

BACKGROUND

At the Operations Committee Meeting held on March 5, 2012, City Staff and staff of HDR Corporation presented a new Pedestrian Crossing Policy for the City as well as the results of site assessments for three pedestrian crossing locations in downtown Sudbury (see Exhibit "A"). The Operations Committee approved the Pedestrian Crossing Policy, but directed Staff to review and report on other options for the Brady Street pedestrian crossing.

Existing Conditions

This unprotected pedestrian crossing is located adjacent to Tom Davies Square on the west leg of the intersection of Brady Street and Shaughnessy Street (see Exhibit "B"). It is approximately 95 metres west of Paris Street and 90 metres east of Minto Street. Brady Street is posted at 50 km/h and carries an AADT of approximately 15,900.

Based on a traffic count conducted on November 12, 2012, there were 187 pedestrians that crossed Brady Street on the west side of Shaughnessy Street and 72 pedestrians crossed on the east side during the afternoon peak period between 4:00 p.m. and 5:00 p.m. Although the pedestrian volumes are high in the peak periods, they are insufficient throughout the day to meet the thresholds required in the Ontario Traffic Manual for traffic signals. The spacing of this location to the adjacent traffic signals does not meet the minimum spacing guidelines of 215 metres between signals. The 215 metre guideline is intended to reduce the potential for driver confusion when approaching closely spaced signals. In this situation drivers may focus on downstream signals rather than the impending intersection.

A review of the City's collision information revealed that there were no collisions involving pedestrians in the last three years in this area of Brady Street.

Based on the above information, HDR Corporation recommended that the existing unprotected mid-block crossing be maintained and enhanced to accommodate this pedestrian desire line. Recommended crossing enhancements to the mid-block crossing include the application of Zebra style pavement markings similar to those used along Elm Street, as well as the addition of "Yield to Traffic" signs at both ends of the crossing.

In order to eliminate jay-walking at random locations across Brady Street, it was recommended that median enhancements be installed along Brady Street to discourage jay-walking and funnel pedestrians to the enhanced pedestrian crossing. Median enhancements can include the installation of a fence and/or planters similar to the median enhancements applied along Elm Street at the Elm Street crossing.

Alternatives

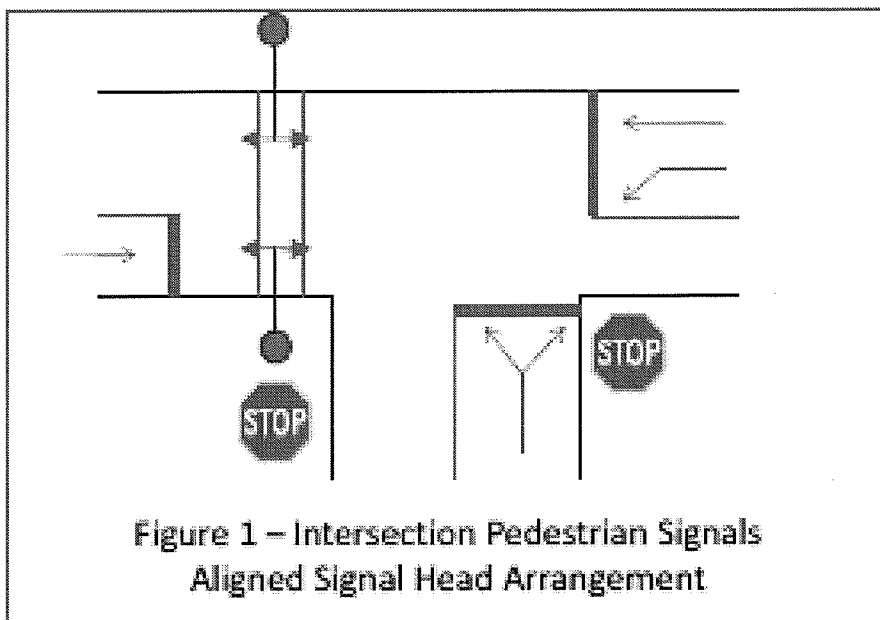
To address the request of the Operations Committee to review other options for Brady Street, the City retained HDR Corporation. HDR has reviewed the following three options for providing a protected pedestrian crossing at the Brady Street and Shaughnessy Street intersection.

1. Intersection Pedestrian Signals with an aligned signal head arrangement
2. Intersection Pedestrian Signals with a conventional signal head arrangement
3. Full Traffic Control Signals with a conventional signal head arrangement

A summary of the alternatives that were reviewed is provided below. The full memorandum from HDR can be found in Exhibit "C".

Option 1 - Intersection Pedestrian Signals with an Aligned Signal Head Arrangement

In this option, intersection pedestrian signals are installed on the west leg of the Brady Street and Shaughnessy Street intersection. The west leg is selected to avoid impeding on the westbound left turn storage area. A schematic of this option is shown in Figure 1.



This type of intersection pedestrian signal is very similar to the signalized crossing on Paris Street at the Southwind Retirement Residence. The estimated cost to install this option is \$100,000 to \$125,000.

Most agencies in Ontario run IPS's in an uncoordinated (or free) operation. This mode of operation minimizes the delays to pedestrians as they are generally serviced immediately. The alternative (coordinated mode of operation) has the potential to introduce a delay before servicing the pedestrian. The concern with this delay is that pedestrians may not wait and cross the road before getting the right-of-way particularly since there are no other signal indications that would give the pedestrian the sense that the signals are actually cycling.

As a result, and for the purposes of this evaluation, it is assumed that the City would operate the signals shown in Figure 1 in free mode. There are both advantages and disadvantages of this option.

Advantages:

- Traditional design for intersection pedestrian signals
- Fewer poles required
- Lower cost than a full set of signals,
- Typically responds quickly to pedestrian demands by running free

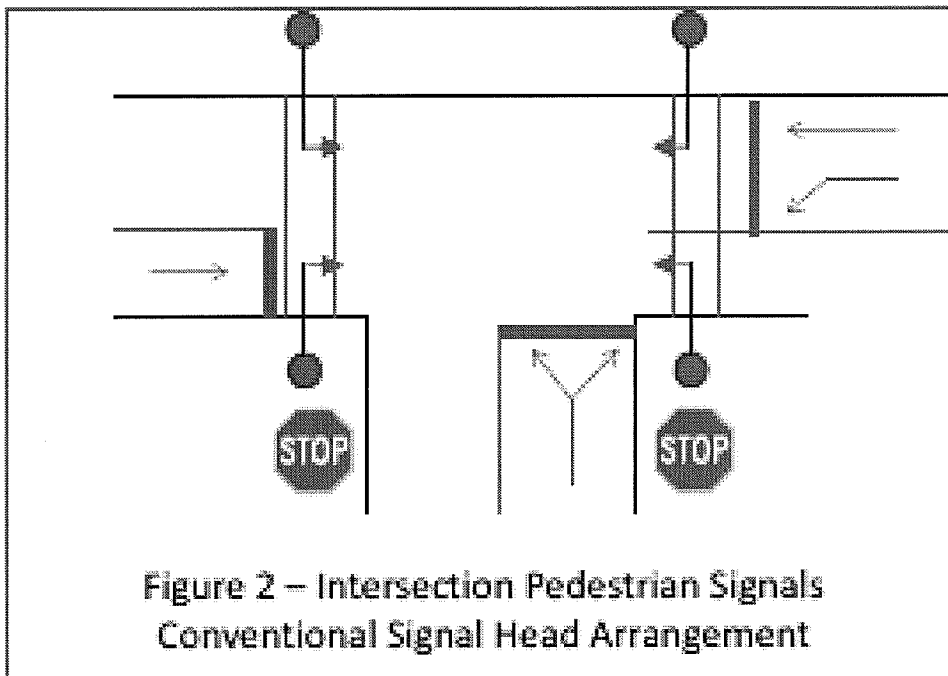
Disadvantages:

- Free operation results in the potential to interrupt signal coordination along Brady Street
- Optically programmed signal displays on Brady Street may confuse drivers (and pedestrians)
- on Shaughnessy Street since the heads will appear dark
- This orientation results in a repositioning of the stop bar for eastbound traffic some 15 meters further to the west, resulting in an even shorter signal spacing with signals at Minto Street

Option 2 - Intersection Pedestrian Signals with a Conventional Signal Head Arrangement

The second option considered an intersection pedestrian signal but using a four-pole, conventional signal head arrangement. This option is considered to allow the eastbound stop bar to be positioned closer to the Shaughnessy Street intersection than in Option 1. Additionally, to address the pedestrian demand crossing the east leg, this Option introduces a second crosswalk on Brady Street. It is schematically illustrated in Figure 2.

The cost to implement this option is significantly higher due to the additional poles and conduit that is required. The estimated cost is \$170,000 to \$190,000.



Again, there are advantages and disadvantages of this option.

Advantages:

- Allows for optional second Brady Street crossing
- Compresses the intersection and maximizes spacing between stop bars
- Typically responds quickly to pedestrian demands by running in free

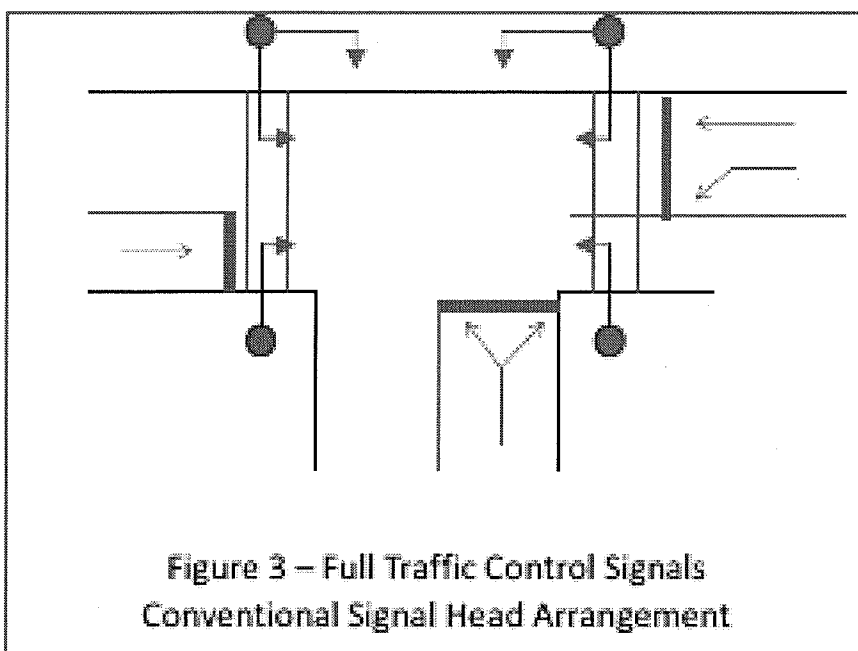
Disadvantages:

- Non-traditional design
- More costly than Option 1
- Free operation results in a potential loss of coordination on Brady Street
- May result in confusion for drivers (and pedestrians) on Shaughnessy Street particularly with optically programmed signal displays on Brady Street

Option 3 - Full Traffic Control Signals with a Conventional Signal Head Arrangement

Option 3 was identified as a means of reducing the confusion to drivers waiting on Shaughnessy Street and re-introducing progression along Brady Street. It consists of a full set of traffic signals. The schematic for this option is shown in Figure 3.

The estimated cost to implement full signals is not much higher than Options #2 at \$180,000 to \$200,000.



Once again, there are advantages and disadvantages of this option.

Advantages:

- This option uses a traditional design
- Minimizes driver confusion on Shaughnessy Street
- Coordination maintained along Brady Street
- Compresses the intersection and maximizes spacing between stop bars
- Safer operations during pre-emption

Disadvantages:

- Longer delay to pedestrians and traffic on Shaughnessy Street
- More costly than Option 1 and marginally more costly than Option 2
- May set a precedent of installing signals where they do not fully comply with the Warrant

Another disadvantage of this option is that full traffic signals will attract additional traffic to Shaughnessy Street to turn left onto Brady Street. This will increase congestion and conflicts between turning traffic and pedestrians.

Median Enhancements

Enhancements to the existing median along Brady Street should be considered with all options in an effort to limit the amount of “jay-walking” across the street and to force pedestrians crossing the street to use the signals at Shaughnessy Street. Median enhancements could include the addition of added landscaping / planting or a fence along the median to limit the potential for pedestrians to cross at various locations between Paris and Minto Streets.

RECOMMENDATIONS

While cost and mobility are important criteria for the City, pedestrian safety is paramount. HDR’s original recommendation of maintaining a marked, uncontrolled crossing is still the preferred result. As indicated previously, there have been no collisions involving pedestrians within the last three years at this location. However, should the option of signalization be selected, Option 3 is recommended as it is expected to result in the highest compliance rate for pedestrians while servicing pedestrians on both the east and west legs. It also offers the advantages of signal progression on Brady Street and the ability to provide optically programmed signal displays with minimal confusion to motorists and pedestrians.

A median consisting of raised planters and/or a fence should be constructed to discourage pedestrians from crossing mid-block.