SUBJECT: Use of Transverse Rumble Strips in Rural Areas (PW09031) - (City Wide) Public Works Outstanding Business List

RECOMMENDATION:

(a) That the Transportation Association of Canada (TAC) “Best Practice Guidelines for the Design and Application of Transverse Rumble Strips (TRS)” be endorsed as the City of Hamilton standard for use at stop signs;

(b) That the item relating to “Rural Stop Sign Safety” be removed from the Public Works Outstanding Business List.

EXECUTIVE SUMMARY:

At the Public Works Committee meeting of May 26, 2008, staff was directed to investigate the use of transverse rumble strips as a safety measure on the approaches to stop controlled intersections in rural areas. Staff was to report back to the Public Works Committee with the results.

The Transportation Association of Canada (TAC) published Best Practice Guidelines for the Design and Application of Transverse Rumble Strips (TRS) in July 2005. It provides a national guidance on the effective use of TRS. While TRS can be used to alert drivers of imminent changes in the driving conditions such as approaches to signalized intersections, stop controlled intersections, yield controlled intersections, one lane bridges, railway crossings, ferry crossings and toll plazas, the City intends to limit the use of these devices for approaches to stop controlled intersections only. Research
studies have illustrated that TRS are effective as an audible attention arising device and believed to enhance driver awareness of traffic control devices.

The TAC publication was developed after an extensive review of current practices and existing research studies on the application and performance of TRS in Canadian and American jurisdictions; therefore, it is recommended that this publication be endorsed as the City of Hamilton standard for use at stop signs.

**BACKGROUND:**

The information/recommendation contained within this report has city wide implications.

At the Public Works Committee meeting of May 26, 2008, staff was directed to investigate the use of Transverse Rumble Strips (TRS) as a safety measure on the approaches to stop controlled intersections in rural areas.

This investigation was initiated after Councillor Dave Mitchell (Ward 11) received an email from a constituent with respect to stop sign safety on rural roads in general and the use of rumble strips. Councillor Dave Mitchell tabled a motion at City Council, which was referred to staff for further investigation and for a report to the Public Works Committee.

The Transportation Association of Canada (TAC) published *Best Practice Guidelines for the Design and Application of Transverse Rumble Strips* in July 2005. It provides a national guidance on the effective use of TRS. The TAC Guide defines *transverse rumble strip as a lateral pattern of grooves or raised pavement material that vertically deflects wheels of a vehicle driving over them thereby producing both noise and vibration.* While TRS treatments can be used to alert motorists to an imminent change in the driving environment that requires greater attention and a speed adaptation, such as approaches to stop controlled intersections, signalized and un-signalized intersections and roundabouts, approaches to sharp horizontal curves, approaches to work zones, and within rural and urban speed transition zones, the City intends to limit the use of these devices for approaches to stop controlled intersections only.

Quantifying the effects of TRS based on a review of past research is difficult due to the variability in research methodology that has been applied, the number of TRS design variations that have been studied, and the number of different road environments that have been studied therein. While far from conclusive, the research collectively yields several key findings.

The TAC publication summarizes key research findings some of which are listed below:

- On an overall basis, the effectiveness of TRS on the motorist's speed reduction ranged from minimal to no effect. There was no statistical significant speed reduction and when comparing the numerous studies the results are inconclusive.
- With the installation of full lane rumble strips, drivers do brake more and earlier, which could result in greater compliance of traffic control devices at intersections. Thus, TRS should always be used in conjunction with other traffic control measures, such as warning beacons, additional signage, etc.
- TRS were cost prohibitive when weighed against their effect on speed.
The effect of TRS diminishes with decreasing average operating speed, thus TRS has a greater effect in areas with higher posted speed limits.

TRS is effective in reducing collision injury collisions when specifically analyzing target collisions.

The TAC publication “Best Practice Guidelines for the Design and Application of Transverse Rumble Strips (TRS) has suggested a warrant system for considering TRS installation at stop controlled intersections. It requires all warrant attributes to be met before TRS installation can be considered for any site.

The warrant for installation of TRS at stop controlled intersections lists the following attributes:

- Posted speed 80 km/h or greater.
- Historic trend of collisions caused by failure to obey the stop sign.
- The subject intersection is not located within 200 m. of a residential area.

TAC guidelines discourage the widespread use of TRS and add that, “There is no conclusive justification for a network or system wide use of transverse rumble strips, and professionals are in agreement that overusing TRS would be detrimental to the overall effectiveness of TRS. Locations where there is a documented collision overrepresentation and where conventional warning methods, such as signs and signals, are inadequate, could be considered for TRS installation”.

The most prominent environmental issue is noise. The TAC guidelines notes that results of the 2004 TRS survey conducted by iTRANS revealed that 60 percent of the road authorities have experienced negative public feedback because of the noise they created. To mitigate for this factor, the report has recommended that TRS should not be installed at intersections within 200m of a residential area. If endorsed, these standards will be applied on a request and/or complaint driven basis where all the warrants are satisfied.

**ANALYSIS/RATIONALE:**

The recommendation is in accordance with TAC guidelines, which are based on evaluation of current practices adopted internationally and on extensive research conducted internationally on this subject.

**ALTERNATIVES FOR CONSIDERATION:**

The Status Quo is an option but staff does not support this approach as there are no clear guidelines or standards for staff to properly investigate and assess possible rumble strip installation locations. Staff could develop their own policy on the application of Transverse Rumble Strips but this is not recommended as the research and analysis that went into the development of the TAC guidelines was extensive and thorough.

**FINANCIAL/STAFFING/LEGAL IMPLICATIONS:**

Since the method of review will be on request/complaint driven basis, we do not anticipate many installations every year such that the costs can be covered through current capital accounts.
POLICIES AFFECTING PROPOSAL:

The Public Works Strategic Plan, “Innovate Now”, identifies our Vision “to be recognized as the centre of environmental and innovative excellence in Canada”. Innovate Now identified seventeen top priorities to move us forward within four vision drivers. This proposal is consistent with “Communities” vision driver as well as one of its top priorities to be a leader in the “greening” and stewardship of the City by virtue of providing safer and more efficient methods of traffic control at the locations with high collision rates.

RELEVANT CONSULTATION:

Councillor Dave Mitchell has advised that he supports this proposed initiative.

CITY STRATEGIC COMMITMENT:

By evaluating the “Triple Bottom Line”, (community, environment, economic implications) we can make choices that create value across all three bottom lines, moving us closer to our vision for a sustainable community, and Provincial interests.

Community Well-Being is enhanced. ☑ Yes ☐ No
Installation of Transverse Rumble Strips will reduce the risk of collisions at potential locations including stop controlled intersections.

Environmental Well-Being is enhanced. ☐ Yes ☑ No

Economic Well-Being is enhanced. ☐ Yes ☑ No

Does the option you are recommending create value across all three bottom lines? ☐ Yes ☑ No

Do the options you are recommending make Hamilton a City of choice for high performance public servants? ☐ Yes ☑ No