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### **TRANSPORTATION AND WORKS DEPARTMENT FLEET AIR-QUALITY MEASURES**

**The Transportation and Works Committee recommends the adoption of the recommendation contained in the following report, May 31, 2007, from the General Manager, Roads:**

#### **1. RECOMMENDATION**

It is recommended that this report be received for information.

#### **2. PURPOSE**

This report provides information on the measures that the Transportation and Works Department has initiated to address air-quality issues through managing the emissions from its fleet. This includes trials with bio-diesel fuels and a future anti-idling policy.

#### **3. BACKGROUND**

Over the past several years the issue of air quality and vehicle emissions has been a real concern. Automobiles are a major contributor to air pollution, particularly in urban areas. Air pollution has a major adverse impact on the environment and the health of Canadians. While emissions of some pollutants from vehicles have declined over the past two decades, air pollution continues to be one of Canada's highest environmental priorities and challenges. Vehicles emit various air pollutants which are major components of smog. Smog days are becoming more frequent with the earliest reported smog day this year on May 24.

Even with the increasingly stringent standards for smog-forming emissions from motor vehicles, mandated by the Federal Government, it is felt that additional measures can be implemented to help reduce the fleet emissions

#### **4. ANALYSIS AND OPTIONS**

As of October 2006, the Federal Government implemented a mandatory reduction in diesel fuel sulphur content from 500ppm to 15ppm in a new ultra low sulphur diesel fuel. The ultra low sulphur fuel is formulated for use in the new 2007 certified lower emissions engines. The fuel can also be used in pre 2007 model year engines, but would not result in the same level of lower emissions as in 2007 engines. Through a new 2006

co-operative fuel contract, the ultra low sulphur diesel fuel is now being supplied to Regional bulk fuel outlets, and is used in all diesel powered vehicles and equipment.

In a survey conducted in the fall of 2006 by the Fleet Services section, there were only two municipalities, Markham and Richmond Hill, of the nine local municipalities that used bio-diesel blends. Since that time, the Town of Georgina implemented a B5 (5%) bio-diesel program in early 2007. In the surrounding regional municipalities, Halton Region is the only one using bio-diesel fuels, from the five regions surveyed.

The current fuel supplier, secured through the cooperative tender process, will supply B5 blended bio-diesel, however, if higher concentrations of the blend are requested, the supplier requires a signed waiver, due to liability issues with regards to the Original Equipment Manufacturer's engine warranties.

The emission levels comparison between ultra low sulphur diesel and bio-diesel are very similar, and are dependent on the source of bio-diesel base stock used in the fuel processes (plant base vs. animal renderings). It should be noted that nitrous oxide (NO<sub>x</sub>) emission levels may increase up to 6%, dependant on which of the base stocks has been use in the formation of the bio-diesel.

Listed below are some of the known advantages and disadvantages for bio-diesel:

**Table 1**  
**Bio-Diesel Comparison B5**

| <b>Advantages</b>                           |  | <b>Disadvantages</b>                                                              |  |
|---------------------------------------------|--|-----------------------------------------------------------------------------------|--|
| – Lower emissions than low sulphur diesel   |  | – Increased nitrous oxide (NO <sub>x</sub> ) emissions                            |  |
| – Similar emissions as ultra low sulphur    |  | – Limited availability of approved bio-mass base                                  |  |
| – Acts as a cleaner/solvent                 |  | – Sediment could plug the fuel dispensers/engine filters                          |  |
| – Eventually removes all sludge from system |  | – Deteriorates rubber seal/gaskets                                                |  |
| – Minimal/no engine modifications           |  | – Unknown impacts on 2007 certified engines                                       |  |
| – Provides modified fuel source to diesel   |  | – Higher fuel blend concentrations gel in cold temperatures, i.e. greater than B5 |  |
|                                             |  | – No approved ASTM fuel quality standard                                          |  |

- Higher % of bio-diesel, i.e. greater than 5% (B5), would void the manufacturer's engine warranty
  - Lower fuel economy
  - Shorter storage life of blended fuels
  - Microbial growth and fuel breakdown
  - Higher cost per litre
  - No to be used in stationary engines
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With the growing concern over air quality and overall reductions in vehicle emissions, the Transportation and Works Department Fleet Services has initiated several programs to help reduce vehicle emissions from the fleet. This includes fuel types, hybrid vehicles, reduced size of vehicles and an anti-idling policy.

#### **4.1 Bio-Diesel**

In order to recommend the future use of bio-diesel, the Transportation and Works Department has established a trial of B5 bi-diesel which started in May 2007. The diesel trucks at the Central Yard, 16042 Woodbine Avenue, will use B5 diesel over the summer and return to using ultra low sulphur diesel in October. The vehicles using this blend will be monitored and a follow-up report will be prepared with the results of the trial in the fall of 2007. The trial vehicles will be compared to vehicles in other patrol yards using ultra-low sulphur diesel.

#### **4.2 Gasoline**

In the fall of 2006 the Provincial government mandated a minimum of 5% ethanol content in all unleaded gasoline. The Region currently uses an ethanol blend of 10% in its unleaded gasoline which further reduces emissions.

#### **4.3 Hybrid Vehicles**

Over the past year, Fleet Services has acquired seven hybrid vehicles, five of which are being used by Transit staff, one is in Water and Wastewater Asset Management and one in Solid Waste Management. These are mostly multiple driver uses and are used in the urban areas where stop and go operations are prominent.

Staff will be conducting an assessment of these hybrid vehicles to determine how effective they are in reducing emissions.

#### **4.4 Vehicle Rightsizing**

One way to help reduce emissions is to reduce the size of the vehicles used and the size of the engine in the vehicle. In order to accomplish this, a survey will be sent to all users requesting input on the type and size of vehicle required for their purposes. It is expected

that as vehicles come up for replacement, a smaller vehicle could be used to replace a larger vehicle that is no longer required for the job purpose.

#### **4.5 Anti-idling Policy**

Vehicle idling wastes fuel and money and generates needless greenhouse gas emissions. It is therefore proposed to introduce an anti-idling policy for Transportation and Works fleet vehicles. There are some challenges to implementing this policy as some of the jobs require vehicles to sit idling for long periods of time. The vehicles have to keep running to provide power to the flashing safety lights on the vehicles. This mainly pertains to the trucks involved in roads repairs to warn the travelling public, protect workers and to provide traffic delineation.

Staff is investigating placing a second battery in these vehicles that will operate the emergency lights independent of the battery to start and operate the vehicle so that vehicle engines can be turned off.

### **5. FINANCIAL IMPLICATIONS**

The current pricing of the B5 bio-diesel fuel, which is adjusted monthly, is \$ 0.8593/l, which represents an increase of \$0.02/l over the ultra low sulphur diesel, May 2007 pricing.

The financial implications of the bio-diesel fuel will result in an additional expenditure of approximately \$1,100 for the estimated 55,000 l of bio-diesel during the trial.

### **6. LOCAL MUNICIPAL IMPACT**

There are no municipal implications associated with this report.

### **7. CONCLUSION**

In order to reduce emissions from Transportation and Works Fleet vehicles a six-month trial use of the B5 bio-diesel blend will be undertaken at the Central Patrol Yard during the summer of 2007. The site will be reverted back to ultra low sulphur diesel prior to the winter season. This trial will be evaluated and reported on in the fall of 2007.

In addition, to help reduce the vehicle emissions and the overall green house gas emissions, the Hybrid vehicle trial will be analysed, the vehicles in the fleet will be downsized if possible, the use of 10% ethanol in unleaded gasoline will be monitored to evaluate its effectiveness in reducing emissions and an anti-idling policy will be implemented.

For more information on this report, contact Brian Harrison, Director, Operations, Roads Branch at extension 5205 in the Transportation and Works Department.

The Senior Management Group has reviewed this report.