

COMMITTEE OF THE WHOLE – DECEMBER 3, 2007

VAUGHAN MILLS ROAD OPERATIONAL SAFETY ADDITIONAL REVIEW

Recommendation

The Commissioner of Engineering and Public Works recommends:

1. That this report be received for information;
2. That the draft report entitled “Vaughan Mills Road – Operational Safety Review” by SRM Associates Ltd. dated November 20, 2007, be received;
3. That a community meeting be held at which the consultant’s report would be presented and a consensus reached with area residents on measures to be implemented to address the traffic operational issues in the subject section of Vaughan Mills Road at Humberview Drive; and,
4. That York Regional Police be contacted to provide frequent enforcement of the existing 40 km/h speed limit, specifically in the area north of the Humber River Bridge.

Economic Impact

There will be a cost to be absorbed in the Traffic Calming Capital Budget Account Budget for the traffic calming measure installation. The cost to maintain the traffic calming measures, signs and markings would have an impact to be absorbed in future Operating Budgets.

Communication Plan

A community meeting will be scheduled and invitations sent to the affected residents in the vicinity of Vaughan Mills Road and Humberview Drive.

Purpose

To report on the operational safety review for Vaughan Mills Road between Roselawn Drive and the Humber River Bridge, as provided by a transportation consultant. The consultant was retained to review the traffic operations with specific emphasis on the area near Humberview Drive.

Background - Analysis and Options

The Vaughan Mills Road bridge was opened in December 2002, making Vaughan Mills Road continuous between Rutherford Road and Langstaff Road. Vaughan Mills Road is designed as a feeder roadway with a 23.0 metre right-of-way and a 11.5 metre travel width (one lane per direction). The existing posted speed limit is 40 km/h.

There is an existing raised roadway median from approximately 30 metres north of Humberview Drive to approximately 80 metres north of the Humber River Bridge.

The review is summarized in the report “Vaughan Mills Road – Operational Safety Review” dated November 20, 2007. In the report, the consultant noted:

- that there is a 85% decrease in the number of reported vehicle collisions from 2003 to June 2006;
- that there is a 9% decrease in the traffic volume between 2003 and 2007;

- that the southbound vehicle speed has increased by 5 km/h at the bottom of the hill near the bridge;
- that the northbound vehicle speed has decreased by 3 km/h at the bottom of the hill near the bridge;
- that the installation of an all-way stop control at the intersection of Vaughan Mills Road and Humberview Drive does not meet the Provincial All-way Stop Warrant and is not recommended.

In their review, the consultant identified the following alternative countermeasures that may be considered along Vaughan Mills Road:

1. Upgraded police enforcement.
2. Close the Humber River Bridge, reduce its width or restrict travel direction.
3. Restrict turns at Rutherford Road.
4. Extend existing median, dividing the road.
5. Speed humps.
6. Traffic circle at Humberview Drive.
7. Curb bump-outs to restrict driving lane widths.
8. Crosswalk at Humberview Drive.
9. Roadway centerline and/or edgeline markings in conjunction with pavement reflectors.
10. Grooved edgelines and/or grooves on both sides of the medians to alert motorists.
11. Raised intersection at Humberview Drive.
12. Increased sidewalk setbacks.
13. Improved guidance to motorists such as signing the steep grade for southbound drivers.

It should be recognized that in some cases enforcement is the only effective deterrent to reckless operation of a motor vehicle. In such cases, no amount of engineering can offset a total lack of motorist vigilance. Some of the alternatives can be implemented at a minimal cost such as pavement markings and pavement reflectors. Other major type works such as the construction of a raised intersection, extension of the centre median or a traffic circle are cost restrictive.

Vehicle Speeds:

	Average Speed		85 th percentile Speed	
	Northbound	Southbound	Northbound	Southbound
Vaughan Mills Road South of Roselawn Drive	48 Km/h	49 Km/h	56 Km/h	56 Km/h
Vaughan Mills Road North of Humber Bridge	53 km/h	56 Km/h	62 Km/h	64 Km/h

Traffic Volumes

	Northbound	Southbound
Vaughan Mills Road South of Roselawn Drive	1740	1885
Vaughan Mills Road North of Humber Bridge	1685	1835

All-way Stop

Staff conducted a turning movement count on Wednesday, September 19, 2007, at the intersection of Vaughan Mills Road and Humberview Drive during the morning and afternoon peak time periods of 7:00 a.m. to 9:00 a.m., and 4:00 p.m. to 6:00 p.m. On the day of the traffic

study the weather was clear. The data collected was compared to the Provincial Warrant for All-Way Stop Control with the following results:

•	Warrant 1 – Minimum Vehicular Volumes	Warranted	30%
•	Warrant 2 – Accident Hazard	Warranted	0%
•	Warrant 3 – Sight Restriction	Warranted	0%

All-way stop controls are recommended when one of the above warrants are satisfied to 100% or more. There have been no reported collisions from June 2005 through to June 2006, the last year for which collision data is available. There are no sight restrictions at this intersection. According to the results above, this intersection does not meet the minimum requirements of the warrant.

Collision History

From 2003 to June 2006, there have been two collisions reported to York Regional Police on this section of Vaughan Mills Road. Residents have reported a number of collisions where the driver left the scene and there was no police report of the incident. In early November, 2007, a northbound vehicle travelling at high speed went out of control and hit a light pole. Through complaints from area residents, it appears that this section of roadway is prone to irresponsible drivers travelling at high speed and endangering other motorists, pedestrians and residents.

The Consultant has recommended the following for Vaughan Mills Road:

- * A combination of driver guidance related treatments such as signage and pavement marking in combination with physical traffic calming measures are proposed to achieve reduced traffic speeds.
- * Narrow the lanes from the existing median south to the south end of the Humber River Bridge by placing pavement markings in conjunction with pavement reflectors either offset from the edge of pavement or as a median. Alternately, a mountable centre median could be constructed.
- * Improve guidance to motorists through upgraded signage by adding a 'steep grade' sign just south of Roselawn Drive.
- * Construct a traffic circle at Humberview Drive.

Engineering Services staff in general concur with the recommendations stated in the Consultant's report and recommend exploring the installation of a raised pedestrian crossing at Humberview Drive in place of a traffic circle.

An all-way stop control at Humberview Drive is not recommended. It is unwarranted and its installation may introduce other safety related concerns.

Further to the recommendation of the Consultant's report, Engineering Services staff recommends that 'Pedestrian' warning signs be implemented with flashing beacons in both directions. The recommended "steep grade" warning signs could also be fitted with flashing beacons. Funding for the warning signs and flashing beacons can be drawn from the Traffic Calming Capital Budget Account EN-1607-07.

Relationship to Vaughan Vision 2007

This traffic study is consistent with Vaughan Vision 2007 as to ensure that the enhancement of safety standards are adhered to (1.1.2) and that effective traffic calming measures meet the City's Neighbourhood Policy and Procedures and warrants for traffic calming (3.3.1).

This report is consistent with the priorities previously set by Council.

Regional Implications

Not Applicable.

Conclusion

It is recommended that this report be received for information, and that the draft report entitled "Vaughan Mills Road – Operational Safety Review" by SRM Associates Ltd. dated November 20, 2007, be received.

It is also recommended that a meeting be held with residents of Humberview Drive and the area of Vaughan Mills Road between Roselawn and the bridge to review the findings and alternatives. The intention would be to obtain a consensus from residents on measures to be implemented to address the problem.

Attachments

1. Location Map
2. Draft Report, "Vaughan Mills Road – Operational Safety Review" (Mayor and Members of Council only)

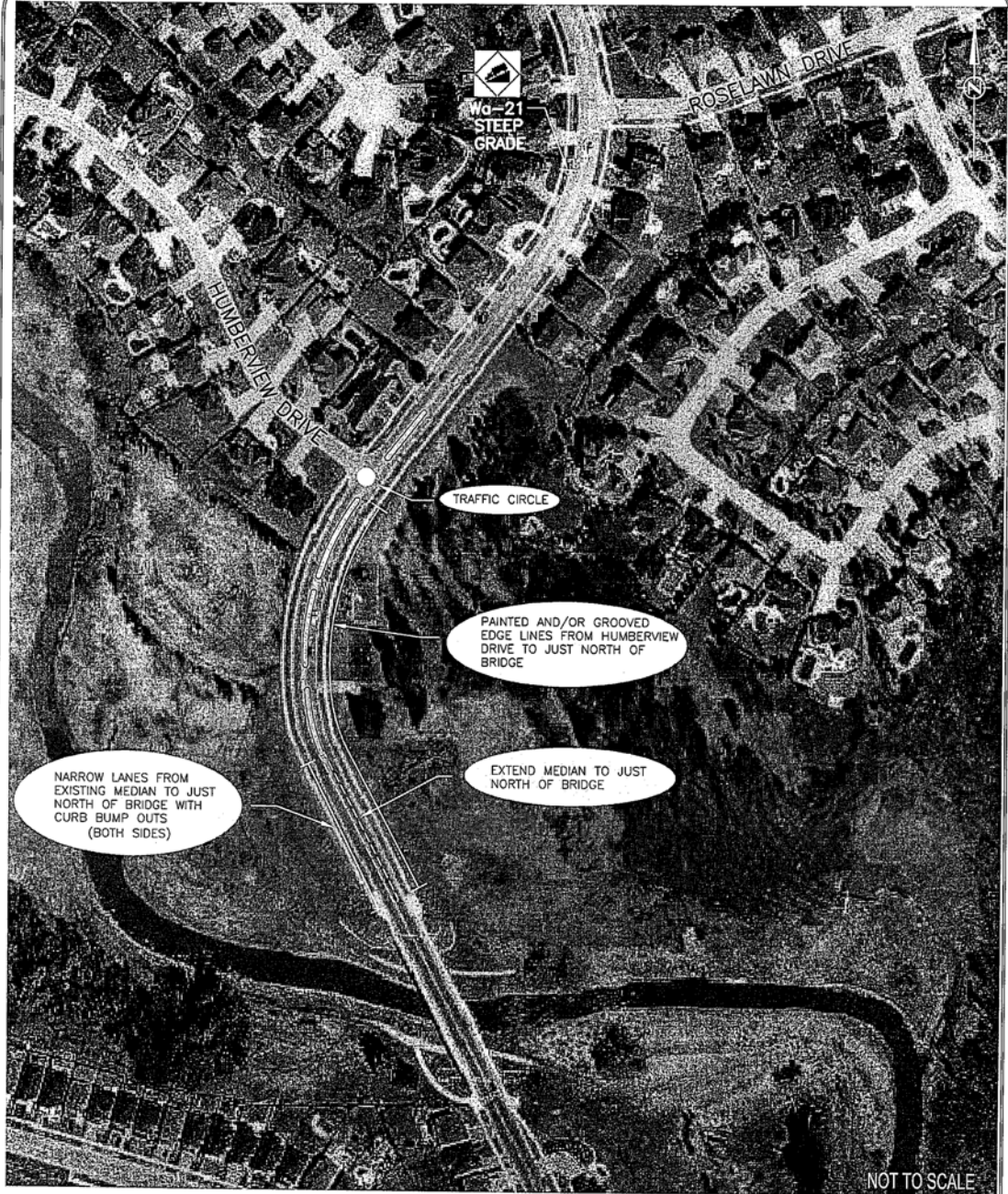
Report prepared by

Leslie Winfrow – Senior Traffic Technologist, ext. 3131
Mike Dokman – Supervisor, Traffic Engineering, ext. 3118

Respectfully submitted,

Bill Robinson, P. Eng.
Commissioner of Engineering and Public Works

ATTACHMENT NO. 1



SERNAS TRANSTECH



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Lakewood, CO 80401
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VAUGHAN MILLS ROAD

Figure 1

ATTACHMENT NO. 2

November 20, 2007

City of Vaughan
Engineering Department
2141 Major Mackenzie Drive
Vaughan, Ontario
L6A 1T1

Attention: Mr. Mike Dokman
Supervisor, Traffic Engineering

Dear Mr. Dokman:

**Re: Vaughan Mills Road
Operational Safety Review
City of Vaughan
Our Project No. PP1307064**

INTRODUCTION

We are pleased to submit our findings of an Operational Safety Review of Vaughan Mills Road between the Humber River Bridge and Roselawn Drive. In June 2003, we submitted an Operational Safety Review of Vaughan Mills Road between Langstaff Road and Roselawn Drive. This was in response to concerns, primarily about speed, since the opening of the Humber River Bridge in December 2002. Subsequent to this study, several safety measures that were recommended in the study were implemented by the City of Vaughan (the City). They are summarized as follows:

- Speed hump at the south end of the Humber River Bridge.
- Center medians starting from 35m north of Humberview Drive to 80m north of the Humber River Bridge abutment.
- Several curve warning signs for northbound and southbound traffic.
- "Bridge Ices" signage for northbound and southbound traffic.

Subsequent to the implementation of these safety measures, complaints of excessive speed have continued to be submitted to the City by area residents. In addition, all-way stop sign control has been requested at the intersection of Humberview Drive to control speed.

This report summarizes current conditions, compares them to our findings in 2003, identifies alternative safety measures and recommends solutions to the traffic related concerns occurring along the subject section of Vaughan Mills Road.

OUR FINDINGS

We have completed a review of current volume, speed, and classification counts and a cut-through study conducted by the City in October 2007. We have also reviewed a collision history for the subject section of roadway between 2003 and 2007 provided by the City. **Table 1** summarizes a comparison of current data with data gathered for the previous study in 2003. A classification count and cut-through study was not conducted in 2003. This data has been shown for information purposes.

**Table 1
 Study Comparison**

Data	2003	2007	Change
Two Way Vehicle Volume on Vaughan Mills Road	4,375	3,991	9% Decrease
85 th Percentile Speed (south of Roselawn Drive – close to top of hill)	Not Studied	Northbound – 56 km/h	NA
	Not Studied	Southbound - 56 km/h	NA
85 th Percentile Speed (north of bridge – bottom of hill)	Northbound - 65 km/h	Northbound – 62 km/h	3 km/h Decrease
	Southbound - 59 km/h	Southbound - 64 km/h	5 km/h Increase
Collision History	Previous 1 year (2002) = 4 = An Average of 4 per year	Previous 3.5 years* = 2 = An Average of 0.6 per year	85% Decrease
Trucks	Not Studied	7%	NA
Cut-Through (Percent of non-neighbourhood traffic)	Not Studied	AM Peak Hour = 37%	NA
	Not Studied	PM Peak Hour = 22%	NA

*Data from 2003 to June 2006. Collision data currently unavailable after June 2006.

Traffic Volume

The City gathered directional traffic volumes over a 7 day period on Vaughan Mills Road. The results indicate a 9% decrease in traffic volume since 2003. It is unknown whether this is an actual annual decrease or seasonal variation. It can be concluded that volumes have not increased on Vaughan Mills Road since 2003 and may have decreased slightly.

Speed

There has been a 3 km/h decrease in the 85thile traffic speeds for northbound traffic and a 5 km/h increase for southbound traffic at the "bottom of the hill" on Vaughan Mills Road since 2003. Near the "top of the hill" the 85thile speeds in 2007 were recorded at 56 km/h for both directions of traffic. This location was not studied in 2003. It can be concluded that the centre medians may be contributing to the northbound decrease and the lower speeds further up the hill, but have not discouraged southbound speeding.

The recorded speeds between Humberview Drive and Roselawn Drive are consistent with this class of roadway. It is accepted engineering practice to set speed limits based upon the 85th percentile speed. In this regard, it appears that the subject roadway should have a posted speed limit of 50 km/h over its entire length (not the existing 40 km/h speed limit) which is consistent with common practice for residential streets throughout the City of Vaughan and other area jurisdictions. Traffic calming measures should only be introduced where the recorded 85th percentile speed exceeds 10-15 km/h (or more) over the suggested speed limit.

Cut Thru Traffic

Vaughan Mills Road, within the subject section is relatively unique because it traverses the Humber River Valley. The winding and steep design characteristics of the roadway alignment are uncommon characteristics of most urban residential neighbourhoods. This became evident as the field investigations revealed previously noted high speeds on the steep curved roadway section. Some have attributed the high traffic volumes to infiltrating traffic. A study was conducted to investigate this.

Results show that during the AM peak hour 37% of traffic originates from and is destined to outside the neighbourhood. In other words this traffic can be considered non-neighbourhood traffic or cut-through traffic. During PM peak hour the cut-thru is 22%.

This cut-thru traffic may be due to the limitations of the existing wider area road network. Vaughan Mills Road is the only alternative north-south connection to Highway 27 to the west and Islington Avenue to the east, between Langstaff Road/Kipling Avenue and Rutherford Road. One other less desirable connection exists as Clarence Street but it has a circuitous, indirect connection between the two east-west streets.

Collision History

There have been 2 collisions along the subject section of Vaughan Mills Road since 2003. This represents a dramatic reduction of 85% in collisions since 2003. Both collisions occurred during the day and involved drivers losing control in wet or snowy conditions. This would indicate that, despite the continued occurrence of relatively high speeds, the majority of drivers are adequately navigating the hill and curve.

All-Way Stop at Humberview Drive

A warrant analysis for all-way stop control at the intersection of Humberview Drive was conducted by City staff. The warrant was not met based upon current conditions (traffic volumes, etc.). The following negative impacts/effects are associated with unwarranted or unnecessary stop sign installations:

- Results in compliance problems and increased conflicts
- Traffic rarely comes to a full stop when side street volumes are low
- Motorists increase their speed between stop signs to make up for lost time resulting in increases in the roadway's average (50th percentile) operating speed
- Residents and pedestrians gain a false sense of security

- Negative environmental impacts, i.e. increased emissions, increase in fuel consumption and noise generated by braking and acceleration

It should be noted that All-Way stop sign controls disrupt the flow of traffic and introduce delays to all drivers within the intersection and should be only considered at the intersection of two roadways having similar traffic volume demand and operating characteristics. The Ontario Traffic Manual states that all-way stop control should not be used under the following conditions:

- As a speed control device
- As a means of deterring the movement of through traffic in a residential area
- Where the protection of pedestrians, school children in particular, is a prime concern (this concern can usually be addressed by other means)
- Where visibility of the sign is hampered by curves or grades, and insufficient safe stopping distance exists
- On truck or bus routes, except in an industrial area or where two such routes cross
- Where any other traffic device controlling right-of-way is permanently in place within 250m, with the exception of a Yield sign

Observed Conditions

The following observations of traffic operations and the road environment were made after a field visit. Some of these observations are a repeat of observations made in 2003. These duplications are marked with an asterisk (*).

- Absence of roadway banking or pavement superelevation in the curve south of Humberview Drive.*
- Absence of stop control spacing consistent with other intersection spacing elsewhere along Vaughan Mills Road, i.e. the subject section of roadway represents the first long stretch of uninterrupted roadway. If not for the steep grade and curve, the problem would not be of as much concern.*
- A steeper grade on Vaughan Mills Road at Humberview Drive than anywhere else in the subdivision.*
- The width of pavement at 11.5m on Vaughan Mills Road south of the median contributes to excess speed.* Vaughan Mills Road is classed as a Primary Road and has a pavement width that conforms to the City's standard width for that class of roadway. It is our opinion that the higher speeds recorded south of the end of the median are due to the absence of visual cues to the driver such as driveways, homes and narrower pavement up to just south of the bridge where homes begin to appear again. This visually "open" section of roadway gives the driver a false sense of security in that they do not expect vehicles entering the roadway from driveways or pedestrians crossing between homes and are comfortable increasing their speed.
- Absence of a steep grade sign consistent with the absence of banked roadway through the curve where average operating speed exceeds the curve design.

- The roadway centerline marking could be more visible if placed in conjunction with pavement reflectors.

Through a thorough evaluation of roadway conditions and a comparison to roads of similar classification, it is readily evident that the subject section of Vaughan Mills Road requires further traffic calming measures.

POSSIBLE ALTERNATIVE COUNTERMEASURES

The following alternative speed and safety countermeasures were evaluated as possible solutions to the above documented problems.

- Upgraded police enforcement
- Close the Humber River Bridge, reduce its width or restrict travel direction
- Restrict turns at Rutherford Road
- Extend existing median dividing the road
- Speed humps
- Traffic circle at Humberview Drive
- Curb bump-outs to restrict driving lane widths
- Crosswalk at Humberview Drive
- Roadway centerline and/or edgeline markings placed in conjunction with pavement reflectors
- Grooved edgelines and/or grooves on both sides of the medians to alert motorists
- Raised intersection at Humberview Drive
- Increased sidewalk setbacks
- Improve guidance to motorists such as signing the steep grade for southbound drivers. The grade at Humberview Drive on Vaughan Mills Road is greater than 6%.

EVALUATION OF COUNTERMEASURES AND DISCUSSION

The optimal solution is one that has the greatest influence on speed with the least impact to the community and is cost-effective. The process of determining the optimal solution is mostly qualitative except where based on results of before and after studies comparing speed reduction effectiveness, e.g. speed humps or regular police enforcement. The sensitivity of each criterion determines the importance given to it during the evaluation. We evaluated the following factors listed below and qualitatively ranked them according to importance.

- Effectiveness in speed reduction
- Pedestrian friendliness
- Traffic noise
- Cost
- Driveway access improvement
- Concern for loss of parking
- Traffic efficiency
- Impact to emergency response times

- Aesthetics

An evaluation of all the alternative countermeasures (noted on the previous page) using the above listed criteria yielded a ranking of possible solutions and the elimination of others.

The solutions are listed in **Table 2** in descending order, starting with the most preferred based on the degree to which each solution addresses the factors identified. Several solutions can be combined to produce the overall desired changes on Vaughan Mills Road. Comments on the suitability of each solution in terms of impact or mitigation potential are also provided.

Table 2
Solutions

Solutions Listed in Order of Preference	Comments on Evaluation
1. Roadway centerline or edgeline markings placed in conjunction with pavement reflectors to reduce driving lane width.	Measures including pavement marking upgrades are implementable at low cost.
2a. Upgraded police enforcement.	Police enforcement is cost effective but requires regular long term commitment.
2b. Curb bump-outs to restrict driving lane widths.	Curb bump-outs are costly and impede parking and snow clearing.
3. Extend the existing median dividing the road to the south to the south end of the Humber River Bridge.	A median is costly and impacts maintenance.
4a. Grooved medians or edge lines to alert motorists.	Grooved medians are excessively noisy.
4b. Narrow the lanes by placing a nearly flush mountable concrete median from Humberview Drive southerly to the Humber River crossing.	A median is costly and impacts maintenance.
4c. Traffic circle at Humberview Drive	Can be costly. Existing curb and median may have to be adjusted.

Recommendations:

A combination of driver guidance related treatments such as signage and pavement markings in combination with physical traffic calming measures are proposed to achieve reduced traffic speeds.

An all-way stop control at Humberview Drive is not recommended. It is unwarranted and its installation may introduce other safety related concerns.

We recommend the following combination of guidance related treatments and traffic calming devices. The recommended combination of measures is as follows:

1. Narrow the lanes from the existing median south to the south end of the Humber River Bridge by placing pavement markings in conjunction with pavement reflectors either offset from the edge of pavement or as a median. Alternatively, a nearly flush (mountable) concrete median could be constructed. The recorded increase in

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Mike Dokman
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speeding is occurring south of this median where the roadway "open's up". This extension may contribute to the traffic calming effect that appears to be occurring to the north where the median exists.

2. Improve guidance to motorists through upgraded signage by adding a "steep grade" sign just south of Roselawn Drive.
3. Construct a traffic circle at Humberview Drive.

These recommendations are illustrated in Figure 1.

Conclusions:

Recorded speeds north of Humberview Drive are consistent with typical primary residential streets and are not considered excessive. Recorded speeds appear to be excessive at the bottom of the hill just north of the Humber River Bridge. Traffic calming measures should be implemented to address these concerns.

An all-way stop is not an effective means of controlling speed and may introduce other safety issues.

Elsewhere, the recommended measures have been proven effective to influence the majority of competent drivers; however, it should be recognized that in some cases enforcement is the only effective deterrent to reckless operation of a motor vehicle. In such cases, no amount of engineering can offset a total lack of driver vigilance. Apart from the design requirements associated with the additional speed hump, the majority of treatments can be implemented almost immediately and at minimal cost.

Should you require clarification on any of the contents of this report please do not hesitate to contact the undersigned at (905) 686-6402.

Yours truly,

SRM ASSOCIATES

Dave W. Angelakis
Associate, Senior Project Manager

