

TO:	CHAIR AND MEMBERS BUILT AND NATURAL ENVIRONMENT COMMITTEE MEETING ON MONDAY, AUGUST 15, 2011
FROM:	JOHN LUCAS, P. ENG. ACTING DIRECTOR, ROADS & TRANSPORTATION
SUBJECT	HIGHBURY AVENUE NORTH AT TRAFALGAR STREET ADVANCE LEFT-TURN SIGNAL

RECOMMENDATION

That on the recommendation of the Acting Director, Roads & Transportation, Environmental & Engineering Services the following report **BE RECEIVED** for information.

PREVIOUS REPORTS PERTINENT TO THIS MATTER
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For additional information, please refer to the following committee report: Environment & Transportation Committee: October 18th, 2010 "Advance Left-turn Signals"

BACKGROUND

Purpose:

At its meeting on November 1st, 2010, Municipal Council requested the following with respect to advance left-turn signals:

- (a) the Civic Administration **BE REQUESTED** to complete a traffic study at the Trafalgar Avenue and Highbury Avenue intersection, upon completion of the Hale Street/ Trafalgar Avenue overpass and to report the results at a future Standing Committee meeting;
- (b) the matter of the Civic Administration providing the number of left-turn signals that are three car left-turn detection and the number of signals that are five car left-turn detection within the City of London **BE REFERRED** to the Built and Natural Environment Committee for further consideration;

The following report addresses these two items.

Discussion:

Trafalgar Street at Highbury Avenue North

Traffic signals with unnecessary left-turn advance signals increase the delay for the majority of other vehicles travelling through the intersection and make it more difficult to coordinate the traffic signal with adjacent signals (i.e. synchronization). In order to address this issue a warrant system is used.

London warrants for advance left-turn signals are consistent with the practices used in other Ontario municipalities. Advance left-turn signals are deemed warranted when one of the following is satisfied:

- more than 10% of peak hour left-turn traffic requires more than 2 signal cycles to safely complete their turn, as determined by a field study; or
- A review of the collision history indicates that there has been more than an average of two (2) right of way collisions per year over a three (3) year period that may have been prevented with the installation of a left-turn phase.

A traffic study was conducted at the intersection of Trafalgar Street and Highbury Avenue North on Thursday, May 5th, 2011 from 3:00 pm to 6:00 pm. The following table summarizes the peak hour results of this study:

	Southbound Left-turn Movement	Westbound Left-turn Movement
# of left-turn vehicles	87	118
% of vehicles unable to turn on the 1 st green phase	0%	37.4%
% of vehicles unable to turn on the 2 nd green phase	0%	12.6%
% of vehicles unable to turn on the 3 rd green phase	0%	7.1%

During the three hour study period all southbound left-turn vehicles were able to complete their turn on the first signal cycle; therefore, an advance left-turn signal is not warranted. This is consistent with the study that was conducted in 2009. The westbound left-turn movement has increased since the opening of the Charley Fox Memorial Overpass. 12.6% of the left-turners now wait for the third cycle with 7.1% waiting for the fourth cycle. A review of the collision data for the last three years does not show a significant problem with these two left-turn movements.

Based on the above, it is recommended that a westbound left-turn signal be installed to address the delay experienced by this movement. A southbound left-turn signal is not warranted; therefore, should not be installed.

Installation of the westbound left-turn signal will be completed this summer.

Vehicle Detection for Left-turn Signals

It was stated in the October 18th, 2010 report to the Environment and Transportation Committee that the vehicle detection for many left-turn signals was located at the fifth vehicle. The location of the vehicle detection is being moved to the third vehicle whenever an intersection is re-built or loops replaced. It is estimated that the cost to proactively move all vehicle detection to the third vehicle would be \$275,000. The committee asked for the number of intersections that are currently controlled by the third or fifth vehicle. Rather than undertake a survey for this information, staff considered an alternative approach to make left turn signal activation more consistent.

A review of the traffic signal programming identified a method of increasing the likelihood that an advance green signal will appear without the additional cost of new vehicle detection. Starting April 26th, 2011 advance left-turn signal timings were changed so that an advance left-turn signal will appear (if programmed) whenever a vehicle passes the detection zone while a red signal is displayed. Thus, an advance left-turn signal will appear at the beginning of the next green cycle. Vehicles that pass over the detection zone during the advance green or through green phase will not trigger this special sequence. However, these vehicles should be able to complete their turn during the existing green phase. This change in signal programming will benefit drivers during the non-peak times when there may be only one or two vehicles waiting to turn.

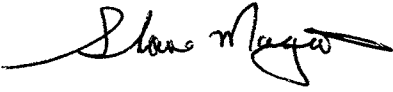
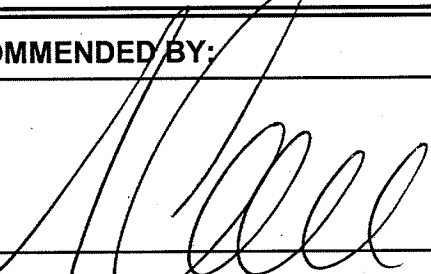

Field observations have confirmed that drivers are receiving the advance left-turn more frequently; however, this does come at a cost to the other vehicles at the intersection which are delayed longer during non-peak times. Performance of the traffic signals will continue to be monitored and changes to the signal timings may be required in order to minimize these delays.

Summary:

Council directed the Civic Administration to investigate the Trafalgar/Highbury intersection and asked for information on left-turn loop detector spacing.

Traffic studies conducted on May 5th concluded that a westbound left-turn signal is warranted at the Trafalgar/Highbury intersection; however, a southbound left-turn signal is not needed. Installation of the westbound left-turn signal will be done when this summer. The loop detector spacing information is not readily available. Considering that the

estimated cost to proactively retrofit new vehicle detection at all 211 advance left-turn signals is \$275,000, staff considered other alternatives that would lead to more consistent left turn signal activation. The computer control system itself offered an expense free alternative new traffic signal timings were implemented on April 26th that increases the likelihood of drivers receiving an advance left-turn signal. Providing the left-turn signal during off-peak times reduces the delay for the left-turn drivers but increases it for all other drivers at the intersection. These changes in service levels are being monitored, with future timing changes possibly being needed to optimize intersections.

SUBMITTED BY:	RECOMMENDED BY:
	
SHANE MAGUIRE, P. ENG. DIVISION MANAGER, PARKING & TRAFFIC SIGNALS	JOHN LUCAS, P. ENG. ACTING DIRECTOR, ROADS & TRANSPORTATION
REVIEWED & CONCURRED BY:	
	
PAT McNALLY, P.ENG EXECUTIVE DIRECTOR, PLANNING, ENVIRONMENTAL & ENGINEERING SERVICES	

July 150, 2011

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cc: J. Braam, City Engineer