



# Transit's Leading Edge: Innovations in Service and Technology

Public transit is all about meeting community needs. And as needs change, new challenges arise. Overcoming these challenges through innovation has helped Canada's transit industry to remain relevant and successful in an era of constant change.

Through this series of issue papers\*, CUTA is working to raise awareness of transit's substantial social, environmental and economic benefits. To reap these benefits, we must first overcome several important challenges:

- *Attracting new riders*—to tackle congestion and improve access to opportunity
- *Resolving fiscal imbalances*—to better match our resources with our capital and operating needs
- *Meeting environmental concerns*—to improve urban air quality and help meet Canada's Kyoto commitment

We need innovation to successfully meet these challenges, because we cannot solve tomorrow's problems with yesterday's solutions. But this is not a new idea in Canada's transit industry, which the world has long viewed as a leader in new transit strategies and technologies.

This reputation for innovation arose in past decades when—perhaps not coincidentally—senior governments funded major transit research and development programs. Happily, in the last few years the federal government has renewed its interest in transit innovation. Transport Canada, for example, has funded the development of a new tool to evaluate the costs and benefits of proposed transit investments. It has also funded several innovative transit projects through its Moving on Sustainable Transportation (MOST) program, and continued transit-related work at its Transportation Development Centre. Most recently, its Urban Transportation Showcase Program received 15 detailed proposals—many of which boast a strong transit orientation—from Canadian communities, and will fund at least four of them.

Despite these signs of stronger federal support for public transit as a key determinant of quality of life in urban areas, CUTA believes that senior government funding of transit research and development is inadequate. For many years, CUTA has warned that without stronger support for innovation from federal and provincial governments, the industry's ability to meet our national challenges will be limited, and Canada's role as an international transit leader could decline.

This does not mean, however, that our transit industry is resting on its laurels while pleading for more government support. On the contrary, our members continue to prove that their reputation as innovators is warranted. This issue paper showcases just a few examples of how transit industry members across the country have used innovation to reach new heights in environmental responsibility, customer service and cost-effectiveness.

## Fighting smog and climate change

Canadians are becoming more aware of pollution's environmental and public health impacts. And while transit's main contribution to the fight against climate change and deteriorating air quality will be through ridership growth, the transit industry is also working to reduce air emissions from its own operations.

This section illustrates a few of the ways that Canadian transit suppliers and transit systems are "going green".

Canada's bus builders

### Leading the hybrid revolution

Canada boasts an extraordinary concentration of bus building knowledge—in 2001, Canadian manufacturers sold more than half the buses shipped by the six largest bus builders in North America. It is only fitting that Canadian firms should be among the leaders in integrating advances like hybrid-electric drivetrains into their products.

New Flyer Industries Limited of Winnipeg, Man., markets diesel-electric hybrid buses in both standard and articulated lengths. Powered by Allison E<sup>p</sup> parallel hybrid drive systems, these vehicles achieve at least 20 percent better fuel economy than their diesel-only counterparts. Regenerative braking helps charge the batteries during daily operation.

Orion Bus Industries, founded in Ontario and now part of DaimlerChrysler, and BAE Systems have received an order for 325 Orion VII Hybrid buses from MTA New York City Transit. These vehicles have Cummins ISB engines with an extremely low emissions profile and good fuel economy.

Overland Custom Coach Inc. of Thorndale, Ont., and BET Services Inc. of Mississauga, Ont., are partnering in the development of the ELF Environmental "plug-in" hybrid bus. This medium-duty vehicle is powered by batteries that charge from a small on-board generator during operation and from the power grid while parked. Turning the generator off enables zero-emission operation in downtowns or other sensitive areas.

See [www.newflyer.com](http://www.newflyer.com), [www.orionbus.com](http://www.orionbus.com) and [www.overlandcustomcoach.com](http://www.overlandcustomcoach.com) for more information.

Overland Custom Coach



Orion Bus Industries



New Flyer Industries

\* See [www.cutaactu.ca/issuepapers](http://www.cutaactu.ca/issuepapers) to view or download previous editions

Grand River Transit

### Improving air quality with clean diesel

The transit system in the Region of Waterloo, Ont., is helping to reduce air pollution by equipping its diesel buses with special emission controls and running them on advanced fuels.

In 2003, Grand River Transit began purchasing ultra low sulphur diesel (ULSD) fuel with only 15 parts per million (ppm) of sulphur, much lower than the current standard of 500 ppm. ULSD significantly reduces emissions of particulate matter and sulphur oxides that contribute to smog and acid aerosol formation.

Grand River Transit has also launched an ambitious two-year retrofit program that will add catalytic exhaust mufflers to more than 90 percent of its diesel buses. These mufflers will reduce emissions of particulates, carbon monoxide, nitrogen oxides and hydrocarbons. In addition, new diesel buses arriving at Grand River Transit in 2004 will be equipped with continuous regenerating technology (CRT) emission controls that help them operate as cleanly as buses running on compressed natural gas.

See [www.region.waterloo.on.ca](http://www.region.waterloo.on.ca) for more information.

Société de transport de Montréal

### Reducing emissions with biodiesel

In 2002-2003, the Société de transport de Montréal (STM) and a variety of partners undertook the BIOBUS pilot project in Montreal, Que. Over 150 city buses were fuelled using standard diesel with a 5 or 20 percent blend of biodiesel made from recovered and recycled sub-food-grade vegetable oil and animal fat. No changes were needed to either fuel distribution systems or vehicle engines.

The scale of the BIOBUS project made it the most important biodiesel test of its kind in North America. It used actual operating conditions to demonstrate that biodiesel use is viable in Canada's cold winter climate. The project consumed 550,000 litres of biodiesel over one year, and reduced greenhouse gas emissions by an amount equivalent to 1,300 tonnes of carbon dioxide. At this rate, the use of a 20 percent biodiesel blend by the STM's entire fleet would reduce annual greenhouse gas emissions by 22,000 tonnes.

See [www.stm.info](http://www.stm.info) for more information.



Société de transport de Montréal

Saskatoon Transit Services

### Putting home-grown biodiesel to work

Over the next two years, the transit system in Saskatoon, Sask., will conduct a BioBus pilot project to evaluate the commercial use of biodiesel produced from canola grown and refined in Saskatchewan.

Two Saskatoon Transit Services buses will use a 5 percent blend of canola biodiesel while two other "control" buses will run with conventional fuel. Midway through the project, the buses will be switched. Throughout the test period, the emissions, fuel economy and engine wear of each bus will be monitored.

Initial research at the University of Saskatchewan and the Agriculture and Agri-Food Canada Research Centre in Saskatoon has found that each tonne of renewable canola biodiesel saves five times its weight in regular diesel through improved fuel economy. Engines running on biodiesel also wear up to 50 percent less than those using regular commercial fuels—potentially doubling engine life.

See [www.city.saskatoon.sk.ca](http://www.city.saskatoon.sk.ca) for more information.



Saskatoon Transit Services



## Making transit a better option

Many of today's transit customers ride the bus or train by choice. And most of tomorrow's new customers will, too. To become more attractive to both current and future riders, transit systems are striving to simplify and enrich their passengers' experience.

This section profiles some innovations used by transit systems to improve service reliability, reduce fares, and build awareness of transit's environmental benefits. It also highlights one way that CUTA itself is helping transit systems across Canada—and around the world—offer better service to their customers.

Société de transport de Laval

### Listening to customers

The Société de transport de Laval (STL) in Laval, Que., boasts a new, multi-faceted approach to better customer service.

The STL has merged its telephone enquiry and comment/complaint functions, reducing response times and enabling customer service representatives to offer compensation where warranted. It has established an "e-mail club" reaching 20 percent of regular customers. And it uses quick, inexpensive electronic surveys to let customers freely express their opinions on various aspects of transit service.

The STL also offers a Quality Guarantee, compensating customers if their bus arrives more than seven minutes late, if they experience discourteous or rough driving, if their bus is unclean, if they are misinformed or if a request is not answered promptly. Due to this and other initiatives, the number of customers speaking up has doubled while the number of dissatisfied customers has declined.

See [www.stl.laval.qc.ca](http://www.stl.laval.qc.ca) for more information.



Canadian Urban Transit Association

### Transit Ambassador to the world

CUTA's own customer service training and organizational development initiative, called Transit Ambassador, provides state-of-the-art skills to frontline transit staff around the world. Adopted by over 130 transit systems in North America, Europe, Australia, the Caribbean and the Middle East, Transit Ambassador is helping these systems develop the customer service approaches critical to attracting and retaining riders.

For example, CUTA recently certified a number of trainers in Dubai, United Arab Emirates, to deliver the program. Dubai used CUTA's program for a special team of 250 bus operators that served delegates and officials at the 2003 Annual Meetings of the Boards of Governors of the World Bank Group and the International Monetary Fund. While Dubai's role as transportation provider for the meetings was the catalyst for providing the Transit Ambassador training, the municipality is expecting to boost its public image and reduce future customer complaints.

See [www.cutaactu.ca](http://www.cutaactu.ca) for more information.



# Wherever life takes you



Transit Windsor

## Promoting a smog solution

In July 2003, the City of Windsor, Ont., and Environment Canada partnered to offer free transit service on four smog advisory days. This pilot project responded to an escalating number of poor air quality episodes in the Windsor area—a total of 23 smog days in 2002.

The elimination of fares on all of Transit Windsor's regular city bus routes was promoted through public service announcements, following issuance of a smog advisory at 2:00 p.m. on the day before. Windsorites responded to the free transit event with enthusiasm—generating a week-over-week ridership increase of 36 percent on the very first day of free transit service.

See [www.city.windsor.on.ca/transitwindsor](http://www.city.windsor.on.ca/transitwindsor) for more information.



Transit Windsor

Winnipeg Transit

## Working with employers to boost ridership

The remarkable results of the new EcoPass Program in Winnipeg, Man., show that public-private partnerships can increase transit use while helping the environment.

Participating employers in Winnipeg Transit's EcoPass program sell bus passes to workers at a discount, and receive a rebate from Winnipeg Transit. All employers offer a discount of at least 30 percent, for which they receive a 10 percent rebate. Some employers even offer a 50 percent discount, for which they receive a 14 percent rebate.

Since Winnipeg Transit's six-month EcoPass pilot project began in 2002, the original 14 employers have been joined by seven others. Over the first year in participating organizations, bus pass sales increased over 400 percent and transit use grew by 45 percent.

According to Nick Iafolla, Manager of Marketing and Customer Services, "Credit must go to the companies involved in the program. They've committed to protect our environment by reducing congestion, while providing a valuable benefit to their employees."

See [www.winnipegtransit.com](http://www.winnipegtransit.com) for more information.

**EcoPass**

## Getting more from our resources

For many transit systems, rising costs and ridership have not been met with increased funding for operating and capital needs. The need to get the most from every dollar has become, without question, a driving force behind all Canadian transit systems.

This section presents some innovative approaches to maximizing productivity and controlling the costs of transit operations.

Trapeze Software Group

## Software that boosts productivity

In Vancouver, B.C., the Greater Vancouver Transportation Authority (TransLink) has implemented INFO-Agent software developed by Trapeze Software Group of Mississauga, Ont., to provide customers with quick and accurate transit trip itineraries.

The software supports services accessible by both Internet and a new automated voice-recognition phone line, and has allowed TransLink to speed staff training while providing faster, more reliable customer service. Callers to the automated voice line simply speak the trip origin and destination (as addresses, intersections or landmarks), date and time of their trip. The system speaks back an itinerary with route numbers, departure and arrival times, transfer points and total travel time. It can also provide information on multiple trip options, next bus arrival, fares and general policies.

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In Toronto, Ont., the Toronto Transit Commission has implemented FX scheduling software developed by Trapeze. Better scheduling can reduce operating costs and deadhead time, maximizing the use of resources and minimizing fuel consumption and emissions.

FX enables schedulers to work more efficiently, and helps them to examine the cost-effectiveness of different scenarios. It displays information using integrated mapping, quickly adjusts schedules to accommodate detours or calendar variations, and generates work rosters within the parameters of collective agreements and other operating requirements.

See [www.trapezesoftware.com](http://www.trapezesoftware.com) for more information.



Toronto Transit Commission

### Brightening up the ride

The St. John's Transportation Commission (Metrobus) has added solar-powered, light emitting diode (LED) illumination to three bus stops. The new i-STOP, introduced in 2002 by Carmanah Technologies Inc. of Victoria, B.C., offers:

- Lighting for the passenger waiting area
- A backlit bus schedule for nighttime reading
- A pushbutton-activated flashing beacon to notify bus drivers of a waiting passenger, visible for 1.5 kilometres at night and 400 metres in daylight

The i-STOP also enables future enhancements like satellite-linked real-time schedule information that would tell passengers if they have enough time to grab a coffee or a newspaper before the next bus arrives.

The i-STOP is the world's first solar-powered, LED-illuminated bus stop. Each unit costs about \$1,000 but installation is inexpensive because no digging or electrical work is needed. The i-STOP's batteries are charged by built-in solar panels and its LED lights use 90 percent less electricity than regular bulbs without ever wearing out. A computer chip regulates power output, enabling 200 hours of operation on a single 90-minute sunlight charge.

See [www.metrobus.com](http://www.metrobus.com) for more information.



Carmanah Technologies

### Giving priority to transit

The City of Ottawa, Ont., has an extensive system of transit priority measures that help OC Transpo buses minimize delay at intersections and along congested roads. The system of measures includes curb-side bus lanes on arterial roads and shoulder bus lanes on area freeways, as well as:

- Detectors at 30 intersections that identify approaching buses and give them a green light to reduce or eliminate delay
- Special "cigar signals" at intersections that let buses jump the queue and enter intersections ahead of other traffic
- Advance stop bars in bus lanes at intersections that let buses stop ahead of other traffic, and go first when the light turns green
- Lane designation signs and special turning provisions to let buses turn left from the curb lane at traffic signals
- Dedicated exit and entrance ramps that allow buses travelling on freeways to quickly pick up or drop off passengers at intersecting roads
- A "demand for service" indicating system that lets waiting passengers at freeway interchanges signal their presence, permitting buses travelling on freeways to bypass the stop unless a pick-up is needed

See [www.ottawa.ca](http://www.ottawa.ca) for more information.



City of Ottawa

The Canadian Urban Transit Association (CUTA) is the voice of Canada's public transit industry. For additional information, including research reports, industry updates, news bulletins and more, please contact us or visit our website.

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Canadian Urban Transit Association  
Association canadienne du transport urbain

### Automating data collection

Infodev EDI Inc. of Sainte-Foy, Que., has supplied automated high-technology solutions for passenger counting and vehicle location tracking to several Canadian transit systems.

Boarding and exiting passengers at each stop are counted and recorded using directional sensors at vehicle doors, an on-board geographic positioning system (GPS) receiver, and an on-board microcomputer. The information can be downloaded for computer analysis in a number of ways, and the entire process requires no human intervention.

Infodev's automatic vehicle localization system (AVLS) provides real-time bus stop and route identification and next stop announcements. It can also automatically record bus stop arrival and departure times, and average and maximum travel speeds. The system can greatly improve the efficiency of schedule performance analysis, slow traffic zone identification, and other types of evaluation.

See [www.infodev.ca](http://www.infodev.ca) for more information.

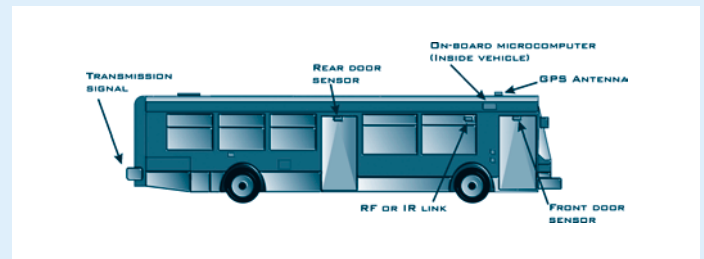


Image courtesy Infodev

### The future awaits

This issue paper highlights only a few of the ways that Canada's transit industry is innovating to improve its products and services, from coast to coast. Many more examples already exist, and others are just around the corner.

To keep abreast of exciting transit developments, visit [www.cutaactu.ca](http://www.cutaactu.ca) for additional in-depth information and direct links to our members' websites.

