



City of
Peterborough

To: Members of the General Committee

From: W.H. Jackson, Director of Utility Services

Meeting Date: February 26, 2018

Subject: Report USTR18-003
Raymond Street / Westdale Avenue Traffic Operational Review

Purpose

A report to present the findings and recommendations from the Raymond Street / Westdale Avenue Traffic Operational Review.

Recommendations

That Council approve the recommendations outlined in Report USTR18-003 dated February 26, 2018, of the Director of Utility Services, as follows:

- a) That Stop control be implemented on Raymond Street at Westdale Avenue; and
- b) That a 2018 Capital Budget be created in the amount of \$35,000 for the Design and Construction of Improvements to the intersection of Raymond Street and Westdale Avenue as shown in Appendix B to Report USTR18-003 to be funded from the uncommitted balance in the 2018 Capital Budget for Traffic Improvements (Project 5-13-04).

Budget and Financial Implications

The estimated cost to implement the recommended curb, sign and pavement marking improvements is \$35,000, including \$5,000 for engineering design, contract administration, inspection and a \$5,000 contingency. Funds for all of the proposed works are available in the uncommitted balance in the 2018 Capital Budget for Traffic Improvements (Project 5-13.04).

Background

In response to resident concerns, staff conducted a Traffic Operational Review of the intersection of Raymond Street and Westdale Avenue with respect to the need for additional intersection control. Residents expressed concerns with the number of near miss collisions occurring at the intersection.

Site Details

Raymond Street is a local road that serves mainly neighbourhood traffic. Raymond Street extends from Fairbairn Street, in the west, to a cul-de-sac approximately 500 m east of Westdale Avenue. In 2013, Raymond Street was extended east to accommodate the construction of an additional 60 new homes, resulting in an increase in traffic on Raymond Street. Raymond Street has a speed limit of 50 km/h and there are no sidewalks in the vicinity of Westdale Avenue.

Westdale Avenue is a short local road which connects Raymond Street in the south to Hillside Street in the north. There is a cul-de-sac, Cochrane Crescent, containing approximately 19 houses off of Westdale Avenue, halfway between Raymond Street and Hillside Street. Westdale Avenue has a speed limit of 50 km/h and does not have any sidewalks.

Westdale Avenue intersects Raymond Street from the north to create a non-typical “Y” intersection as shown in Appendix A. There is currently no intersection control at the intersection of Raymond Street and Westdale Avenue and drivers are expected to observe the right-hand rule when entering the intersection. The right-hand rule under the Highway Traffic Act, dictates that when two vehicles enter an uncontrolled intersection at the same time, the driver on the left shall yield the right-of-way to the driver on the right. An example would be if a southbound driver on Westdale Avenue and an eastbound driver on Raymond Street were to approach the intersection at the same time, the southbound driver would have to yield the right-of-way to the eastbound driver, as the eastbound driver would be approaching on the southbound driver’s right-hand side.

Traffic Operational Review

The traffic operational review consisted of the following data collection and analysis:

- Vehicle Volume
- Vehicle Speed Study
- Collision History
- Sight Line Review
- All-Way Stop Analysis
- Site Observations

Vehicle Volume

A vehicle volume count was conducted at Raymond Street and Westdale Avenue during a typical weekday for a 12-hour period, from 7:00 AM until 7:00 PM. A total of 554 vehicles were recorded during the 12-hour period, which is considered low for local roads in the City of Peterborough. Of the 554 vehicles observed, 360 vehicles (65%) were travelling eastbound/westbound on Raymond Street. A total of 101 vehicles (18%) were travelling from Raymond Street and turning onto Westdale Avenue, and the remaining 93 vehicles (17%) came from Westdale Avenue and turned either left or right onto Raymond Street.

Vehicle Speed Study

The speed limit on both Raymond Street and Westdale Avenue is 50 km/h. Vehicle speed studies were conducted for eastbound and westbound vehicles on Raymond Street, and for northbound and southbound vehicles on Westdale Avenue. It was found that 85% of drivers travelled at 35 km/h or below on Raymond Street, with a median observed speed of 27 km/h. On Westdale Avenue, 85% of drivers were found to be travelling at 38 km/h or below, with a median observed speed of 31 km/h.

Collision History

There were no reported collisions in the past three years at the intersection of Raymond Street and Westdale Avenue. There were two collisions reported on Raymond Street between Westdale Avenue and Hemlock Street. Of the two reported collisions, one collision was the result of a driver backing into a parked car while backing out of a driveway, and the second collision was the result of inclement weather.

Sight Line Review

Stopping sight distances were measured for vehicles approaching the intersection. Stopping sight distances for vehicles travelling southbound on Westdale Avenue were found to meet Transportation Association of Canada (TAC) guidelines. Stopping sight distances for vehicles travelling eastbound and westbound on Raymond Street were found to meet TAC minimum guidelines at operational speeds (85th percentile speed of 35 km/h), but failed to meet the minimum guideline distance at the speed limit (50 km/h).

Sightline distances were measured and found to be below minimum TAC guidelines for all approaches. The front yard of the property on the south side of the intersection is elevated, making it difficult for vehicles travelling eastbound and westbound on Raymond Street to see vehicles approaching from the opposite direction. In addition, the abundance of trees, bushes, and vehicles parked on Raymond Street west of Westdale Avenue result in reduced sightlines on all approaches.

All-way Stop Analysis

The key factors used to assess the need for the implementation of all-way stop control include: collision experience, minimum vehicle volume, and traffic flow. The technical justification for the installation of an all-way stop is broken down into two warrants, Minimum Vehicle Volume Warrant and Collision Warrant. The Minimum Vehicle Volume Warrant requires a minimum of 350 vehicles entering the intersection for the peak hour of the day and the vehicle volume on the major road must be less than 65% of the total traffic volume entering the intersection. The Collision Warrant requires an average of four or more collisions per year over a three year period that involve side street traffic failing to yield to through street traffic.

An all-way stop is not warranted at this intersection as the peak hour traffic volume is only 61 vehicles, and no accidents were reported at the intersection the past.

Site Observations

Staff visited the area on several occasions to gather data and better assess the existing environmental conditions and driver behavior. During these visits, staff observed multiple instances where drivers appeared uncertain about how they were expected to proceed through the intersection, with the majority of these instances involving drivers travelling to and from Westdale Avenue. In contrast, staff also observed instances of drivers who travelled through the intersection at higher speeds, typically travelling eastbound-westbound on Raymond Street. The interaction of these two types of drivers; those who are likely familiar with the area and those who are not, has the potential to cause conflict, as drivers may not be able to reliably predict how the other drivers will react. Staff also observed several instances of westbound drivers travelling through the intersection by cutting into the eastbound lane, as well as eastbound drivers taking wide left-hand turns onto Westdale Avenue. This driver behavior combined with poor sight lines increase the potential for conflicts between eastbound and westbound drivers.

Discussion

The Traffic Operational Review revealed low vehicle volumes (554 vehicles over a 12-hour period) on both Raymond Street and Westdale Avenue, vehicle speeds which are well below the speed limit of 50 km/h (85th percentile speed of 35 km/h on Raymond Street and 38 km/h on Westdale Avenue), and no pattern of collisions at the intersection of Raymond Street and Westdale Avenue.

The sight line review identified stopping sight distances for vehicles travelling on Raymond Street at the posted speed limit exceed the minimum requirements set out by the TAC guidelines. In addition, the sight lines on all intersection approaches are restricted by the curve in the road, trees on the south and west sides of the intersection, and an elevated lawn on the south side of the intersection. The corrective measure for this condition is to provide drivers with advance warning of the upcoming intersection by installing an "Intersection ahead" warning sign. This type of sign will also clearly identify

who has the right-of-way through the intersection for drivers who are unfamiliar with area.

The extension of Raymond Street with the addition of 60 new homes has increased traffic volumes through the Raymond Street / Westdale Avenue intersection. Based on the Ontario Traffic Manual Book 5 - Regulatory Signs, a stop sign may be considered at an intersection where the application of the normal right-hand rule would be unduly hazardous. Although the collision history does not show this intersection to be unduly hazardous, staff observations identified driver uncertainty/hesitation when negotiating the intersection supporting resident reports of near miss collisions. The installation of yellow dividing lines and a stop sign on Raymond Street on the westbound approach clearly defines the right-of-way through the intersection. Given the unusual geometry and resulting traffic operations from only one leg of the intersection being under stop sign control, additional signage will be considered to ensure drivers are aware of the specific operation of this intersection.

The non-typical “Y” intersection geometry creates a large radius on the south side of Raymond Street through the intersection. This extra road width encourages westbound drivers travelling through the intersection to cut the corner into the eastbound lane, as well as eastbound drivers taking wide left-hand turns onto Westdale Avenue. To improve the geometry of the intersection, staff is of the opinion that the south curb line should be re-aligned to reduce the existing radius and narrow the pavement width. These geometric changes along with implementation of the stop sign on Raymond Street, yellow dividing line pavement markings, and intersection warning signs will encourage slower speeds and improve guidance through the intersection. A concept drawing of the recommended improvements is shown in Appendix B.

Through this report it is recommended that these improvements be incorporated into the Engineering and Construction Division work program for implementation during the 2018 construction season.

Timelines

If the recommendations are approved, detailed design and construction of the intersection improvement concept plan will be scheduled for 2018.

Summary

The Raymond Street / Westdale Avenue Traffic Operational Review has shown that vehicle speed, vehicle volume, and collision history is typical of a local residential intersection within the City of Peterborough. Despite this, a review of sight lines, stopping sight distance and driver behaviour supports the need for right-of-way control. As a result, staff recommends the implementation a stop sign on Raymond Street on the east leg of the intersection for westbound traffic; yellow dividing line pavement markings on Raymond Street and Westdale Avenue; the re-alignment of the curb on the

south side of the intersection and; the installation of intersection warning signs to increase driver awareness and reduce the number of near miss collisions.

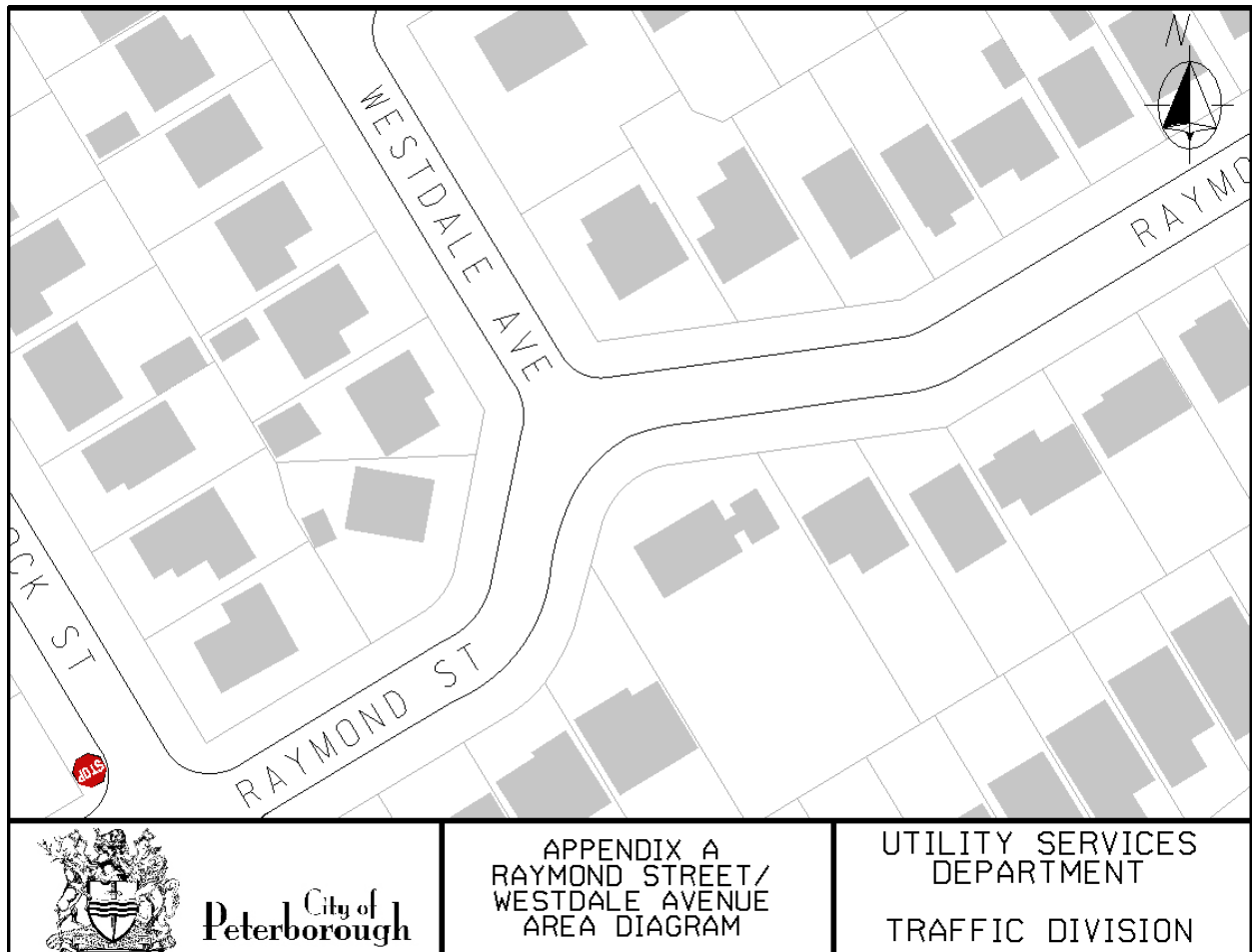
Submitted by,

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Attachments:
Appendix A Area Diagram
Appendix B Concept Sketch

APPENDIX A – EXISTING AREA DIAGRAM



APPENDIX B – CONCEPT SKETCH

