



City of
Peterborough

To: Members of the Committee of the Whole

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

Meeting Date: September 25, 2017

Subject: Report USTR17-016
Hunter Street West / Bethune Street All-way Stop Control

Purpose

A report to recommend the implementation of all-way stop control at the intersection of Hunter Street West and Bethune Street.

Recommendation

That Council approve the recommendation outlined in Report USTR17-016 dated September 25, 2017, of the Director of Utility Services, as follows:

That All-way Stop Control be implemented at the intersection of Hunter Street West and Bethune Street.

Budget and Financial Implications

The implementation of the all-way stop signs and pavement markings will cost approximately \$3,000, funds for which are available in the uncommitted balance in the 2017 Capital Budget for Traffic Improvements (Project Reference 5-13.04).

Background

In response to resident concerns, staff undertook a traffic operational review of the intersection of Hunter Street West and Bethune Street with respect to the need for all-way stop control.

Site Details

Hunter Street West is a two-lane low capacity arterial road running east-west from the City's Old West End neighbourhood to Water Street in the downtown. This section of Hunter Street is a connecting link between Rubidge Street and Aylmer Street and serves a mix of medium density residential and light commercial properties. Hunter Street has an urban cross-section with a pavement width of approximately 10 metres and sidewalks on both sides of the street. There are two commercial businesses at the intersection, The Eco Laundry Room on the northwest corner and Fitzgerald Fuels on the southeast corner.

Bethune Street is a two-lane low capacity collector road running north-south from Wolsely Street to Wolfe Street through a mixed residential / commercial area. The road cross-section is approximately 13.5 metres wide with curb-face sidewalks on the west side of the street.

The speed limit on Hunter Street West and Bethune Street is 50km/h.

In concert with Jackson Creek Flood Diversion Sewer Improvements the Bethune Street corridor from Dalhousie Street to Dublin Street is currently undergoing detail design for streetscape and public realm. The Bethune Street Project is proposed to include enhanced cycling and pedestrian infrastructure as well as restrict vehicle access on Bethune Street. Upon completion of the Bethune Street Project, Bethune Street south of Hunter Street will be restricted to pedestrian and cyclists only and Bethune Street north of Hunter Street will be a bicycle priority street with limited vehicle access.

Bethune Street construction will commence mid 2018 near Dalhousie Street and will work it's way north. Based on construction estimates and schedules, it is anticipated construction work surrounding Hunter Street will not commence until mid-late 2019.

A sketch of the subject area is shown in Appendix A.

Traffic Operational Review

The traffic operational review included the following data collection and analysis:

- Vehicle volume,
- Collision history,
- Sight line measurements and;
- Site observations.

Vehicle Volume

Hunter Street West has approximately 9,900 vehicles per day while Bethune Street carries 2,000 vehicles per day. The Transportation Association of Canada (TAC) guidelines suggest that 5,000 – 20,000 vehicles per day is typical for the average daily volume on a minor arterial road and less than 8,000 vehicles per day for a residential collector road. While the City does not undertake annual traffic counts on every arterial road, there have been a number of counts done as part of other studies that suggest many other arterial roads in residential areas of Peterborough have traffic volumes within this range. A few examples include Rubidge Street (7,850 / day), Reid Street (6,640 / day), McDonnell Street (7,180 / day), Cumberland Avenue (4,720 / day) and Nassau Mills Road (5,780 / day). The average daily volume on Hunter Street West and Bethune Street are within the TAC guidelines and is typical of other arterial and collector roads in the City.

Collision History

In the past 3 years there have been eighteen reported collisions within the intersection of Hunter Street West and Bethune Street. Of the eighteen collisions, three collisions resulted in personal injury and thirteen collisions had property damage exceeding \$2,000.

Sight Line Review

Stopping sight distances were measured for vehicles travelling eastbound and westbound on Hunter Street approaching the intersection. Sight line distances were measured for vehicles stopped on Bethune Street waiting to cross or turning onto Hunter Street.

The stopping sight distance is the minimum distance required for a driver to perceive the need to stop plus the reaction and deceleration time to bring the vehicle to a complete stop for the prevailing operating speed. The measured stopping sight distance for vehicles travelling eastbound and westbound on Hunter Street meet the minimum requirements set out by the TAC design guidelines.

The sight line distance is the minimum distance required for a driver stopped on the side road to perceive a gap in traffic plus the reaction and acceleration time necessary to

cross the intersection or turn onto the intersecting roadway and then accelerate to the normal operating speed without interfering with through traffic. The review of sight line distances for vehicles turning from the north and south leg of Bethune Street onto Hunter Street revealed that the sight lines both to the east and the west are restricted by vehicles parked on Hunter Street. When this occurs, the measured sight line distance from the stop bar on the north and south leg of Bethune Street is reduced to approximately 30-40 metres which is insufficient for a through or right turning vehicle to select a suitable gap in traffic to exit Bethune Street. To achieve an adequate sight distance, drivers need to pull forward through the crosswalk and beyond the parking lane on Hunter Street. This is one factor to the overall analysis.

All-way Stop Analysis

The key factors used to assess the need for the implementation of all-way stop control includes: 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 or the 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. The warrant for the installation of all-way stop control was met under the Collision Warrant with an average of five collisions over a three year period.

Site Observations

Staff visited the area on several occasions to better assess the existing driving and environmental conditions. The geometric layout of the intersection is a conventional four leg intersection with stop control on Bethune Street. The stop signs are placed behind the sidewalk and are set back approximately 6.0 metres from the curb line on Hunter Street.

During the peak P.M. hour, staff observed traffic congestion on Hunter Street caused by an extended queue extending from the traffic signals located at Aylmer Street. This congestion on Hunter Street blocks north / south traffic on Bethune Street and creates a condition where vehicles from Bethune Street force their way through the queue. This condition causes confusion for drivers and pedestrians wishing to cross the road. A review of the turning movement count data revealed approximately 231 pedestrians crossed Hunter Street and 379 pedestrians crossed Bethune Street during the twelve hour study period.

Discussion

The traffic operational review revealed a significant number of collisions at the intersection due to drivers failing to yield the right-of-way to vehicles travelling on Hunter Street. A review of the sight lines for vehicles entering the intersection from Bethune Street showed that vehicles parked on Hunter Street in the vicinity of the intersection blocked sight lines to a level where it is necessary for drivers to pull forward through the crosswalk and beyond the parking lane on Hunter Street before entering the intersection.

Site observations identified a large number of pedestrians crossing Hunter Street and Bethune Street. Based on the pedestrian demand at this location, staff are of the opinion that a controlled crossing would improve pedestrian safety at this intersection. Analysis of the existing conditions at the Hunter Street West and Bethune Street intersection has shown that all-way stop control is warranted and should be implemented based on the collision history at the intersection.

The environmental conditions and geometric layout of the intersection will change with the reconstruction of Bethune Street corridor. The streetscape improvements and the development of the public realm will ultimately result in much lower volumes of traffic using Bethune Street and a different form of control at the intersection may be warranted at that time. As the detailed design for Bethune Street progresses, an assessment of the ultimate traffic control treatment for the new conditions will be undertaken and any recommended changes will be incorporated into future reports to Council.

Timelines

If the recommendations are approved, implementation would commence immediately and it is anticipated that it would be complete before the end of October 2017.

Summary

The Hunter Street West / Bethune Street traffic operational review has shown that the vehicle volumes for these streets are within the TAC guidelines for arterial and collector roadways. Despite this, a review of the intersection collision history shows a consistent collision pattern that can be improved through all-way stop control. Intermittent sight line restrictions attributed to parked vehicles and presence of pedestrians complicate driver decision making when crossing or turning onto Hunter Street West.

Based upon analysis, the minimum technical criteria for the installation of an all-way stop control is met. The implementation of an all-way stop control is to be considered an interim measure until such time as the reconstruction of the Bethune Street corridor is complete and alternate control is in place.

Submitted by,

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Attachments:
Appendix A: Hunter Street West at Bethune Street Area Diagram

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