SUBJECT: Advanced Left Turn Signals - Mohawk and Upper Ottawa (PW08007) - (Ward 6)  
Public Works Outstanding Business List

RECOMMENDATION:

(a) That the current traffic signal operation at Mohawk and Upper Ottawa be retained;
(b) That the item relating to Increase in Traffic at Upper Ottawa and Mohawk Road - Petition be removed from the Public Works Outstanding Business List.

EXECUTIVE SUMMARY:

At the Public Works Committee meeting of November 19, 2007, Councillor Jackson submitted a petition from Ward 6 residents requesting that advanced left turn signals be installed in all directions at the signalized intersection of Mohawk and Upper Ottawa. The issue was referred to staff for review.

The signal operation at this intersection currently has no left turn signals.

Staff conducted studies at peak and off-peak periods to assess the conditions. Left turns at this intersection do not have difficulty in making this manoeuvre. Less than 2% of all left turns could not make their turn on the first green or amber shown. This is a very good level of service for left turns and is consistent with other similar locations.

There have been no reported collisions in the past five years involving southbound or westbound left turning vehicles. During the same period, eastbound and northbound left
turns have experienced an average of less than one collision per year. This is a good safety record, and does not suggest the need for left turn signals.

The addition of left turn signals at Mohawk and Upper Ottawa would increase idling time, and depending on the direction(s) and time(s) of day of the turn signals added, would increase overall annual fuel consumption by up to 9%, or 44,000 litres. It would result in the production of an extra 84,000 kilograms of carbon dioxide (greenhouse gas emissions).

Pedestrian walk times on each crosswalk would decrease by 25-45% in order to accommodate the time required to serve advanced left turn signals, which would result in increased anxiety and complaints from pedestrians.

The request was not specific to a particular time or direction. The direction and time with the highest demand is eastbound during the weekday morning and afternoon rush hours. Even these movements operate at a high level of service such that left turn signals are not required and would not be of advantage to the overall operation of the intersection.

The study methodology and conclusions are consistent with the Ontario Traffic Manual, the Provincial standard. Staff conclude that the current operation provides the best overall service to all intersection users considering through traffic, left turn traffic and pedestrians and recommend that the intersection is best served with the current signal operation, without change.

BACKGROUND:
The information/recommendation contained within this report primarily affects Ward 6.

At the Public Works Committee meeting of November 19, 2007, Councillor Jackson submitted a petition from Ward 6 residents requesting that advanced left turn signals be installed in all directions at the signalized intersection of Mohawk and Upper Ottawa. The issue was referred to staff for review.

Staff have previously reviewed the conditions for southbound left turns in 2004, 2006 and 2007 and for northbound left turns in 2004. The results of each review concluded that advanced left turn signals were not required.

ANALYSIS/RATIONALE:
The signal sequence at this intersection does not provide left turn signals. Left turn delay usually represents a relatively small portion of the total delay at a traffic signal because left turn volumes are lower than straight through volumes. Determining the correct signal sequence is a key factor in managing the overall delay to traffic and adjusting the crossing times provided to pedestrians.

The addition of advanced left turn signals is only appropriate or justified if one or more of the conditions described below is applicable. Staff conducted studies during morning and afternoon peak periods and off-peak periods to assess the conditions based on these four points:
a) The flow of traffic opposing the left turn is so dense that most left turns are completed on the amber and red signal.

The volumes of left turns vary throughout the day. When left turn volumes are relatively high they have no difficulty making their manoeuvre because the opposing volume is low. When the opposing volumes are high, the left turn volumes are generally low and left turns are made in available gaps. Over 1000 left turns were observed. Less than 2% could not turn on the first green or amber signal. Over 84% of all left turns were made on the green signal through gaps in opposing traffic. This is a very good level of service for left turns.

b) The benefits of reduced delay and fuel consumption to left turns outweighs the increases experienced by all other traffic at the intersection.

A computer simulation was used to estimate the level of delay and fuel consumption for existing conditions and for the addition of left turn signals. The addition of left turn signals at Mohawk and Upper Ottawa will increase overall delay due to longer stopped times for the much higher volume of through traffic, resulting in as much as 9% higher fuel consumption annually. This equals 44,000 litres of fuel which will produce an extra 84,000 kilograms of carbon dioxide emissions (greenhouse gases), as well as other pollutants such as particulate matter. The increased fuel consumption, decreased air quality and delay to other directions of traffic at the intersection would greatly outweigh the benefits received by the left turns.

c) Excessive delay to left turns causes queues to spill into adjacent through lanes.

Excessive delay to left turns would be evidenced by queues which back up so far as to block adjacent through lanes. The existing left turn lanes have sufficient storage to hold left turn queues. No spill over was observed.

d) The ability of left turning drivers to see oncoming traffic is obstructed in a way that cannot be practically resolved.

The visibility of left turning drivers at Mohawk and Upper Ottawa is not obstructed by any physical barriers. This intersection has offset left turn lanes which allow drivers to see around vehicles making left turns in the opposing direction.

The collision history of Mohawk and Upper Ottawa does not include any patterns involving left turns. In the past five years there have been no collisions involving southbound or westbound left turning vehicles. During the same period, eastbound and northbound left turns have experienced an average of less than one collision per year. This is not a safety record which would suggest the need for left turn signals.

The time required to serve a left turn signal reduces pedestrian walk times since they are not permitted to cross when the left turn is active. The walk time, which is the white walking man symbol, provides the highest comfort level for pedestrians and would be reduced by 25-45%. This change would not likely be favourable to area residents.

Based on a review of existing conditions and potential outcomes, staff recommends that advanced left turn signals are not required at this time and should not be implemented at Mohawk and Upper Ottawa. Staff also recommends that outstanding business item ‘AA’ of the Public Works Committee be deleted.
ALTERNATIVES FOR CONSIDERATION:
Adding left turn signals for any or all directions for either part or all of the day is an option, but is not recommended. The direction and time period with the highest left turn volumes is eastbound in the morning and afternoon peak periods, but even left turns in this direction operate well without an advanced left turn signal.

FINANCIAL/STAFFING/LEGAL IMPLICATIONS:
When left turn signals are justified, they are financed from the Modernization capital budget.

POLICIES AFFECTING PROPOSAL:
There are no formal City policies which govern the installation of advanced left turn signals. Staff’s method of evaluating the need for advanced left turn signals is consistent with the Ontario Traffic Manual Book 12, for Traffic Signals, a publication of the Ministry of Transportation for Ontario.

A recommendation to add left turn signals will increase annual fuel consumption by up to 44,000 litres and increase greenhouse gas emissions by up to 84,000 kilograms of carbon dioxide. Increased levels of nitrogen oxide, hydrocarbons, carbon monoxide and particulate matter will also result. These outcomes contradict two of the goals of Vision 2020: consuming less energy and improving air quality.

Innovate Now, the Public Works Strategic Plan released in March 2007, outlines four vision drivers, one of which is serving communities by being leaders in the “greening” and stewardship of the City. In accomplishing this, one area of focus is to reduce Public Works’ environmental footprint on the City. Staffs’s recommended strategy for installing advanced left turn signals only when justified is consistent with that focus.

RELEVANT CONSULTATION:
Councillor Jackson was notified that staff does not recommend the addition of left turn signals at Mohawk and Upper Ottawa and that staff would submit a report to Public Works Committee.

CITY STRATEGIC COMMITMENT:
By evaluating the “Triple Bottom Line”, (community, environment, economic implications) we can make choices that create value across all three bottom lines, moving us closer to our vision for a sustainable community, and Provincial interests.

Community Well-Being is enhanced. ☐ Yes ☒ No
Environmental Well-Being is enhanced. ☐ Yes ☒ No
Economic Well-Being is enhanced. ☐ Yes ☒ No

Does the option you are recommending create value across all three bottom lines? ☐ Yes ☒ No

Do the options you are recommending make Hamilton a City of choice for high performance public servants? ☐ Yes ☒ No
Request for Advanced Left Turns
MOHAWK and UPPER OTTAWA
CITY OF HAMILTON
PUBLIC WORKS DEPARTMENT

LEGEND

EXISTING TRAFFIC SIGNALS

SUBJECT TRAFFIC SIGNAL

SCALE
NOT TO SCALE

DATE
2008-01-09

REFERENCE FILE NO:
PW08007