



Engineering and Public Works  
Memorandum

File: 11-5460-05

**DATE:** November 29, 2016  
**TO:** Tracy Kyle, Director of Engineering & Public Works  
**FROM:** Russ Mammel, Consultant  
**SUBJECT:** **Intersection Review at 7<sup>th</sup> Avenue and Murray Street**  
**ATTACHMENTS:** Appendix A – All-Way Stop Sign Warrant Conditions

**RECOMMENDATIONS:**

1. That the installation of a traffic signal for the intersection of 7<sup>th</sup> Avenue and Murray Street, currently planned for construction in 2018, be deferred until such time that the standard warrants for a traffic signal installation at this location are satisfied; and
2. That an all-way stop sign controlled intersection be installed at 7<sup>th</sup> Avenue and Murray Street, as an interim measure, until such time that the standard warrants for a traffic signal installation at this location are satisfied.

**BACKGROUND:**

Area residents have expressed concerns regarding traffic safety and excessive side-street delay, at the intersection of 7<sup>th</sup> Avenue and Murray Street. A 2013 traffic study concluded that a traffic signal installation was not warranted and the requirements for an all-way stop sign control were not met, at that time. A later traffic count was conducted during the peak hours on January 7, 2016 to determine if the intersection met the warrants for a traffic signal or the installation of all-way stop control. The District Development Cost Charge program currently lists a traffic signal installation at this intersection as a potential 2018 project, with a Capital budget of \$188,000.

**DISCUSSION:**

Traffic signal Installation

The installation of a new traffic signal should occur only when the established warrant criteria has been met. This provides a cost effective program for the District as well as an equitable method to compare other intersections, which may also be competing for traffic signal funding.

Although the traffic signal warrant criteria for this intersection, was not satisfied in 2013, it was estimated that the traffic volume increases projected for this intersection, will cause the warrant criteria to be satisfied in 2018. A revised traffic count and analysis was carried out on January 7, 2016, which confirmed that the warrant criteria for a traffic signal installation are still not satisfied at this time.

The recommendation is to defer the planned 2018 installation of a traffic signal, for potentially several years, until the standard traffic signal warrants are satisfied. In addition, the recommendation is to proceed at this time with the installation of an all-way stop sign controlled intersection at this location. As discussed below, the warrant requirements for an all-way stop installation are satisfied at this time for the 'delay' and 'interim measure' conditions.

### All-way Stop Sign Control Warrants

All-way stop sign control may be considered if the warrant criteria are satisfied as listed in the Manual of Traffic Control Devices for Canada (MUTCD), published by the Transportation Association of Canada (TAC). The all-way stop sign warrant conditions are included as Appendix A. The MUTCD states that an all-way stop may be warranted if one or more of the conditions are met regarding volume, delay, collisions, and as an interim measure prior to the installation of a traffic signal.

The MUTCD 'volume' warrant for an all-way stop installation indicates that the traffic volumes on the intersecting roads are to be approximately equal and that the minor road approach is to average 200 vehicles per hour for an eight hour period. Based on the January 7, 2016 traffic data collected, the 'volume' warrant condition is not satisfied.

The MUTCD 'delay' warrant indicates that the average delay for vehicles entering the intersection from the minor road is to exceed 30 seconds per vehicle during the peak hour. The intersection was observed during the afternoon peak hour on November 22, 2016. During this period, the left-turn queue length at the Murray St. stop sign ranged between one and ten vehicles. The approximate delay observed for these left-turn vehicles ranged between 10 and 120 seconds, with an average of 46 seconds per vehicle. The longer delays noted could frustrate drivers and encourage them to sometimes accept unsafe gaps when making left-turns onto 7<sup>th</sup> Avenue. The 'delay' warrant condition is satisfied for an all-way stop installation.

The MUTCD 'collision' warrant requires that five or more collisions occur per year, and are of a type that may be prevented by an all-way stop condition, such as turning and right-angle collisions. The available ICBC collision statistics were reviewed for the years between 2009 and 2013. The number of preventable collisions recorded are four in 2009, one in 2010, one in 2011, two in 2012, and three in 2013. The 'collision' warrant condition is not satisfied.

The MUTCD 'interim measure' warrant indicates that an all-way stop control may be installed as an interim measure prior to the installation of a traffic signal. Due to the proposed traffic signal installation, at this location, the 'interim measure' warrant condition is satisfied for an all-way stop installation.

### All-way Stop Sign Control Installation

An adjustment period is required for drivers after an all-way stop installation. Although the driver's concerns regarding intersection safety and Murray Street traffic delays will be addressed, some driver complaints would be expected due to the additional delay on the 7<sup>th</sup> Avenue approaches, especially during peak periods. Also, some complaints of poor stopping compliance at the intersection can be expected, with drivers sometimes rolling through the stop signs, particularly during off-peak periods.

An all-way stop installation would include stop bars and stop signs, complete with 'All Way' tabs, and temporary pole-mounted red flashing beacons, for each approach. 'Stop Sign Ahead' signs should be installed for the 7<sup>th</sup> Avenue approaches, and temporary 'Traffic Pattern Change' signs installed on each approach. The pedestrian crosswalk signs on the east leg of the intersection will be removed. The complete installation is estimated to cost approximately \$2500.

### **CONCLUSION:**

To address concerns regarding traffic safety, pedestrian safety and side street driver delays, at the 7<sup>th</sup> Avenue and Murray Street intersection, the recommendation is to install an all-way stop control at this time, and defer the planned traffic signal installation at this location, until such time that the standard traffic signal warrants are fully satisfied.

Russ Mammel, P.Eng.  
Consultant

## Appendix A

### All-Way Stop Sign Warrant Conditions

from the **Manual of Uniform Traffic Control Devices for Canada** (January 2014 revision)

All-Way Stop signs may be warranted under one or more of the following conditions:

- (a) where the traffic volumes on the intersecting roads are approximately equal, and the combined pedestrian and vehicular volumes on the minor road average 200 per hour for an eight hour period;
- (b) where the average delay to the minor road vehicular traffic entering the intersection exceeds 30 seconds per vehicle during the peak hour;
- (c) where traffic signals are not warranted, and a collision problem exists, as indicated by five or more reported collisions per year of a type which may be prevented by an All-Way Stop sign installation. Such collisions include right and left turn collisions as well as right angle collisions;
- (d) as an interim measure prior to the installation of traffic signals; or
- (e) as an interim measure, for a period of approximately one month prior to switching the stop control from one road to an intersecting road, and the subsequent removal of existing Stop signs on the first road.