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RVA 184339

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Attention: Ian Todhunter, P.Eng.

Re: Village of Alton, Main Street North and Queen Street West EA
Spot Speed Study Data Review

INTRODUCTION

R.V. Anderson Associates Limited (RVA) is currently undertaking the Schedule C Class Environmental Assessment (EA) for Queen Street West from Mississauga Road to Main Street North, herein referred to as “Queen Street,” and for Main Street North from Queen Street to Highpoint Sideroad, herein referred to as “Main Street,” in the Village of Alton, Town of Caledon (the Town). As part of the Class EA, the Town has requested RVA review historical spot speed data for the study area and identify any existing speeding issues along the study area corridors; this letter presents the findings of our review.

METHODOLOGY

Spot speed studies are used to determine the speed distribution of traffic at a specific location, with the collected data used to determine vehicle speed percentiles. The two most common speed percentiles calculated from spot speed data are the 50th and 85th percentiles:

- **The 50th percentile** is the average speed observed, with half of the observed vehicles below and half above the 50th percentile speed.
- **The 85th percentile** is the speed at which 85% of the observed vehicles are travelling at or below. The 85th percentile is typically used in evaluating posted speed limits, as the general assumption is 85% of drivers are travelling at a speed they perceive to be safe, meaning the 85th percentile speed is normally assumed to be the highest safe speed for a roadway section.

The Town has provided RVA with spot speed data for several locations along Main Street and Queen Street within the Class EA study area. A study was completed on Main Street between Mary Street and Nicholas Street, dated May 2018, and four (4) studies were conducted at various locations along Queen Street, dated September 2019.

The spot speed studies were conducted utilizing Automatic Traffic Recorder (ATR) devices, with each ATR deployment consisting of two parallel pneumatic tubes fastened to the roadway surface, measuring the direction of flow, traffic speed, and vehicle classification.

A map illustrating the locations of the observed directional 85th percentile speeds and the existing posted maximum speed limits in the study area, as well as locations of current stop controls for traffic on Main Street and Queen Street, is shown in **Figure 1**.



Figure 1: Observed 85th Percentile Speeds and Posted Speed Limits

PERCENTILE CALCULATIONS

Main Street

The results of the spot speed study conducted on Main Street are summarized in **Table 1**. As shown, the 50th percentile speeds in the northbound and southbound directions are 47 and 48 km/h, respectively, and the 85th percentile speed in both directions is 57 km/h. With an existing posted maximum speed limit on Main Street of 40 km/h, the average observed speed was approximately 7-8 km/h above the posted speed limit, and the 85th percentile speed was 17 km/h above the posted speed limit.

Table 1: Main Street, between Mary Street and Nicholas Street

Date	Day of Week	Northbound Direction		Southbound Direction	
		50 th percentile	85 th percentile	50 th percentile	85 th percentile
07-May-2018	Monday	47	57	48	57
08-May-2018	Tuesday	47	57	48	57
09-May-2018	Wednesday	47	57	48	57
10-May-2018	Thursday	47	56	48	57
11-May-2018	Friday	47	56	48	57
12-May-2018	Saturday	46	56	48	57
13-May-2018	Sunday	47	57	48	57
Average Total		47	57	48	57

Queen Street

The results of the spot speed studies conducted on Queen Street are summarized in **Tables 2-5**. Along most of the corridor, which has a posted maximum speed limit of 40 km/h (John Street to Main Street, Tables 2-4), the 50th percentile speeds ranged from 37-44 km/h, and the 85th percentile speeds ranged from 47-52 km/h. Therefore, the average observed speed generally ranged between 3 km/h below and 4 km/h above the posted speed limit, and the 85th percentile speed 7-12 km/h above the posted speed limit.

Along the westernmost section of the corridor, which has a posted maximum speed limit of 50 km/h (John Street to Mississauga Road, Table 5), the 50th percentile speed was 56 km/h and 55 km/h in the eastbound and westbound directions, respectively, and the 85th percentile speed was 67 km/h and 66 km/h, respectively. Therefore, the average observed speed was approximately 5-6 km/h above the posted speed limit, and the 85th percentile speed was 6-7 km/h above the posted speed limit.

Table 2: Queen Street, between Agnes Street and Victoria Street

Date	Day of Week	Eastbound Direction		Westbound Direction	
		50 th percentile	85 th percentile	50 th percentile	85 th percentile
10-Sept-2019	Tuesday	38	47	39	48
11-Sept-2019	Wednesday	37	47	38	47
12-Sept-2019	Thursday	37	47	38	47
13-Sept-2019	Friday	37	46	37	47
14-Sept-2019	Saturday	37	47	38	47
15-Sept-2019	Sunday	38	47	39	48
16-Sept-2019	Monday	38	47	39	48
Average Total		37	47	38	47

Table 3: Queen Street, between Emeline Street and Agnes Street

Date	Day of Week	Eastbound Direction		Westbound Direction	
		50 th percentile	85 th percentile	50 th percentile	85 th percentile
10-Sept-2019	Tuesday	43	50	44	53
11-Sept-2019	Wednesday	43	50	43	52
12-Sept-2019	Thursday	43	50	43	51
13-Sept-2019	Friday	42	49	44	51
14-Sept-2019	Saturday	43	50	44	52
15-Sept-2019	Sunday	43	49	44	52
16-Sept-2019	Monday	43	49	44	52
Average Total		43	50	44	52

Table 4: Queen Street, between James Street and Emeline Street

Date	Day of Week	Eastbound Direction		Westbound Direction	
		50 th percentile	85 th percentile	50 th percentile	85 th percentile
10-Sept-2019	Tuesday	40	48	38	47
11-Sept-2019	Wednesday	39	47	37	46
12-Sept-2019	Thursday	40	48	37	46
13-Sept-2019	Friday	40	48	37	46
14-Sept-2019	Saturday	40	48	38	47
15-Sept-2019	Sunday	40	48	38	47
16-Sept-2019	Monday	39	47	37	47
Average Total		40	48	37	47

Table 5: Queen Street, between Mississauga Road and John Street

Date	Day of Week	Eastbound Direction		Westbound Direction	
		50 th percentile	85 th percentile	50 th percentile	85 th percentile
10-Sept-2019	Tuesday	56	67	55	66
11-Sept-2019	Wednesday	56	66	55	65
12-Sept-2019	Thursday	57	67	55	67
13-Sept-2019	Friday	57	68	54	66
14-Sept-2019	Saturday	57	68	54	66
15-Sept-2019	Sunday	56	67	55	66
16-Sept-2019	Monday	56	67	55	66
Average Total		56	67	55	66

FINDINGS

As shown in **Table 6**, the results of the spot speed studies can be summarized as follows:

- Operating speeds (85th percentile speed) on Main Street between Mary Street and Nicholas Street are approximately 17 km/h above the 40 km/h posted speed limit;
- Operating speeds along the urbanized portion of Queen Street are approximately 7-12 km/h above the 40 km/h posted speed limit; and
- Operating speeds along the rural portion of Queen Street are approximately 16-17 km/h above the 50 km/h posted speed limit.

Table 6: Summary of Posted Speed Limits vs 85th Percentile Speeds

Location	Posted Speed Limit	Operating Speed (+/- posted speed)	
		Northbound	Southbound
Main Street, between Mary Street and Nicholas Street	40 km/h	+17 km/h	+17 km/h
Queen Street, between Agnes Street and Victoria Street	40 km/h	Eastbound	Westbound
		+7 km/h	+7 km/h
Queen Street, between Emeline Street and Agnes Street	40 km/h	+10 km/h	+12 km/h
Queen Street, between James Street and Emeline Street	40 km/h	+8 km/h	+7 km/h
Queen Street, between Mississauga Road and John Street	50 km/h	+17 km/h	+16 km/h

Main Street

With respect to Main Street, the spot speed study data review identified a notable variance (17 km/h) between the posted speed limit and operating speeds, representing low compliance. Although this section of Main Street is posted 40 km/h, it does currently have a rural cross-section with gravel shoulders, wider roadway width, larger setbacks of buildings from the roadway, and general downgrade in approach to Queen Street, all of which are design features likely contributing to higher operating speeds compared to the urbanized portion of Queen Street. It is noted that the Town has installed some forms of traffic calming, such as pavement markings, signage, and a radar speed sign, which were in place at the time of the spot speed study. These results indicate a posted speed limit of 50 km/h may be more suitable for the driving conditions along this rural section of Main Street.

Queen Street, Mississauga Road to John Street

Similar to the data collected on Main Street, a notable variance (16-17 km/h) between the posted speed limit and operating speeds on the rural portion of Queen Street have been identified, representing low compliance. This section of Queen Street, between Mississauga Road and John Street, is a true rural cross-section, with gravel shoulders, minimal accesses, no stop controls, no fronting buildings, etc., which are justifiable reasons why this portion maintains a higher posted speed limit (50 km/h) compared to the urban area (40 km/h), and are also design features likely contributing to higher operating speeds. These results indicate a posted speed limit of 60 km/h may be more suitable for the driving conditions along this rural section of Queen Street.

Queen Street, John Street to Main Street

The results of spot speed study data review indicate a speeding issue likely does not exist along the urbanized portion of Queen Street within the study area, from John Street to Main Street, with a variance of only 7-12 km/h between the posted speed limit and operating speeds. Existing features such as a narrower roadway width, increased density in driveways and cross-streets, some on-street parking, narrow setbacks of buildings from the roadway, and the all-way stops at James Street North and at Main Street, are all design features likely having a traffic calming effect on motorists.

CONCLUSIONS

It is our opinion the identified operating speeds on the currently urbanized portion of Queen Street are acceptable, with the existing urban cross-section of the roadway acting as a form of traffic calming likely being a major contributing factor to the acceptable compliance to the posted speed limit.

The data indicates lower compliance to the posted speed limits along the currently rural portions of Queen Street (west of John Street) and Main Street, with the existing rural designs of these respective cross-sections likely being primary contributing factors. In lieu of increasing the respective posted speed limits to be more suited to the existing driving conditions, it is expected introducing an urban cross-section as a form of traffic calming, similar to the urban portion of Queen Street, will likely reduce operating speeds and improve compliance.

Proposed EA design alternatives are to include full urbanization of Queen Street in the study area, as well as urbanization of Main Street north of Queen Street (location of transition from urban to rural planned near the vicinity of the Mary Street intersection). Other urban improvements to the corridors, such as sidewalk to be incorporated into the proposed urban cross-sections, strategically located roadside features such as gateway signage for the Village, and potential layby parking on Main Street, are also expected to expand the boundaries of the urbanized Village of Alton.

This expansion of the boundaries of the urbanized Village of Alton is expected to have a traffic calming effect on the overall study area road network, with the anticipation that compliance to the posted speed limits should improve. The Town may choose to complete a follow-up Spot Speed Study upon completion of construction of the proposed road designs in order to re-assess speed compliance and determine if additional traffic calming features are warranted.

CLOSING

If you have any questions requiring clarification, please feel free to contact Adam Mildenberger, Transportation Planner, at 905-685-5019 ext. 4215 or by email at AMildenberger@rvanderson.com

Yours very truly,

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