

## **Evaluating Biodiesel for City Fleet Operations**

**Date:** October 30, 2017

**To:** Parks and Environment Committee

**From:** Deputy City Manager, Internal Corporate Services

**Wards:** All

### **SUMMARY**

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In February 2017 the Parks and Environment Committee requested a report on the potential greenhouse gas reductions and costs associated with the City switching to the use of different diesel fuels on appropriate vehicles. Staff were also requested to monitor opportunities to utilize funding expected as part of implementation of Ontario's Climate Change Action Plan.

The existing contract for the procurement of fuel for City fleet vehicles currently has provisions that allow the vendor to increase the supply of bio-diesel or other alternative fuels at the City's request. Currently, as required under Provincial legislation, the diesel fuel provided to the City is 4% renewable diesel.

There are a number of options, both short term and long term, for reducing emissions from the City's fleet vehicles. The City, through implementation of the Green Fleet Plan (first adopted in 2004), has been exploring and implementing a range of these options. With the adoption of TransformTO in July 2017 and the target to transition 45 percent of the City-owned fleet to low-carbon vehicles by 2030, the City is looking to accelerate these efforts.

Moving towards increased use of bio-diesel or renewable diesel is one option available to the City, but it is recommended that a thorough evaluation be made of emissions, supply, costs and benefits of bio-diesel and renewable diesel in comparison to other fuel options, such as, natural gas and electricity before moving forward. The City, in partnership with the University of Toronto Transportation Research Institute is currently conducting this analysis. Staff will report the results to City Council following its completion and will make recommendations for action as part to the ongoing review and updates to the City's Green Fleet Plan.

## **RECOMMENDATIONS**

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**The Deputy City Manager, Internal Corporate Services recommends that:**

1. The Parks and Environment Committee receive this report for information.

## **FINANCIAL IMPACT**

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Funding of \$166,600 for the research partnership to evaluate the costs and benefits of bio-diesel and renewable diesel in comparison to other fuel options will be shared 50/50 between the Fleet Services Division and the Toronto Transit Commission (TTC). The costs to TTC in the amount of \$83,300 will be presented for consideration in the 2018 Operating Budget and future year Operating Budget processes. The costs in the amount of \$83,300 to Fleet Services will be funded from the Council Approved 2017 Capital Budget and 2018-2026 Capital Plan (CFL034-Green Fleet).

The Acting Chief Financial Officer has reviewed this report and agrees with the financial impact information.

## **DECISION HISTORY**

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At the July 4, 2017 meeting of City Council, they adopted TransformTO: Climate Action for a Healthy, Equitable and Prosperous Toronto, which included the target to transition 45 percent of the City-owned fleet to low-carbon vehicles by 2030.

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2017.PE19.4>

At the February 27, 2017 meeting of the Parks and Environment Committee the Committee asked for a report on the potential greenhouse gas reductions resulting and costs associated with the City switching to the use of different diesel fuels on appropriate vehicles (see item PE17.6).

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2017.PE17.6>

At the September 6, 2016 meeting of the Government Management Committee the Committee received the third quarter status report on the City of Toronto's Consolidated Green Fleet Plan (see item GM14.12). That report includes a discussion on the City's experiences with the use of biodiesel and associated costs and included as one of its five objectives, the development of selection criteria for alternative fuels.

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2016.GM14.12>

At its meeting on March 28, 2017, City Council received the Report of "Enhancing City-Academic Relations", in which it was stated the City Manager will give consideration to executing a non-binding Memorandum of Understanding with each post-secondary institution to formalize the partnership and provide a framework for greater clarity around specific roles and responsibilities. The Council Decision Document can be found at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2017.EX23.3>

## COMMENTS

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Vehicles are substantial contributors to greenhouse gas emissions and are estimated to represent about one-third of Toronto's community-wide greenhouse gas emissions (GHGs). The City of Toronto in its fleet operations consumes approximately 102 million litres of diesel fuel annually, of which 90% is used in TTC revenue vehicle operations. While the emissions from the City's fleet operations is a very small percentage of total community-wide emissions, it is recognized that the City has a role to play in leading change. In recognition of this, Toronto developed its first Green Fleet Plan in 2004 and, City Council in July 2017 as part of the TransformTO initiative, adopted the goal to transition 45 percent of the City-owned fleet to low-carbon vehicles by 2030.

There are 2 (two) types of bio-based diesel fuels, but the manufacturing process creates different properties and performances:

- 1) Biodiesel is blended into petroleum diesel - performance can vary depending on the fuel blend (percentage of biodiesel mixed with regular diesel) and the ambient temperature (cold weather causes it to gel).
- 2) Renewable diesel is made from the same materials as biodiesel but processed differently and can typically be used anywhere regular diesel is used.

Federal and Provincial policy and regulations recognize the need to address emissions from vehicles and there have been changes made over the years to fuel standards. In the area of biofuels, the Federal and Provincial Governments have been moving Canada towards increased adoption of biofuel with it being estimated that in 2014, biofuels represented 5% of all gasoline and diesel use in Canada (Source: Clean Energy Canada & Navius Research, March 29th, 2016, "Biofuels in Canada"). In Ontario the Greener Diesel Regulation now requires that 4% of the total volume of diesel fuel be bio-based and the bio-based component of this blend must have 70% lower greenhouse gas emissions than standard petroleum diesel. This regulation applies to all diesel wholesale or retail prepared for use or sale in Ontario.

The Province of Ontario did indicate in its Climate Change Action Plan that it intends to provide funding to fuel distributors for high-blend sustainable biofuels and infrastructure upgrades — to help them help consumers lower their greenhouse gas pollution (see Action #1.2 at <https://www.ontario.ca/page/climate-change-action-plan#section-12>). As of the date of this report, the Province has not announced any funding in support of this direction.

In anticipation of the emerging shift to biofuels and federal and provincial policy and regulations, Toronto's current contract for the purchase for fuel includes provisions to request the vendor to increase the supply of biofuels for City fleet operations. Determining whether an alternative fuel, such as biodiesel will provide a benefit over the fossil fuel they will displace requires a thorough analysis of a number of factors. These include (but are not limited to):

- 1) financial costs and benefits;
- 2) full cost accounting of the direct and indirect inputs and outputs and ability to reduce overall greenhouse gas emissions (including a well to fuel tank to wheel study on end to end greenhouse gas emissions);
- 3) similar analysis of other fuel choices, such as natural gas, renewable natural gas, hydrogen, and electric and comparison to the analysis of biofuels;
- 4) investments in options and efforts to improve service delivery that result in reduced use of fleet vehicles and resultant emissions;
- 5) ability to accommodate an increase in the use of biofuels in the existing makeup of City fleet vehicles;
- 6) ability of existing infrastructure to sustain an increase in bio-diesel/renewable diesel;
- 7) ability of the current fleet mix to be able to operate on increased amount of biodiesel/renewable fuel; and
- 8) analysis of any supply constraints of various types of biodiesel/renewable diesel against current and future fleet fuel requirements.

To assist the City of Toronto in undertaking this analysis, staff from Fleet Services and the Environment and Energy Division have engaged in discussions with staff from the University of Toronto Transportation Research Institute. Within the context of the recently signed Memorandum of Understanding between the University of Toronto and the City, a research partnership has been established that will see the University undertake a detailed analysis comparing biodiesel and renewable diesel fuels to diesel for use in the City's fleet vehicles. This analysis will include life cycle greenhouse gas and air pollutant emissions as well as costs, infrastructure, vehicle operations and impacts of relevant policies and programs from federal, provincial and municipal governments.

By collaborating with the University of Toronto the City, at a nominal cost, gains access to experts who are already looking at the shift to bio-based fuels and their expertise in the analysis of the full cost and potential implications, both positive and negative, of an increased use of bio-based fuels in fleet operations. The University of Toronto will complete its analysis by the 4th quarter of 2018 and their work along with staff recommendations will be reported to City Council in the 1st quarter of 2019.

## **CONTACT**

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## **SIGNATURE**

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