

## BC Transit

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### **BC TRANSIT SUPPORTS A FUNDING APPLICATION FOR HYBRID BUSES**

VICTORIA – BC Transit is supporting an application to the Federation of Canadian Municipalities to assist the project partners in adopting hybrid electric technology for transit use.

With the sponsorship of two municipalities, City of Kelowna and Township of Sidney, BC Transit worked with the Winnipeg-based vehicle manufacturer, New Flyer, to develop an application to the Federation of Canadian Municipalities for Green Municipal Funds. These are federal funds made available to the Federation to allocate to municipalities and private sector companies for environmentally sustainable programs.

The application is for a grant of \$2.0 million to assist the project partners in adopting and evaluating the hybrid electric technology for regular transit use. The project has been structured to demonstrate, evaluate and compare the environmental and economic benefits of operating hybrid electric buses in two locations, namely the Kelowna Regional Transit system and the Victoria Regional Transit system. The proposed sites offer very different operating conditions and between them share characteristics common to most Canadian transit systems.

“The \$2.0 million grant would cover the incremental cost of purchasing the six buses, compared to the cost of six standard diesel buses, as well as the cost of project evaluation and reporting,” said Greg Slocombe, chair of BC Transit. “The hybrid electric bus has three major advantages: reduced fuel consumption, reduced emissions, and lower operating and life cycle costs.”

The balance of the project cost, \$3.0 million, would be shared by the municipal partners and BC Transit.

“This is a cutting-edge pilot project, with excellent potential for replication in transit agencies across Canada,” said Slocombe. “These six buses will be the first new hybrid electric buses in regular transit service in Canada.”

Transit agencies are keenly interested in the environmental benefit and cost-benefit analyses generated from the project, as well as the documented experience of integrating hybrid buses into existing fleet, workforce and operational settings.

BC Transit has signed a contract to purchase six 40-foot (12m) production line hybrid electric buses, with delivery in the spring of 2005. Three of the buses will go to the Victoria Regional Transit System and three to the Kelowna Regional Transit System.

Hybrid electric technology plays a key role in producing vehicles that consume less fuel, and have reduced emissions and lower operating costs. The vehicles have E<sup>P</sup>40 System™ diesel-electric drive trains manufactured by Allison Transmission, the company that has researched and tested this technology over the last ten years. The supplier of the buses, New Flyer of Winnipeg, has worked closely with Allison Transmission to produce and test hybrid electric transit buses.

BC Transit is the provincial agency responsible for the planning, management and shared funding of 69 municipal transit systems across the province and is committed to identifying and adopting new technologies to enhance environmental quality and the benefits of transit to communities. In coordinating the delivery of public transportation, BC Transit partners with 50 local governments, 19 private operating companies and 14 non-profit agencies.

# **BACKGROUND: Hybrid Electric Bus Pilot Project**

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## **How the Hybrid Electric System Works**

A “hybrid drive” means there is a combination of more than one type of motive power on the bus. Hybrid electric buses utilize two power sources: a smaller than normal internal combustion engine (about the size of a mid-size pick-up truck engine) and an energy storage unit (the battery). The engine-generator combination works in parallel with the battery, providing electrical power to keep the battery charged. As a result, the engine operates only in its most efficient ranges. For example when accelerating from a stop, the electric transmission accelerates the vehicle to a speed of about 12 kmph,

Once the vehicle is underway, the parallel hybrid system blends both the diesel engine and electric motor power to maintain speed. At highway speeds, the vehicle is powered solely by the diesel engine. During this time, the engine also charges the energy storage system (battery). Significant fuel economy is achieved when the vehicle runs at its optimal speed, offering top engine performance and low exhaust emissions. The vehicle also uses regenerative braking to charge the batteries.

The hybrid electric bus has three major advantages: reduced fuel consumption, reduced emissions, and lower operating and life cycle costs.

- 1. Reduced Fuel Consumption**

Short demonstration tests indicate a 58% reduction in fuel consumption. This equates to over 100,000 litres per year for the six demonstration buses.

- 2. Reduced Emissions**

“Greenhouse” gas emissions, believed to contribute to global warming, are reduced by about 60 per cent. Applying this figure to the pilot project, the estimated reduction in greenhouse gas emissions would be 403 tonnes per year and up to 90% fewer particulates (the visible black smoke from older diesels.)

- 3. Lower Costs**

The hybrid electric system results in lower operating costs due to reduced stress and maintenance on mechanical components such as brake linings. The hybrid transmission has fewer component parts and therefore requires less maintenance. The hybrid bus option has about a 40 per cent premium on capital. The operating costs savings means the break even point in total expenditures will be about 15 years. Buses are typically kept in service for 20 years.

## **New Flyer and Allison Transmission**

New Flyer, which is headquartered in Winnipeg, Manitoba, is the largest manufacturer of transit buses in North America. The company serves many of the largest transit agencies in the United States and Canada, and has supplied BC Transit with buses for many years. New Flyer has partnered with Allison Transmissions, a division of General Motors to take a leadership role in developing hybrid electric transit buses.

New Flyer has just delivered 235 hybrid electric buses to Seattle, both 40-foot vehicles and 65-foot articulated vehicles. Another fleet order is in production for Philadelphia, Pennsylvania. The six BC Transit buses destined for Kelowna and Victoria, will be the first in Canada.