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Date: December 20, 2022

To: Mayor Davis and Members of Council

From: Inderjit Hans, P. Eng., PMP
General Manager, Public Works Commission

Re: Additional Information Requested from Climate Action Update Report

This memo is in response to the questions that were raised during the December 6, 2022 Committee of the Whole – Operations meeting regarding the Delegation presentation and Report #2022-633 “City of Brantford Annual Climate Action Update”.

During the Delegate’s presentation, it was stated that by the end of 2020, the City of Brantford’s goal was to complete 25% of the streetlight conversion to LEDs. Staff would like to provide the update that between 2020 and 2022, approximately 57% of the high pressure sodium (HPS) streetlights have been converted to LEDs. Some of the cost savings from LED streetlight conversion to date have been utilized to fund additional staff as approved by Council via the HR Committee.

1.0 Recommendations from the Delegate

1.1 Streetlight LED Conversion

The Delegate recommended expediting the conversion of the HPS streetlights to LEDs rather than continuing with staff’s current timeline of seven years. Staff reviewed the report referenced in the presentation and conducted an analysis based on streetlight inventory, electricity use/costs, and connected load. The total cost of converting the remaining streetlights to LED and adding additional LED streetlights to meet current industry standards is approximately $4.75 million, requiring at least three years to be completed due to staff and contractor resources available. The payback period was found to be 4.5 years following project completion.

Currently, the electricity consumption has been reduced by 45% and upon completion of the project it is expected to decrease by up to 75%. As well, converting the remaining streetlights to LEDs will reduce annual CO_2 emissions by 114 T of CO_2e which is a 50% reduction compared to emissions from HPS streetlights. Therefore, if staff were to expedite the LED streetlight conversion cost, energy, and GHG emissions savings can be experienced sooner.

The LED conversion project is brought forward to the Estimates Committee annually for consideration by Council. Should Council wish to expedite the conversion from the original 7-year timeline, the funding can be adjusted in the capital budget. As the work is contracted out, a new contract will need to be issued outlining the new deadlines if an expedited schedule is sought.

1.2 Roundabouts

A recommendation from the Delegate was to utilize roundabouts to reduce GHGs that are produced from vehicle idling. The City of Brantford enacted a Roundabout Installation Policy (Public Works-022) in 2020 that provides direction for staff to consider roundabouts for arterial and collector roadways and in new subdivisions. Per the Roundabout Installation Policy, staff are to use the guidelines to determine if a roundabout is appropriate for intersection control.

In general, roundabouts have a positive impact on the environment by reducing GHGs from vehicle idling at signalized intersections. The exact number of GHGs reduced is dependent on a variety of factors including the roadway traffic volumes, location, topography, and the time of day. Research suggests a roundabout can reduce GHGs between 15 and 60 percent at each intersection depending on the type of road. Average costs of roundabouts vary based on location but can range between $1,500,000 and $5,000,000 as they may involve property acquisition, relocation of underground and aboveground infrastructure, and road reconstruction. Similarly to the cost of roundabouts, the time to complete these projects varies based on the type of road. Staff continues to review the feasibility of roundabouts on existing roadways as reconstruction projects are identified and Section 2.0 provides a list of potential locations.

1.3 Mini Forests

A recommendation from the delegate was to plant mini forests around the City of Brantford as a way to increase the tree canopy and sequester carbon. A mini forest can thrive and make a positive environmental difference in a space that can range from about half a dozen parking spaces to the size of a tennis court. Mini forests grow ten times faster and become 30 times denser and 100 times more biodiverse than those planted by conventional methods. Wilfrid Laurier University's Sustainability Office partnered with volunteers to plant two 500 square foot mini forests at two elementary school sites in Waterloo. The one site was planted with 115 trees and the second site was planted with 55 trees. Planting the mini forests was completed over a single day with each costing approximately $5,000 for the trees, shrubs, and supplies. On average, trees are able to sequester about 25 kg of carbon. Therefore, the two planting sites will be able to reduce 4.25 T of CO_2e per year. Staff will explore potential locations for mini forests as well as partnership opportunities with community groups and Wilfrid Laurier University.

1.4 Grass Cutting

A recommendation from the Delegate was to double or triple the amount of time between grass cuttings on boulevards and in City parks. Currently, City of Brantford staff or contracted services cut urban roadside boulevards and cul-de-sacs every ten days and rough cut roadsides in rural areas once a month. City parks are cut weekly and are trimmed on a ten day schedule. The playing surface of sports fields are being cut twice a week at peak growing season and reduced as appropriate when the growing rates tail off. It is estimated that reducing the frequency of grass cutting by half will reduce the GHG emissions by approximately half, but will also increase potential issues such as complaints from residents, not well maintained outdoor spaces, risk of rodents and ticks, and wear and tear on equipment where it is more strenuous to maintain taller and thicker grass. Taller and thicker grass also requires more staff time to maintain which may result in fewer parks being cut per day and operational budget impacts. Therefore, the more appropriate option for reducing GHG emissions from grass cutting is to make the conversion to battery/electric equipment. The City of Brantford has already begun a shift towards using battery operated machinery, testing a variety of small equipment, utility vehicles, and mowers. Additionally, staff continues to look at opportunities to naturalize areas which removes them from the grass cutting list and sets the cut occurrence to zero.

2.0 Roundabout Candidate Locations and King George Road Information

Currently, the City is reviewing roundabouts per the Roundabout Installation Policy and has determined an ideal candidate location as the Colborne and Dalhousie Street intersection in Downtown Brantford. This project is being brought forward as part of the 2023 Estimates Committee process and if approved will continue to detailed design and construction.

The 2020 Transportation Master Plan Update: 2051 Addendum outlines the roundabout candidate locations as follows:

- Powerline Road and Oak Park Road
- Powerline Road and Paris Road
- Powerline Road and Golf Road
- Wayne Gretzky Parkway and West Street (future development)
- Paris Road and Golf Road
- Oak Park Road and Hardy Road
- Hardy Road and Ferrero Boulevard
- Paris Road and Hardy Road
- Colborne Street West
- Colborne Street West and Dalhousie Street and Brant Avenue
- Clarence Street and Erie Avenue
- Greenwich Street and Mohawk Street
- Colborne Street East and Phelps Road
- Mount Pleasant Road and Phelps Road
- Phelps Road and new road development between Cockshutt Road and Mount Pleasant Road
- Erie Avenue and Birkett Lane

When these intersections come up for renewal and reconstruction, they will be reviewed based on the Roundabout Installation Policy. There are several factors to consider when implementing roundabouts on existing roads because they

may involve acquisition of property and altering the capacity of a roadway which will require an Environmental Assessment.

Additionally, as per the Roundabout Installation Policy, roundabouts should be considered the default intersection control for new developments unless all way stop or signal control is proven to be a superior choice, particularly at two-lane road intersections. Currently, roundabouts are being installed in new subdivision developments in the growth area.

King George Road is owned by Ministry of Transportation (MTO) as a connecting link from Highway 403 north to Cambridge. If roundabouts are to be considered on this road, the City will need to work with MTO on the planning, costs, and installation. The cost share is unknown at this point.

3.0 GHG Impact of Working from Home

Since the beginning of the COVID-19 pandemic in March 2020, the City has shifted to a Work from Home model that has had many benefits for staff and the Corporation, including GHG reductions. With staff working from home, it is expected that electricity and natural gas consumption from Corporate facilities would decrease which would result in fewer GHGs being emitted. While not all staff are able to work from home, those who primarily work in an office setting who are now working from home are consuming less energy at facilities from lighting, office equipment, water usage, etc. For example, 100 Wellington Street (Old City Hall) saw a 2.5% decrease in electricity from 2019-2020 and a further 8% reduction from 2020-2021 (partially attributed to the move to 58 Dalhousie Street in the middle of the calendar year).

Additionally, the City of Brantford reportedly produced 15,002 T of CO_2e in GHG emissions in 2018, not including employees commuting to and from work. City buildings represented 51% of this total or 7,644 T of CO_2e. 100/102 Wellington, 220 Colborne/1 Market, 399 Wayne Gretzky Parkway, and 84 Market represented an overall total of 395 T of CO_2e. The relocation of staff to the New City Hall and divesting these properties was estimated to reduce the overall administrative square footage by 34% which would translate into an estimated reduction of 134 T of CO_2e annually Corporately, which is equivalent to 43 cars on the road.

In terms of commuting and reduction in staff's own GHGs, in 2020 the City of Brantford had 1,115 full-time and 438 part-time employees with an estimated average commute of 26 km one-way. During pre-COVID times with staff working in the office every day, and with an average vehicle efficiency of 10L/100km, the

estimated GHG emissions from commuting was 3,923 T of CO_2e per year. With the work from home model and staff working in the office 75% of the time, approximately 2,945 T of CO_2e are emitted per year. Therefore with staff working from home only 25% of the time, approximately 979 T of CO_2e of their personal emissions are avoided annually, which is equivalent to 316 cars on the road.