

Geared to succeed. . .

## Canada's transit industry right on track!

By John Hughson  
Canada Courier

Because Canada has only two metropolitan areas with populations of greater than 3,000,000 and one city with more than 1,000,000 people, it sometimes comes as a surprise that Canadians have developed a strong domestic urban transit industry.

Surprising or not, the strength of the Canadian industry is being increasingly recognized around the world as more and more countries are turning to Canada for some of the most reliable and innovative urban and mass transit equipment available.

**Examples turn up with growing regularity!**

- During 1981 a total of 143 Canadian-made locomotives were sold to Egypt for a package worth \$155 million — 51 of them sold in August alone.

- A \$21.5 million contract for 168 Canadian diesel buses was signed recently with the Massachusetts Bay Transit Authority serving the Boston area.

- The light rail system of Portland, Oregon, was developed in Canada.

- There are excellent current prospects for Canadian firms in Mexico, Colombia, Venezuela, Peru, the United Arab Republic and Nigeria.

In fact, Canadian transit technology is gaining increasing acceptance in many markets, offering viable alternatives and successfully competing with long established suppliers.

Why? Because over the past 80 years, Canada has developed a solid foundation of specialists in the mass and urban transit fields. The urban transit systems they have developed and built offer affordable and reliable service daily to millions of people around the world. Also, Canadians have had to design equipment that will stand up to some of the most difficult conditions in the world.

Faced with temperature extremes of from -40°C (-40°F) to 35°C (95°F) and more and with highly variable weather conditions, Canadian-made equipment must be, and is, designed to operate trouble-free in all types of climates.

Close attention is given to such details as air conditioning and heating, safety, passenger comfort, economics, noise and environmental pollution reduction. In addition, the products are innovative and noted for their quality, safety and reliability.

Rising costs of labour and energy, growing concern over the environment and a need to redirect investment into more efficient urban development are all forcing cities and towns to rely increasingly on public transit systems. In Canada alone ridership rose by about 250 million to more than 1.22 billion passengers in 1978.

Canadian experience has demonstrated that the well-

planned modern public transit system can serve as a fulcrum for urban regeneration and that public transportation need not be a mere alternative to the private car. The Canadian industry has built a leading edge in the development of new transit technology.

A showplace for this advanced technology, not only for Canada but internationally, will be TRANSPO 86, the quadrennial world's exposition covering every aspect of modern transportation with special emphasis on urban transit.

Canada is host to this highly respected exposition, the theme of which is "Man in Motion" and which will be held in Vancouver, British Columbia, from May to September in 1986.



More than 10 million are expected to attend TRANSPO 86 and they will have an opportunity to examine at first-hand Canada's approach to urban transit. They will also learn what Canadians, inhabiting the second largest country in the world, have learned about moving people and products over great expanses of difficult terrain.

What will they see? A Canadian urban transit industry that provides its own engineering expertise, virtually all its major equipment and systems, and a large portion of the sub-systems and components.

They will see subway cars and trains (steel-wheeled or rubber-tired), streetcars or light rail vehicles (LRVs), commuter rail cars and trains such as the light, rapid, comfortable (LRC) train already in use by AMTRAK in the United States. There will be diesel buses and trolley buses, large and small, rigid or articulated, and large inter-city bus coaches. They will even see marine passenger vehicles.

But Canadian technology does not stop at products. Whole transit systems have been developed for smooth and efficient movement of people and goods.

Canada's urban transportation show-piece is the multi-modal system operated by the Toronto Transit System (TTC). This is a sophisticated and integrated network of subways, streetcars, trolley buses and diesel buses running with precise efficiency throughout the 632 km<sup>2</sup> (244 sq.



electronic systems, Canada provides a major portion of the instrumental and control systems for vehicles. Here "system" refers to the electrical or electronic package fulfilling a major function in the operation of a vehicle or transportation service. This ranges from propulsion systems for vehicles to computerized command and control systems to govern vehicle movement.

In addition, there are the smaller, sometimes more peripheral, systems such as automated bus destination display signs; automatic pedestrian traffic control turnstiles for transit terminals; terminal and transit stop information display systems; even bus stop shelters that double as illuminated advertising displays.

Space does not permit the listing of all Canada's component and sub-system manufacturers in addition to the electronic and electrical producers. However, there are those, many of them internationally known, who create everything from specialized windows, traction motors, steel wheels and bus seats to air conditioning equipment, brake systems, guideways and such care systems as bus and train washers, dryers and vacuum cleaners.

All of this — from major equipment and systems to the smallest components and simplest systems — is the result of constant and ongoing research and development programs both by governments and by private industry to create the most advanced products possible.

One of Canada's most important facilities for the development of new urban transit technology is the Transit Development Centre (TDC) located about 257 km (160 miles) east of Toronto. Established and operated by the Urban Transit Development Corporation Limited (UTDC), an R&D agency of the Ontario provincial government, the centre is a comprehensive facility where the transit community, both of Canada and abroad, can develop new technology.

On 194 hectares (480 acres), the centre is equipped with a

2,500 m (8,200-ft.) electrified standard-gauge test track, test vehicles, laboratories, maintenance and training facilities, automatic train control equipment, and telemetry and data evaluation systems. It also has its own engineering and administrative offices.

The centre has become the focal point of a substantial amount of all transit development work in Canada and is an important source for the North American transit industry. Research and development has been conducted for Transport Canada (the Canadian government's transportation department), the Ontario Ministry of Transportation and Communications, London Transport and the United States Department of Transportation.

Another important Canadian source of research and development is Transport Canada's own Transportation Development Centre, located in Montréal.

The Montréal centre R&D involves all modes of transportation and all stages of the innovative cycle — from concept definition to prototype design; from development and pre-production demonstration to deployment in revenue service.

In its innovative urban transit technology research, the centre has been studying the development of a taxi vehicle that would overcome the shortcomings of regular automobiles in use as taxis; prototype wheelchair restraint systems for vans; microprocessor-controlled destination signs for buses. The centre has also been involved in the study of tracked levitation technology, the magnetically levitated (Maglev) transportation systems.

Private industry itself continues to innovate, carrying out its own research and development in many aspects of urban transit. For example, the area of control and communications systems is a high priority among Canadian companies and all available indications suggest that Canada has a lead in the development of certain urban transportation control systems.

Canadian technology is not confined to products alone. Consulting engineers and construction companies from Canada are also involved in the development of urban transit systems not only in their own country but in all parts of the world.

Regardless of the mass transit requirements — subway equipment, intermediate capacity transit systems and equipment, buses or vehicle monitoring and control systems — Canada has the capability.

**This capability is offered to international customers with the assurance that emphasis will be placed on safety, controlled capital and operating costs, efficient energy utilization, passenger comfort and environmental considerations.**

**Canada can deliver!**

# TRANSPO 86

miles) of Metropolitan Toronto. TTC has also developed techniques for effective co-ordination of its activities with inter-city bus and suburban rail transit system companies.

The Métro subway system of Montréal is another Canadian show-piece noted for its efficiency, quietness, cleanliness and architectural beauty. Its innovative rubber-tired trains virtually eliminate noise and vibration and, in Métro's completely closed environment, the rubber-tired suspension allows safe, reliable acceleration and braking on grades up to 6.5 per cent.

Rolling stock, equipment and systems are not the whole of the Canadian transit scene, however. Components and sub-systems — electronic, electrical or mechanical — are important factors and all are designed, developed and manufactured domestically but with applications anywhere in the world.

In the area of electrical and

# Tomorrow's Transportation — Today



The Canadian Light Rail Vehicle was placed in service in Toronto on September 30, 1979. Developed by the Urban Transportation Development Corporation Ltd., the vehicle incorporates many new passenger comfort features including: large picture windows, fluorescent lighting, low-step entry and exit, forced ventilation and a smooth, comfortable ride.

Twenty-two kilometers (14 miles) west of Kingston, Ontario, Canada, is the home of one of the most revolutionary forms of people transit ever developed.

On these 194 hectares (480 acres) is the Centre for the Urban Transportation Development Corporation (UTDC). The corporation designs, develops and markets new transit systems and equipment for customers in North America and abroad.

After proving its reliability and ingenuity in creating transit systems, UTDC turned its creative ability to the future and set about designing an unobtrusive, efficient and affordable urban rail transit system — one that enthusiastic sages would describe as "tomorrow's transportation — today."

What UTDC came up with surpassed its greatest expectations. It's called ICTS (Intermediate Capacity Transit System), and instead of being part of the tomorrow scene, it's ready for today.

Developed primarily to serve the intermediate capacity range from 5,000 to 25,000 passengers per hour per direction, its design flexibility also provides higher levels of service well outside this basic range.

For the low end of the capacity scale — people-movers for air-

ports and the downtown core — small vehicles of approximately 9 m (30 feet) length can be operated either singly or in short trains. For higher capacity applications, including growth capability for intermediate capacity systems, larger vehicles of more than 15 m (50 feet) can be operated in trains of up to six vehicles.

The combination of train capacity variations and operational station headways down to 60 seconds provides capacity range to accommodate peaks and long-term growth.

Integration with existing urban infrastructure and future development is made easy because of the system's low noise curving, absence of vibration, grade capability, reduced station lengths and available range of guideway structures including long spans of up to 45 m (150 feet).

Easy on the eyes and the environment, it's also easy on the pocketbook. Maximum use of elevated guideway replaces high-cost subway construction. Computer train control reduces staff requirement. Add to this ICTS's exceptionally efficient traction and braking. Adhesion-independent performance of the linear induction motor (LIM) permits line headways of under 40 seconds and station headways of 60 seconds including 20 second sta-

tion dwell. This performance can be maintained at cruise speeds of 72 km/h (45 mph) on grades of up to six per cent; lower speeds for grades up to 10 per cent.

Radial trucks improve curving capacity. Curving without squeal and with reduced wheel/rail wear is provided even on curves with radii below 20 m (65 feet). And collision prevention is assured by providing each train with a stopping point that is a safe distance behind the last reported position of the previous train.

With ICTS, Old Man Winter can do his worst. This remarkable transit is impervious to snow, icy rain or freezing conditions.

Designs can easily be tailored to suit individual requirements and cost constraints. Operationally, the train control system allows great flexibility and simple expandability.

Without hopping into a time machine, ICTS is the closest thing to getting a taste of tomorrow's world — today.

**For further information, contact: Urban Transportation Development Corporation Ltd., Two St. Clair Avenue West, 8th Floor, Toronto, Ontario, Canada M4V 1L7; Tel: (613) 961-9569; Telex: 06-22805**

# Information the Easy Way

Route change, fare increase, road construction, emergency service? How do you quickly get the message across to transit users, when you know that the local media — newspapers, radio, TV — do not always reach the target audience?

The answer is the Multilite Route Director.

This unique pole box device puts the message where the transit riders are — at the bus stops. A product of Multilite Transit Products, a Division of Display Service Co. Ltd., Don Mills, Ontario, Canada, the pole box gives details of service on weekdays, Sundays and holidays.

Durable and rust resistant, it is built to withstand the rigours of Canadian winters. Its outward casing also discourages wanton damage by vandals. The box structure is of heavy steel plate and the unscratchable tempered glass on all four faces is five times stronger than plate glass.

Weighing 13.6 kg (30 lb.) and measuring 21.6 cm x 19 cm x 60 cm (8 1/2 x 7 1/2 x 23 1/2 in.) the device has a removable front panel for pole mounting.

If all panels are not needed for transit use, the pole box in an excellent medium for local interest advertising of theatres, restaurants, fashion shows, sales, store openings or shopping mall events. It can pay for itself in a few months and provide a source of revenue for many years to come.

For the inside of the bus, Multilite manufactures bright and lightweight electrically driven destination signs of modular design built to fit all transit vehicles. The mechanism contains a full-length fluorescent lamp with integral ballast. The white enamelled reflector illuminates the message brightly and clearly. Multilite's gear trains have hardened ground and polished helical

gears for minimum wear and long life. Reversing is accomplished by a patented rocker-arm mechanism that is virtually maintenance-free. Its modular stress rod assembly is designed for strength and easy maintenance. Side and rear signs are identical and interchangeable.

Multilite's Automatic Destination Selector can easily be added. A quick dial and the push of a button, and the ADS changes your curtain automatically. The economical selector can be specified with all Multilite destination signs or is easy to install on existing or competitive signs.

The solid-state electronic control unit is not sensitive to vibration or extremes of heat or cold. The entire unit is 13 cm x 18 cm (5 x 7 in.) and weighs a mere 680 g (24 oz.).

One of the best features is that of safety. It not only eliminates a boring, time-consuming job, but also the need to divert the driver's attention from his basic job. To use, the driver just dials the desired destination number, pushes the button and the job is done. There's even an optional concealed switch for EMERGENCY display.

Expense for maintenance is non-existent, so if the high cost of converting to automatic destination has so far held you back, the Multilite ADS can put you on Easy Street.

The company also provides distinctive curtain printing services. All Multilite products are produced to the highest of quality standards.

**For further information, contact: Multilite Transit Products, Division of Display Service Co. Ltd.; 25 Dyas Road, Don Mills, Ontario, Canada M3B 1V7; Tel: (416) 449-9420.**



# Instant structures continue to spring up worldwide

Bus depots, overhaul facilities, portable aircraft hangars and storage buildings are but a small fraction of the uses to which Sprung Instant Structures have been put in 27 countries throughout the world.

This Calgary, Alberta-based family firm, a member of the Sprung group of companies, was started in 1976 on the basis of nearly a decade of intensive research and development by the parent company which was established in 1887.

Designed and engineered on the principle of the "Membrane Stress Theory" the Sprung Instant Structure is constructed from extruded aluminum arches, integrally connected to an all-weather outer membrane of P.V.C. coated polyester scrim. This synthetic fabric is certified flame retardant (self extinguishing) by the Underwriters Laboratories of Canada and the California State Fire Marshall.

The structure may be designed to withstand snow and wind



Sprung Instant Structures has established its proven worth in virtually every segment of industry. From elegant exhibitions and automotive showrooms to rugged workshops and warehouses — Sprung has covered them all. Here the 18 m x 107 m (60 ft. x 350 ft.) structure is used as a bus depot.

loads up to 292 kilograms per square metre (60 pounds per square foot) and 225 km/hr

(140 mph) respectively. Sprung buildings have been used in the sub-zero temperatures of the

Canadian Arctic, as well as the 60 degree C (140 degree F) of the Middle East.

The fabric is completely waterproof, and is highly resistant to mildew, insects, inorganic salts, alkalis and weak acids as well as other deteriorating factors. It allows light to enter the building but has inhibitors to prevent degeneration from ultraviolet rays of the sun.

The free span structures can be erected quickly and need little or no surface preparation. The modular design allows build-up areas of unlimited length and a wide choice of widths.

For efficient movement of large vehicles, rolling doors can be located on any part of the structure. Heating or cooling can easily be installed by simple attachment to the beams.

A trained and experienced erection supervisor can, with four unskilled labourers, erect up to 185 square metres (2,000 square feet) per eight-hour working day.

**For further information, contact: Sprung Instant Structures Ltd., 1001 - 10th Ave. S.W., Calgary, Alberta, Canada T2R 0B7; Tel: (403) 245-3371; Telex: Sprung 03-826590.**

## Flyer Takes Off to Capture Export Sales



In the bus business since 1930, Flyer Industries Limited of Winnipeg, Manitoba, is the foremost manufacturer of electric trolley buses in North America, with coaches operating in such cities as San Francisco, Boston and Dayton in the United States; and in Vancouver, Edmonton, Toronto and Hamilton in Canada.

Since 1968, Flyer has also earned an enviable reputation as a manufacturer of quality 10.6 m and 12.2 m (35 and 40-foot) diesel buses for urban mass transit applications. Each Flyer vehicle that rolls off the assembly line carries the Flyer trademark — a name that signifies quality design and craftsmanship backed by more than 45 years' experience.

The company's ability to adapt to changing conditions is evident; its diesel coach features the latest options for driver-passenger comfort and safety. The driver area offers wraparound visibility and an instrument console with fingertip control. Increased visibility extends throughout the coach, providing a greater viewing area for both driver and passenger. As well, more light is admitted, making the interior brighter and more spacious.

While the company produces buses with standard seating capacity and arrangements, it is well able to design to customer specifications while always offering the best in insulating and heating systems, fluorescent lighting, decor and upholstery.

An acknowledged expert at handling people-mover problems, Fyer Industries Limited has the capacity to produce approximately 1,000 units annually.

Just recently, the company underbid other major North American bus making companies to win a contract to supply 168 diesel buses to the Massachusetts Bay Transit Authority, which serves the Boston area.

Delivery of buses produced under the \$21.5-million contract will start in January, 1982. Flyer now has a total of \$80-million in orders for diesel and trolley buses for 1982, and is seeking additional export markets. Prompt delivery is assured on all orders.

**For further information, contact: Flyer Industries Limited; P.O. Box 245, Transcona Post Office, 64 Hoka Street, Winnipeg, Manitoba, Canada R2C 3T4; Tel: (204) 224-1251; Telex: 07-57523.**

## Money, man-hours saved with Washtronics...



Practical and efficient, front-and-back drive-through bus washing system from Washtronics.

For more than 30 years Washtronics has been doing business with transit companies and fleet operations all over North America. The company has earned a reputation for manufacturing dependable and efficient servicing equipment for large vehicles.

Washtronics designed and built the first front-and-back drive-through bus washing system. In 1967 it introduced conveyerized bus washing — still the only system of its type available in the world. By eliminating manual bus washing labour entirely, the systems now in use in several large North American cities have demonstrated they are a fast and highly efficient method of keeping a bus fleet clean at all times. The systems are designed to suit a customer's needs and are available in two-brush, four-brush or four-brush conveyerized models. In just 60 seconds, a bus can be completely washed. And the unique water recirculating system cuts down on fresh water.

The Washtronics Automatic Wand Door Actuating Switch allows vehicles to enter and leave garages without an attendant to operate the doors. Transit companies all across Canada and the United States report the device saves them money on heating and air conditioning costs, labour and maintenance costs. In fact, one major Canadian city transit company reported an annual saving of more than 50 per cent in heating costs after installing the Washtronics Automatic Wand system in their garages. The Wand is simple to install and can be used with electrical or pneumatic type door operators. In addition, the system is guaranteed trouble-free in all weather.

The Washtronics Transpolift is a portable vehicle lifting system, designed to make repair and maintenance of large vehicles faster and safer. No permanent installation is required, and Transpolift eliminates the need for pits, pit covers, air or hydrau-

lic lines, pumps, reservoirs and compressors. It is completely mobile and can be used indoor or out, wherever there is an adequate power supply. Because it can be operated by one person, it will reduce labour costs. Transpolift exposes the entire undercarriage for servicing where permanent hydraulic hoist equipment impedes access. Transpolift systems are available to handle four and six-wheel vehicles, and vehicles weighing between 10,886 and 43,545 kg, (24,000 and 96,000 lb.).

Washtronics products are well-designed, well-engineered and built to last and every piece of equipment is backed by the manufacturer's warranty. Washtronics also designs and manufactures custom equipment.

**For further information, contact: Washtronics Limited; 866 King Edward Street, Winnipeg, Manitoba, Canada R3H 0P4; Tel: 775-8126**

## ... and for tunnels or trains, Sherman cleans up



The Sherman Cyclon Bus Vacuum System cleans loose debris from a transit system bus in 2.5 minutes by agitating it from the back door and sucking it out the front door by a bellows-type vacuum system that completely seals the front door.

The cleaners of the urban transit industry are at it again. Now they are scrubbing out subway stations, tunnels and open cuts.

Through consistent emphasis on research, design and engineering, Sherman Supersonic Industries (Canada) Ltd. of Mississauga, Ontario, Canada, has earned an enviable reputation for its dependable, efficient wash

and vacuum systems for all makes and sizes of vehicles including transit system buses and trains. Now the company has turned its attention to the problem of cleaning tunnels.

The accumulation of iron and asbestos dust in subway train tunnels is now recognized as a definite and dangerous health hazard, both to employees and

the travelling public, and removal of this build-up is urgent.

Previous methods using high-pressure water jets have not performed satisfactorily and a more positive method was necessary. In light of this, Sherman has developed a way to wash, by means of rotating brushes, the walls and ceilings of subway stations, round tunnels and open cut-

The unit consists of five brushes — one to wash the roof, one on each side to wash the walls above the car deck and two to wash below the deck. Each brush is supplied with water and detergent. Brushes are retractable and all rotations of brushes are interlocked to ensure that no damage to tunnel installation or equipment will occur.

Believed to be the first of its kind, the Sherman system is adaptable to most subway systems in cities around the world.

Also from Sherman's engineers is a unique vacuum system that removes dry, loose debris from the interior of public transit system vehicles. A large bellows assembly seals over the front door of the vehicle and the rear door is opened. Loose debris, stirred up with an air wand from the rear door, is drawn out the front door by the bellows and into a large hopper. When necessary, a sliding door at the bottom of the hopper is hydraulically opened and the debris dumped into a mobile cart. The vacuum system is completely automatic and can be operated by one person at each bellows.

The company is perhaps best known for its vehicle and equipment washing systems which, through constant development of new techniques to keep abreast of changing vehicle body design as well as testing at every stage of manufacture, require minimum time and effort to operate and maintain.

Portable, stationary and truck-mounted units are available for

cleaning applications ranging from shop parts and engines to buses and tractor-trailers. The Sherman front, side and rear vehicle washing method is designed to automatically clean vehicles of every shape and size.

The FLEET-O-MATIC is a rollover system that incorporates simplicity, versatility and efficiency. The electronically-controlled horizontal brush begins at the front bumper and scrubs grilles and hood, then moves to the top and rear while two rotating vertical brushes wash the sides. When the first cycle is completed, FLEET-O-MATIC automatically reverses brush rotations, rinses with clear water and waxes if desired. Specially designed spray nozzles apply washing and rinsing solutions to the brushes and the vehicle.

Sherman also produces a wide range of pressure wash units that are ideal cleaning tools for cars, trailers, motor homes, engines and even service shop floors and walls. They can be used with cold water, hot water or steam with added detergents or chemicals.

In addition, the company is prepared, equipped and willing to design and build washing systems for customers requiring wash tures. Recognized Sherman quality goes into all products.

**For further information, contact: Sherman Supersonic Industries (Canada) Ltd.; 3133 Orlando Drive, Mississauga, Ontario, Canada L4V 1C5; Tel: (416) 678-1700; Telex: 06-968696.**

## Automatic vehicle monitoring one of many Glenayre specialties

Glenayre Electronics Ltd. based in North Vancouver, British Columbia, can boast an outstanding design team and flexible production facilities. This winning combination works to produce highly reliable products in four major groups — communications; transportation systems; power conversion; and instrumentation and control assembly.

The company designs and manufactures the most advanced Mobile Telephone Control Head in North America — the GL 2000. This microprocessor-based unit features automatic call initiation and has many other unique qualities.

Before the GL 2000, there was Glenayre's highly successful 1400

scanning control head enthusiastically adopted by Bell Canada in Ontario and Quebec and parts of the U.S.A. There are currently more than 12,000 GL 2000 mobile control heads and 3,000 of the 1400s operating in the field.

The company now offers IMTS central office control equipment such as the model 1200 Radiotelephone terminal incorporating microprocessor control and fully solid-state audio switching.

For the transportation systems, Glenayre designs and manufactures systems and hardware for automatic vehicle monitoring (AVM). The company has clearly demonstrated its ability in the

AVM field with successful projects involving buses, trains, trucks and subway cars.

Glenayre has recently completed a Radio-Linked Train Control System for the B.C. Railway and is involved in the planning of a \$2.4 million operational implementation on 36 locomotives.

One of Glenayre's newest developments is the Mine Dispatch Support System (MIDISS), a fully computerized dispatch and control system that optimizes productivity through the control of truck traffic in open pit mines.

In May, 1981, a MIDISS pilot system was installed in the Lornex Mine Corporation in British Columbia and Glenayre hopes to commence full instal-

lation in October of this year. Interest in MIDISS has been shown by open pit mining companies in North America, Australia and Britain.

In the area of product sales, the company is supplying a Transponder Reader and subsystem comprising Model 6215 Interrogator Coil Unit and Model 6502 Controller to Vapor Corporation of Chicago for use with the Train Onboard Recording (TOR) System. Transponders located on the trackbed provide TOR with the precise location information needed to interpret other events recorded on magnetic tape.

New products developments include a proximity beacon for

locating non-tracking equipment and a low-priced transponder for electronic tagging of anything from freight cars to mail bags.

Industrial control consoles and panels are other specialties, along with highly reliable cost-effective power supply packages for data-processing, communications.

No matter the problem — Glenayre's 35 professional engineers and an expert staff of 150 have a long history of providing original, innovative solutions to both standard and custom requirements.

**For further information, contact: Glenayre Electronics Inc., 1551 Columbia Street, North Vancouver, British Columbia, Canada V7J 1A3; Tel: (604) 980-6041; Telex: 04-352520.**

## Dofasco rides successful rails



One of Canada's leading steel manufacturing companies, Dofasco is also a leader in the design and manufacture of railroad and transit systems trucks. The company's design concept, which has resulted in a modern generation of rapid transit trucks, is based on appropriate riding qualities; durable, rugged construction; operational safety considerations; lightweight, compact design; maximum utility and minimum maintenance; and low overall cost.

Dofasco Inc. is a fully integrated steel producer located in Hamilton, Ontario, Canada. Over the past decade, the company has experienced tremendous growth and today employs 11,500 people producing more than four million tons of steel products annually.

From a producer of steel railway castings, Dofasco has grown to become a leading designer and builder of a wide range of railroad trucks. As an integrated steel producer, the company has broad metallurgical knowledge and skills available that few foundries could hope to match. Engineers and designers in the Transportation Products Department are experienced in both steel castings production and the design of railway truck castings.

Dofasco has been producing railway castings for 69 years; today they continue to be a prominent part of the foundry's production. Railway castings produced include such items as AAR approved side frames, bolsters, couplers, strikers and yokes. These are in addition to rapid transit, mainline and locomotive truck castings.

All steel for the truck castings is made in electrical furnaces flexibility of which makes it possible to produce a wide variety of steels for specific end applications. Moreover, the production process utilized reduces sulphur content to less than 0.015 per cent for high ductility and resistance to breakage. The company's foundry and metallurgy groups work closely with the transportation products team to assure that the correct steel is specified.

Dofasco's foundry employs modern processes for the production and testing of castings. Quality control is practiced every step of the way — from melting practice to finished casting. Magnaflux inspection and other testing procedures are available where needed. Where alternative proof of quality is required, castings are radiographed by X-rays or the cobalt camera technique.

Dofasco is the major supplier of trucks to Canada's locomotive builders — about 65 per cent of Canada's locomotives run on Dofasco trucks. This engineering and production background helped assure a successful transition into the rapid transit car/truck field in the early 1960s.

Since that time, the company has produced a variety of trucks for rapid transit including the M. and H series of rapid transit trucks for the Toronto Transit Commission. In addition, Dofasco has designed and produced the Tempo trucks for mainline passenger service and, more recently, the LRC locomotive and coach trucks for Bombardier Inc. These trucks are now going into service with Via Rail Canada and Amtrak. The Transportation Products Department also designed and produced the mainline or Bi-Level truck, now in service with the Toronto Area Transit Operating Authority on their commuter service.

Over this time, the "art" of truck design has been shifting toward a high technology discipline, and Dofasco has continually added new skills and techniques as they prove effective

while maintaining strong links with tradition. This evolution began with more sophisticated structural (casting) analytic and test techniques but over the last 10 years has centered on suspension design and test methods. This latter work has little or no relation to a foundry but everything to do with the design of better trucks and Dofasco's ability to contribute to improved vehicles. In fact, it is increasingly evident that the truck and suspension system, as the link between the rails and the vehicle, is of critical importance to the success of the vehicle and even the entire system.

Similarly, the Dofasco organization readily interlocks with car builders, operators and other "partners" as part of their teams or "task forces" on projects. An active field service group is in place to "follow through" on the operation of Dofasco trucks after they are in service.

Dofasco has an impeccable reputation as a responsible and substantial company while the foundry division has an equally enviable record for quality. The Product Development Group embraces both strong traditional experience and progressive new thinking.

Dofasco's best credentials are its products — and the opinion of those who use them.

**For further information, contact: Dofasco Inc.; P.O. Box 460, 1330 Burlington Street East, Hamilton, Ontario, Canada L8N 3J5; Tel: (416) 544-3761; Telex: 061-8682.**

## Orion Proves Popular . . . and Practical, Too

Described as "the Cadillac of buses", the Orion, manufactured by Ontario Bus Industries Inc. of Mississauga, Ontario, Canada, represents the dream of its designer to develop the ultimate in transit buses, combining the ability to move people conveniently, safely and efficiently with the economy of low capital investment and proven low ongoing maintenance costs.

Today both the 9 m (30-ft.) and 10 m (35-ft.) Orion models are in use in many cities and towns throughout North America giving service to both drivers and passengers that has won Orion its "Cadillac" reputation. They can be found serving as heavy-duty transit and suburban intercity coaches, airporters and specially built ambulance buses.

Rugged and highly maneuverable with a turning radius of 9.7 m (32 ft.), they are equally at home in city traffic or on the highways. And fuel consumption, rated at 20 to 30 per cent better than many other comparable buses, makes them extremely practical.

Orion was designed from the ground up using the toughest and most serviceable standard equipment available combined with a steel monocoque body mounted on a steel frame running the length of the bus for strength and stability. Power is by a Detroit Diesel 6V53 engine with an Allison four-speed MT643 automatic transmission. The axles are the same size as used on larger intercity and transit coaches while 15 cm (6-in.) wide front brake and 25 cm (10-in.) wide rear brake contribute to long brake life. An air suspension system provides a comfortable ride.

A special feature of the Orion is the wide single door at the

front that slides back into the windshield area. This design is excellent for bad weather as the door is sealed effectively and, with the help of heating units in the step well, keeps the entrance free of ice and snow.

Design of both the 9 m (30-ft.) and 10 m (35-ft.) models incorporates contemporary styling and tall, double glazed windows in the side and rear for maximum passenger and driver visibility — a plus for sight-seeing. Seven exits provide for passenger emergency safety. Both models are 2.4 m (8 ft.) wide and 2.9 m (9½ ft.) high.

Ease of access to the various components considerably simplifies maintenance and servicing and helps cut costs. The rear engine compartment has a slide-out feature while the locked, water-tight electrical panel is located just below the driver's window. All electrical connections are numbered and the panel well lit.

Many custom options are available for the Orion including a wheelchair lift at the front door, extra heating units, air conditioning, interior variations, power steering and public address system.

Ontario Bus Industries takes considerable pride in its Orion buses and shows it in the meticulous attention given quality control, the quality of materials and equipment used and in the manufacturing process itself which shows the stamp of skilled craftsmen.

**For further information, contact: Ontario Bus Industries Inc.; 5395 Maingate Drive, Mississauga, Ontario, Canada L4W 1G6; Tel: (416) 625-9510; Telex: 06-960148.**



Shown in its intercity coach configuration, the 9 m (30-ft.) Orion bus has a passenger capacity of 31 to 33 seated. In transit configuration it can seat 31 with a further 30 standing. The 10 m (35-ft.) model Orion can seat 39 to 45 as a coach, and in transit configuration, seats 39 with 40 standing.

## LRC® trains on rails to success



Bombardier's LRC train is tracking it into the consciousness of transit system officials throughout North America and in many other nations because of its unique characteristics that place it in the forefront of mass transit technology.



Light, rapid, comfortable — LRC® — its name says it all.

Considered by many to be the ultimate in mass transit intercity rail equipment, the LRC train from the Mass Transit Division of Bombardier Inc. is gaining increasing acceptance throughout North America and the world. The LRC is already in highly successful use with AMTRAK in the United States and will form an important part of VIA Rail's rolling stock in Canada.

Less than a decade after entering the mass transit field, Bombardier has become one of the leaders in the manufacture of rail passenger vehicles. Its transit product range is already more extensive than that of almost any other company in the Americas, running from streetcars to high-speed intercity trains.

Designed and developed in partnership by Bombardier, Dofasco and Alcan, three Canadian companies with many years of experience in manufacturing railroad equipment, the LRC train is perhaps the most practical and cost-effective high performance train built — it accommodates to existing tracks without requiring major and expensive changes.

Straight, dedicated rights of way are unnecessary and thus there is no need to expropriate land, unsettle the environment and build new lines, new stations and yards or new bridges.

This unique ability of the high-speed LRC train to run on existing track is the result of innovation and advanced technology. The secret is a fail-safe, automatic power-banking system that



banks the LRC's coaches as much as 8.5 degrees from the perpendicular as they enter curves, counteracting the unsettling effects of centrifugal force. This allows the train to maintain high speeds, taking curves faster than comfortably possible with conventional equipment.

In fact, the LRC train can round a curve with absolute safety and passenger comfort faster than any other train in the world and, through not having to slow down for curves, saves a significant amount of travelling time.

From the passenger's point of view, the train rides as if it were on a constantly straight, smooth track.

Maintenance is another LRC cost-effective feature. The train's diesel engine is a recognized and proven model known for its reliability, efficiency and, importantly, its ease of maintenance. Because of this, existing railway staff and equipment can be used with little need for special facilities or training programs.

In addition to the LRC train, Bombardier produces a wide variety of other rail passenger vehicles including single-level, gallery, self-propelled and push-pull commuter rail cars; steel wheeled subway cars; rubber-tire subway cars and trains; and light rail vehicles. There are also

diesel-electric locomotives for national and international markets.

Bombardier entered the mass transit field with its rubber-tired subway cars and trains, first produced for the subway system, or Métro, of Montréal. The rubber tires not only provide a smooth, quiet, comfortable ride, they also cut to a minimum noise and vibration to the surrounding area, eliminating the need for soundproofing in tunnels and stations.

Another product, developed jointly by Bombardier and BN of Brussels, Belgium, is the light rail vehicle (LRV) designed to meet the needs of today's and tomorrow's light rail transit systems. It combines the latest in LRV technology and modular design and is offered in four, six and eight-axle versions in widths up to 2.7 m (9 ft.). Design emphasis has been placed on safety, eye appeal and passenger comfort.

® Registered trade mark of Bombardier Inc., Dofasco Inc., and Aluminum Company of Canada Ltd.

For further information, contact: Bombardier Inc., Mass Transit Division; 1350, rue Nobel, Boucherville (Québec) Canada J4B 1A1; Tel: (514) 655-3830; Telex: 055-61576.

## Meet "Le Mirage"



In the transportation industry for more than half a century, Prevost Car Inc. of Ste-Claire, Québec, is best known as a manufacturer of highway or charter coaches. However, some of the company's coaches have been selected for airport service where traffic density and distance require fast, comfortable vehicles with large, readily accessible luggage compartments. For example, Montréal International Airport at Mirabel uses more than 40 Prevost vehicles.

The latest addition to Prevost's TS-47 family of three-axle, 12.2 m (40-ft.) deluxe coaches is Le Mirage, a deluxe highway coach that has been designed with

passenger comfort in mind. When it comes to passenger visibility Le Mirage is unmatched in the industry. The new windshield provides 50 per cent more forward vision which has been further increased by the use of roll-type sun visors and swing away destination signs. Each side of the coach features high panoramic windows tinted to allow only nine per cent sun penetration, with limited solar heat and an efficient air conditioning system further enhancing passenger comfort.

Seating arrangements vary: some vehicles offer tables and an optional galley which has all the facilities necessary to serve light

meals, including hot and cold drinks.

The company can also design to customer specifications meeting all the safety requirements specified in most of North America.

Currently exporting to the United States and with a number of its Le Mirage and Prestige models in use in Hawaii, Prevost Car Inc. is ready and willing to supply additional markets. The company is capable of producing 350 units per year.

For further information, contact: Prevost Car Inc.; Sainte-Claire (Québec) Canada GOR 2V0; Tel: (418) 883-3391; Telex: 051-2257.

### Some Canadian Participants at IPTE '81

- Alcan Products Limited** — extruded aluminum structural shapes, sheet, skin;
- Automatec, Division of BG Checo International** — subway signal systems, turnstiles;
- Bombardier Inc.** — light rail vehicles, LRC trains, subway cars;
- Brown Boveri Canada Limited** — electronic propulsion and control equipment;
- Dofasco Inc.** — custom rail trucks and suspension systems;
- Ferranti-Packard Electronics Ltd.** — passenger terminal and vehicle electronic signs;
- Flyer Industries Limited** — city and commuter buses;
- Glenayre Electronics Ltd.** — automatic vehicle monitoring systems;
- General Motors of Canada Limited, Diesel Division** — articulated and standard buses;
- Hawker Siddeley Canada Inc.** — rail coaches, subway cars, light rail vehicles;
- Leigh Instruments Ltd.** — transit system strain recorders, health monitoring systems;
- Multilite Transit Products, Division of Display Service Company** — bus destination signs;
- Ontario Bus Industries Inc.** — urban diesel buses;
- OTACO Industries Ltd., Division of Redlaw Inc.** — transit seating;
- Prevost Car Inc.** — articulated and standard buses;
- SEL Canada** — automatic train control systems;
- Spaulding Fibre Canada Limited** — electric third rail insulators and covering;
- Teleride Corporation** — computerized dial-up bus service;
- Transpo 86** — international 1986 transportation exhibition;
- Translift Equipment, Division of Vada Industries Ltd.** — wheelchair lift;
- Urban Transportation Development Corporation Ltd.** — advanced light rail transit systems;
- Wabco International** — pneumatic brake equipment;
- Washtronics Ltd.** — automatic bus washing and interior cleaning equipment.

# Transportation for the times



Distinctively styled bi-level coaches which seat 162 passengers on two complete decks are so successful that orders for more than 70 additional cars have been placed by GO Transit, the commuter service serving southern Ontario. Versions of this car, which can seat up to 200 passengers, are designed and built by Hawker Siddeley's Canadian Car Division.

## Canadian Car Division

The transit car design and manufacturing facilities of Hawker Siddeley Canada Inc. are located at its Canadian Car Division in Thunder Bay, Ontario, Canada. Canadian Car experience in all types of rail passenger equipment goes back almost to the turn of the century, with emphasis on mass transit cars beginning some 20 years ago.

At that time, the first long, lightweight car utilizing a light alloy body on a steel underframe was introduced; a design concept which offered several advantages over all-steel cars. Some 460 cars of this type have been built, in successive batches, for Toronto Transit Commission subway operations. Each new order has resulted in engineering and cosmetic improvements and the latest H5-type cars, with partial air conditioning and chopper controls, are today among the

most energy-efficient units in use.

The long, lightweight design has been extended to the commuter car field and all the passenger rolling stock operated on the highly successful GO Transit rail commuter service in southern Ontario has been designed and built by Hawker Siddeley Canada. A total of 123 94-seat cars supplied has been followed by the design and manufacture of 80 distinctively styled bi-level coaches which seat 162 passengers on two complete decks. Their success, in terms of operator and commuter satisfaction, has led to an order from GO Transit for 71 additional cars. Versions of this car, seating up to 200 passengers, or with cab and power modules, can be built.

Other light alloy bodied cars have been produced for the mass transit system at Expo 67 in Montreal (the first in North America to be fully automated),

for Mexico's national railways, which received 200 coaches, and for Canadian National Railways which operates five trainsets on inter-city services.

Lightweight cars built by Hawker Siddeley Canada can be supplied with riveted or welded aluminum bodies and with painted or natural brushed finishes. Air conditioned mass transit cars built for the Port Authority Trans-Hudson (PATH) had welded aluminum bodies partially clad in stainless steel.

Considerable experience has also been accumulated in the design and manufacture of steel-bodied cars, stainless and painted. An order from the Massachusetts Bay Transportation Authority (MBTA), Boston, was for a total of 190 all-steel, painted units. A modular construction technique allowed 70 cars to be built for Blue Line operations and a lengthened

version for Orange Line service.

The Canadian Car Division's most recent experience in light rail vehicle production is in the supply of 190 Canadian Light Rail Vehicles (CLRVs) designed by the Urban Transportation Development Corporation for operation by the Toronto Transit Commission.

Thousands of mass transit passengers can attest each day to the comfortable, reliable service provided by cars designed and built by Hawker Siddeley Canada. Broad experience in design, concern for efficient energy use and low maintenance costs, modern manufacturing methods and project management procedures, and full product support services combine to assure customers a high performance car in large batches or in small.

## Canadian Steel Foundries Division

With the largest steel foundry operations in Canada, Canadian Steel Foundries Division in Montreal, Quebec, produces carbon and alloy steel castings in weights up to 120 tons for a variety of industries. An important part of the Division's total business is the production of castings for passenger and freight rolling stock. In addition to supplying the Canadian market, railway castings are exported to the United States and Mexico. Side-frame, bolster, coupler, yoke and draft gear castings are produced in volume, many of them for Hawker Siddeley Canada freight and passenger car building plants, with the balance shipped to other carbuilders and various railways for maintenance purposes.

The Division also produces the CSF truck, a refinement of a design which has been proved in service with operators around the world. It has established a reputation for excellent ride qualities, safety and reliability. With its omni-directional energy absorbing characteristics, the CSF truck is ideal for all types of railway track — including lines subject to heavy usage. Except for certain replaceable parts, all components are produced by manufacturing units of Hawker Siddeley Canada with detail engineering and final assembly carried out by Canadian Steel Foundries Division.

## Canadian Steel Wheel Division

The only manufacturer of wrought steel railway wheels in Canada, the Canadian Steel Wheel Division of Hawker Siddeley Canada Inc. has produced more than 2 million wheels since 1959 for railway passenger and freight cars, locomotives and rapid transit equipment. Its plant in Montreal, Quebec, capable of a production rate of more than a wheel a minute, is one of the most highly automated of its type in the world. Operations are completely integrated, from steel making in electric arc furnaces to forging, rolling, heat treating, machining, inspection and test.

Wheels are supplied to Hawker Siddeley railcar production units, to other car and locomotive builders and to railroad and transit authorities as maintenance spares. Railways in 39 countries know the benefit of CSW rolled wheels which are available to AAR Specification for five main classes of service.

## Trenton Works Division

Although primarily engaged in the design and manufacture of railway freight and tank cars for domestic and export markets, the Trenton Works Division of Hawker Siddeley Canada Inc. in Trenton, Nova Scotia, is also the only Canadian producer of railway axles.

The plant has forging, heat treatment and automatic machining facilities dedicated exclusively to manufacturing axles from raw billets. Capacity is 40,000 axles per year. Axles are produced for the plant's own production lines, for other builders of railway freight and passenger cars, and locomotives, and for railroads as maintenance spares. Stringent quality control, including 100 per cent ultrasonic testing, ensures a completely reliable product.

Railway axles are supplied rough machined, semi-finished or finish machined to customer specification. Wheel and axle assemblies can also be supplied.

**For further information — please indicate Division of interest — contact: Hawker Siddeley Canada Inc., 7 King Street East, Toronto, Ontario, Canada M5C 1A3; Tel: (416) 362-2941; Telex: 06-217711; Cable: HAWSIDCAN.**

## Beaver — the accepted name in turnstiles

For reliability and durability, the experience and know-how of the company producing Beaver turnstiles has been recognized in Canada for more than 60 years. Today that reputation is maintained on a growing world basis in the products manufactured and distributed under the Beaver trade name by Turnstile Control Systems (Canada) Limited of Mississauga, Ontario, Canada.

Countless transit terminals, grocerias, cafeterias, self-serve stores, libraries and industrial complexes in many nations move pedestrian traffic smoothly, efficiently and safely year after year with Beaver turnstiles.

All types and ranges of sophisticated yet rugged Beaver turnstiles and crowd control systems are available for directing, collecting and recording. Fare collecting equipment runs from simple single-coin or token-collecting devices to turnstiles operating in conjunction with computers (banked or central) for zoned fares, monthly passes or credit cards. Counting, recording and crowd control devices include three and four-arm turnstiles and high turnstile gates. All equipment is "over-designed" to avoid the multiplicity of breakdowns that can plague turnstiles. Every Beaver product is metic-

ulously made to the highest standards — parts are hand fitted — and the company is constantly assessing the changing needs of the industry to ensure its turnstiles fulfill their tasks in the most efficient manner possible.

### Among Turnstile Control Systems products are:

- **1000 Series**, four-arm Sentinel turnstile, designed for applications where pedestrian control is required, separates incoming and outgoing traffic to avoid jamming and delays and enforces traffic flow in one direction. A sturdy mechanism and heavy-duty lubrication ensure smooth, easy, maintenance-free operation.

- **2000 Series**, three-arm compact turnstile requires less floor space and provides features not available in conventional four-arm models. It can be placed conveniently by counters, walls or narrow entrances to control without restricting traffic flow.

- **3000 Series**, three-arm standard turnstile has all the features of the 2000 Series but requires slightly more floor space and provides a greater range of options. Available are mechanical and electrical controls, portable platforms and remote electrical registration. Smooth "feather-

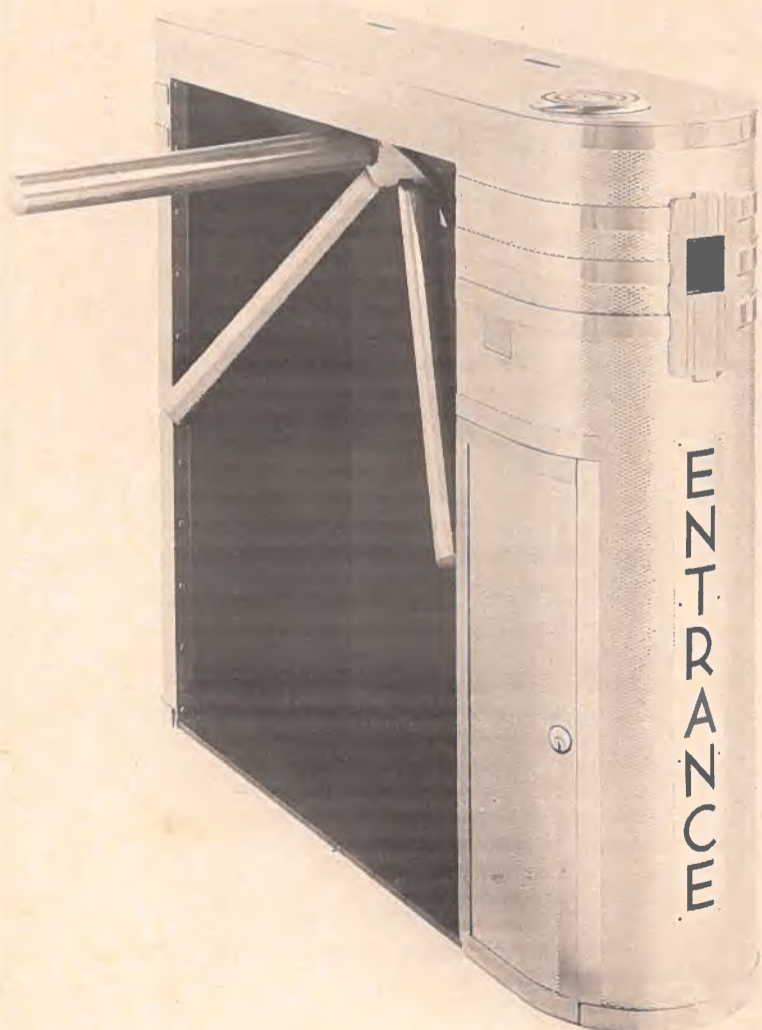
touch" arms, heavy-duty construction, and quiet operation enable these units to move 40 to 50 people a minute in safety.

- **4000 Series**, three-arm, coin or token-operated turnstile incorporates the features of the 3000 Series plus a tamper-proof registering counter, no-jam coin slot on the top cover and a built-in coin container protected by a locked steel door. The turnstile needs no attendant and can be set to operate with any chosen coin or token.

- **5000 Series**, high gate turnstile turns in one direction only to prevent re-entry and requires no guard or attendant. The rotating gate section has 36 stainless steel tubular arms securely locked into the vertical rotor shaft. The inside sweep is shielded with a formed steel skirt and entry from the top is prohibited by a ceiling plate.

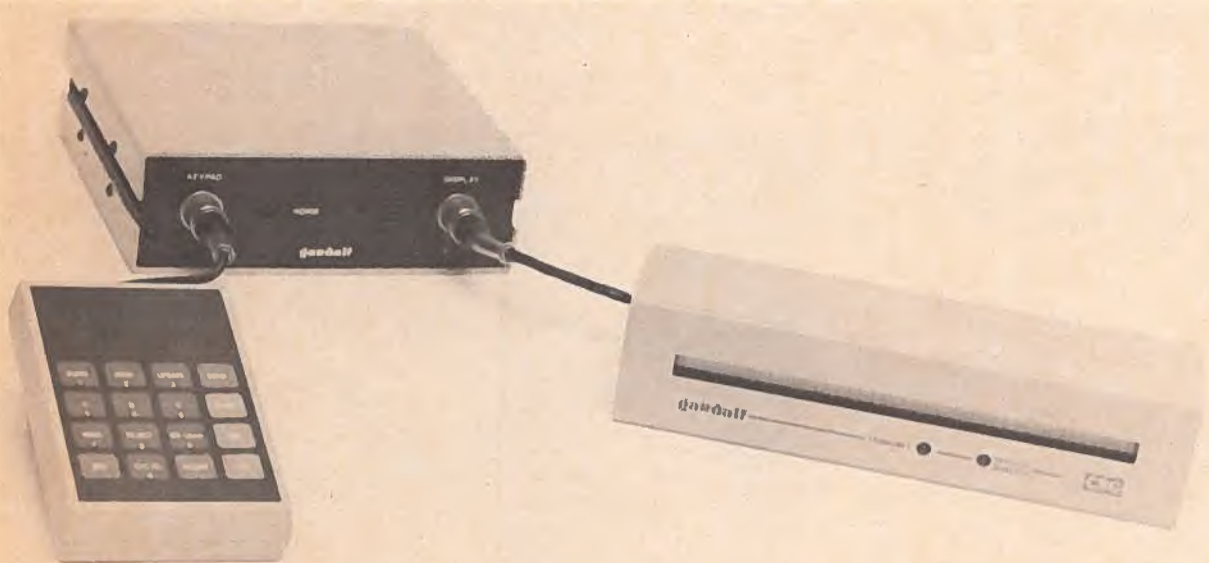
An aggressive and forward looking company, Turnstile Control Systems (Canada) Limited is making Beaver the accepted name in turnstiles worldwide.

**For further information, contact: Turnstile Control Systems (Canada) Limited; 1515 Matheson Boulevard, Mississauga, Ontario, Canada L4W 2P5; Tel: (416) 624-4549.**



Beaver coin-collecting 4000 Series turnstile.

## Computerized Dispatching cuts "Chatter"



The Gandalf mobile data terminal for taxis, part of a computerized taxi dispatch system developed by CSG, consists of a 16-key keypad, a microprocessor-based control unit and a 40-character display.

"Radio chatter" in taxis, distracting to drivers and exasperating to passengers, has been virtually eliminated thanks to a computerized network of mobile data terminals that makes voice communications between dispatcher and taxi unnecessary.

The system was developed by the Canada Systems Group (CSG) Advanced Technology Systems Division of Ottawa, Ontario, Canada, in collaboration with Ottawa's Blue Line Taxi. CSG selected Gandalf Data

Limited, also of Ottawa, to design the mobile data terminals needed for a fully automatic dispatching system based on digital technology and used over the existing radio channels.

The system reduces requirements for skilled dispatching personnel; improves efficiency by reducing non-productive mileage; gives better radio use (more vehicles per channel); virtually eliminates dispatching errors through its transmission system; improves driver's working envi-

ronment by cutting "radio chatter"; retains the last message received, reducing driver error.

In the development stages, the company faced design criteria that included compatibility with a wide variety of existing taxi radio equipment; operation over many weather and environmental conditions; built-in reliability and self-testing; minimum per car cost to ensure economic viability; efficient use of allocated radio space; simple input procedures for taxi drivers; in-taxi informa-

tion display that is understandable and easy to read under all conditions; compatibility with the differing types of cars used as taxis.

The resulting mobile terminal consists of three components — a microprocessor-based control unit; a 40-character display; and a 16-key keypad.

Specifically, the entire system hardware includes a Data General Nova 4X minicomputer; a 10-megabyte disc drive; magnetic tape unit; terminal/printer; video terminals for use at the dispatch centre by call-takers and supervisor; a communications subsystem including Intel microcomputers and Gandalf modems; and, ultimately, one mobile terminal for each taxi.

The system can handle 10,000 calls in a day and up to 1,500 dispatches per hour during peak periods.

For the taxi driver, operation of the system is simple and straightforward. When he comes on duty or finishes with a fare, he books into the system with a geographical location or "stand" number and the computer puts his car into a line-up for that stand.

When a call for a taxi in that stand area comes in, the first car in the line-up is contacted by a signal light and buzzer and the fare information is printed out. If the driver cannot accept the fare for one reason or another, the buzzer sounds for 30 seconds

after which that car is automatically booked off and a message left to that effect. The driver may choose to reject a fare and the computer will put him back to the bottom of the line-up. The next car in the line-up is then contacted for the fare.

On picking up the fare, the driver puts his meter flag down which sends an impulse to the computer notifying it of the pick-up. If there is no customer there, the driver pushes a "No Load" button and the computer puts his car back to the top of the line-up. On finishing with a fare, the driver books in again.

Back at dispatch centre, the call-takers handle initial customer calls and record all necessary information into the computer using a video terminal. The computer checks the address, determines which stand it is in and notifies the first car in the line-up for that stand.

All call records — by the shift or by the day — can be put on magnetic tape for permanent retention and the system can issue daily reports showing the number of calls by telephone operator, daily loading by stand and loadings by taxi.

**For further information, contact: Canada Systems Group Limited (CSG), Advanced Technology Systems Division; 1736 Courtwood Crescent, Ottawa, Ontario, Canada K2C 2B5; Tel: (613) 225-1711; Telex: 053-3661.**

## "Old Faithful" gets new articulated look



Newest addition to the General Motors of Canada Limited fleet of urban transit products is the articulated bus, an adaptation of GM's New Look transit coach affectionately known as "Old Faithful". Two New Look shells have been successfully married to form the basis of the articulated bus. They are tied together by a proven push-type turntable that: provides control over the relative lateral motion between the front and rear sections of the coach under normal driving situations; gives full damping action restricting lateral motion at highway speeds; and provides anti-jackknife protective control.

The New Look transit coach from General Motors of Canada Limited has been affectionately referred to as fishbowl and silversides. But under present market conditions, perhaps the most apt is "Old Faithful".

The well-documented qualities which earned Old Faithful its name — proven performance, excellent reliability and maintainability and comparatively low operating and maintenance costs — were the very features that encouraged General Motors to utilize the New Look as an excellent basis for the development of a new articulated coach.

In 1979, Diesel Division undertook the design and development of such a coach. The desire was to create a product which retained all of the excellent features of the current bus, while updating it both cosmetically and through the addition of modern state-of-the-art features.

The starting point for the new unit involved the use of two currently produced New Look shells. A 10.7 m (35-ft.) unit from the rear axle forward formed the

leading unit while a 12 m (40-ft.) coach, minus the front section, formed the trailing portion. To tie this structure together, a proven push-type turntable, designed by the Schultz group of the Federal Republic of Germany, was selected. The advantage of a push-style turntable is that it allows the DDA engine and Allison automatic three-speed transmission to remain in their conventional transverse position at the rear of the unit, just as in any existing New Look coach. As a further design criteria, a new front end structure offers a dual stream entrance door and provides a more modern appearance for Old Faithful.

The greatest benefit of the articulated coach is that, except for the turntable and the body panels of the front end, the unit remains similar to a current New Look coach. As such, the bus represents a proven structural design well-known to transit properties across North America.

A large majority of the parts on the articulated vehicle are interchangeable with parts used

on current New Look coaches. The engine, driveline components, electrical equipment and heating equipment all remain in their same locations. Due to this commonality of systems and parts and the use of the well-known engine, transmission and driveline components, little retraining of mechanics and maintenance personnel is required. As well, a minimal increase in parts inventory would be necessary.

The prototype coach is undergoing exhaustive testing for durability and structural reliability as well as for all-weather operation.

This prototype unit, for use by Mississauga Transit, is the first of 53 coaches ordered by the Ministry of Transportation and Communications Division of the Government of Ontario.

The GM articulated coach seats a maximum of 76 passengers, depending on the seating arrangement requested. A wide range of seats from several manufacturers is available.

While the main standard features of the articulated coach remain similar to those available

on the New Look coach and while the basic design concept (monocoque construction) and appearance are carried over to the articulated unit, a whole new design philosophy was embraced in the consideration of the articulated unit.

One of the main concepts of a high-capacity bus is the transportation of the maximum number of passengers in the quickest fashion using the minimum amount of resources. Thus three double wide doors are included in the coach design. Along with the inclusion of the wide doors, an attempt was made to maintain the maximum seating capacity and maximum usable interior space. The room for the double width front door was gained through more efficient design of the front end components.

In order to maintain these design parameters and to assure a reliable efficient product, several new features were incorporated into the new bus.

### Schultz Turntable Arrangement

Perhaps the most important design feature is the push-type turntable arrangement. The importance of the turntable is that it controls and secures a pivoting angle which is always proportional to the steering wheel angle. Even in the most extreme driving situations, such as wet or icy streets, it assures prevention of an unacceptable enlargement of the pivot angle between the front and rear part of the coach. This anti-jackknife protective control works automatically and without time delay and eliminates the possibility of driver error due to road conditions or other reasons related to the control of the articulated section.

The turntable fulfills three major functions within the operating conditions of the coach. First, it provides control over the relative lateral motion between the front and rear sections of the unit under normal driving situations, always keeping the angle between the two sections to less than seven degrees. Second, the turntable provides full damping action restricting lateral motion to plus or minus 10 degrees at highway speeds. Finally, it provides the anti-jackknife

control. When the anti-jackknife protective control is in operation (during all forward motion), a light on the dashboard informs the driver.

A benefit of this style turntable, besides the obvious advantage of excellent stability, is the fact that the engine and transmission remain in their conventional locations at the rear of the coach. This factor allows the use of the familiar 8V-71N DDA engine and an Allison transmission. For example, the power pack could in effect be removed from a 12 m (40-ft.) coach and installed in place of the power pack in the articulated unit. Thus, again, no mechanic retraining or special spare parts are required for the power pack.

### Wide Doors

To ensure rapid passenger movement on and off the coach, wide doors have been provided at three locations on the bus. In the front of the coach, the double width front entrance is obtained through more efficient use of front end space. No passenger capacity is lost and extra room is provided for the driver. For proper passenger control, the forward section of the 106.7 cm (42-in.) wide front door can be opened separately or the entire door can be opened at once. The front door is a slide-glide type with two separate Vapor differential style engines.

The middle and rear doors are 114.3 cm (45 in.) wide and also designed with an eye towards maintaining maximum passenger capacity. Both doors are four leaf outward opening type and are treadle operated on the Ontario order. The door control is by a five-position switch located on the driver control panel.

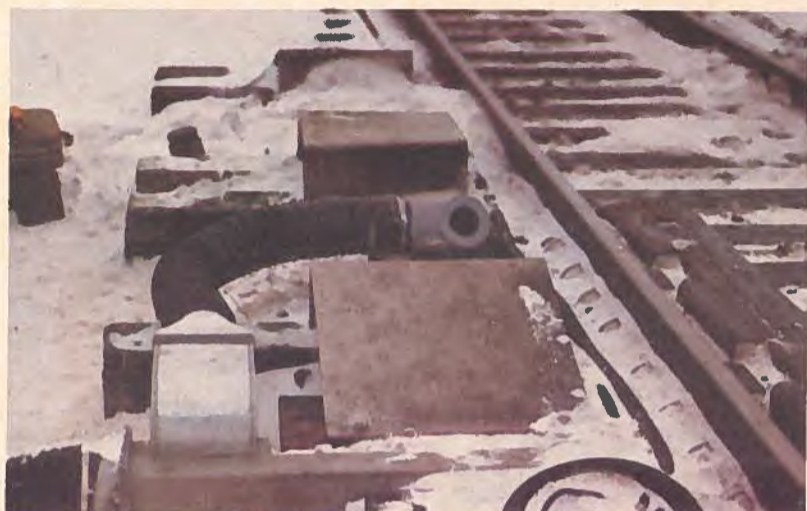
Each of the three doors may be opened separately (including the forward leaf of the front door), any combination of the doors may be opened, or all doors may be opened at once.

**For further information, contact: Diesel Division, General Motors of Canada Limited; P.O. Box 5160, 2021 Oxford Street East, London, Ontario, Canada N6A 4N5; Tel: (519) 452-5000; Telex: 064-7231.**

## Cold weather transportation systems warm to products from Hovey & Associates Ltd.



The horizontal air curtain  $\Delta$  and the hot box detector protector system are just two of the units manufactured by Hovey & Associates (1979) Ltd. of Ottawa, Ontario, for cost-effective use by the rail transportation industry.



Hovey and Associates (1979) Ltd., is an Ottawa, Ontario-based medium technology engineering company with a consulting, prototyping, test and custom manufacturing capability. Products include transportation-oriented items designed to solve many cold weather problems of rail and air transport.

For example, their horizontal air curtain switch protector units and associated snow detector system were developed to meet the need for an energy efficient system of preventing railway switch freeze-ups due to ice and snow deposits in the switch. These units have proven to be the most cost-effective systems used by the railroads today. The two styles of switch protectors utilize an envelope of high velocity air at ambient temperature to prevent the accumulation of ice and snow. The use of ambient temperature air eliminates the problems normally associated with thermal units and in so doing significantly reduces

energy consumption and greatly increases reliability. The horizontal air curtain units essentially consist of a blower unit and the necessary ducting to deliver a flow of high velocity air 161 km/hr (approx 100 mph) into and over the track and switch mechanism thus preventing the entry of falling or blowing snow or rain into the switch. An induced secondary air flow produces a vortex action which cleans underneath the heads of the rail and between the ties.

The associated snow detector unit is a fully automatic electronic moisture detection system designed to initiate the operation of the horizontal air curtain automatically at the onset of snow or freezing rain. This adds greatly to the energy efficiency of the unit.

By actuating the horizontal air curtain automatically and only when necessary, the human element is avoided — thereby ensuring clear switches at all times, further reducing energy consumption and prolonging the

life of the horizontal air curtain units. In essence, it is now possible to "set it and forget it" thereby realizing, automatically, the absolute in energy savings. Although designed to use ambient temperature air, the horizontal air curtain point end nozzle unit may also be fitted with complementary add-on compact and highly efficient electric or propane heaters for unusually severe conditions. By the addition of either heater, railway switch operation obstructed as a result of severe and abnormal conditions such as snow build up during power failures, impacted snow caused by snow plows, shunting over switches and snow slides from steeply sloped peripheral terrain, can be quickly recovered without the use of manual labour. In contrast to most hot air systems, the horizontal air curtain electric or propane heater system does not create any ice build up in the switch as the combination of heat and high velocity air movement vaporizes the ice and snow rather than merely melting it.

Additionally Hovey & Associates (1979) Ltd. manufactures a Hot Box Detector protector system. Despite the excellent design and existence of hot box detectors on the track, undetected hot box situations still exist because the detector is often unable to see and record hot boxes because its sight and sensing path is obstructed by ice, snow or sand. The hot box detector protector unit designed, developed and manufactured by Hovey & Associates (1979) Ltd., prevents such situations and assures a clear sight path for the detector unit at all times, under the worst conditions.

For the air industry the company manufactures a trailer-mounted aircraft ground heater unit capable of delivering 460,000 BTU. A single ground heater unit is adequate for the smaller jet aircraft. Two such units used in tandem are adequate for the wide-bodied jumbo jets. Hovey & Associates (1979) Ltd., also manufactures a self-contained, self-propelled aircraft de-icing unit, which also embodies a maintenance work platform as well as a mobile crane capability for greater utilization in aircraft maintenance.

**For further information, contact: Hovey & Associates (1979) Ltd., 2378 Holly Lane, Ottawa, Ontario, Canada K1V 7P1; Tel: (613) 731-1200; Telex: 053-4922.**

### Their own best ad

## Transit shelters bearing the images of success



"Pay-their-way" transit shelters from Daytech literally do just that — they pay their own way. One end wall of the shelter can be fitted as a full-length, illuminated advertisement that can be seen with equal ease by transit users inside the shelter, passing pedestrians or motorists . . . and they generate revenue from the sale of the advertising space.

In a growing number of towns and cities across Canada, attractive, high-quality, vandal-resistant transit shelters are offering a unique advantage — they don't cost the municipal government a thing and even generate revenue. Another winner is the transit user who feels safer in the shelters while enjoying protection from the elements and getting a more attractive streetscape.

A number of special features contribute to the success of the shelters, designed and manufactured by Daytech Mfg. Ltd. of Downsview, Ontario, Canada. They are illuminated inside for safety and enclosed on three sides by extremely tough 10 mm (0.4 in.) tempered glass for comfort. The roof is of two layers of fiberglass reinforced plywood with a core of high-density urethane foam and is virtually vandal-proof. Strength comes from the hollow structural section (HSS) frame of 4.7 mm ( $\frac{3}{16}$  in.) thick, 7.6 x 7.6 cm (3 x 3 in.) steel tubes.

The fourth wall is the key to the money-saving and revenue-generating feature of the Daytech shelters. This is a double-sided, illuminated display wall that fits either end of the shelter and is ideal for full-sized, imaginative advertising. The ads can be seen by shelter users from inside, by passing pedestrians from outside and, because of the size and illumination, easily seen by motorists driving by.

Where Daytech shelters are already in use, sale of this prime advertising space has helped pay for the shelter programs and is

bringing in increasing amounts of revenue. It has been described as "a logical and practical extension of outdoor advertising" and advertisers are finding it so successful that they are coming back for more and asking for long-term commitments after trial runs.

Daytech also provides shelters without the advertising wall but with all the other outstanding features for conditions in which all-round visibility is a necessity.

Another money-saving factor of the shelters is that maintenance costs are cut by at least 50 per cent, partly because of the extremely durable two-component polyurethane finish on all parts and partly because the structural design has considerably reduced vandalism.

Performance reports also state that the using public feels safer in Daytech shelters because of their open nature plus the solid strength of the heavy structural members.

An enterprising company that has been in business since 1907, Daytech Mfg. Ltd. (formerly known as Day Signs Ltd.) designed its shelters in response to the needs of one of Canada's largest cities, Toronto. Manufacture started in 1979 and the success of the shelters has been such that they can now be found, with or without advertising, across Canada.

**For further information, contact: Daytech Mfg. Ltd.; 675 Petrolia Road, Downsview, Ontario, Canada M3J 2N6; Tel: (416) 661-2696.**

## Vancouver Site of First World Exposition on Transportation

It seems only fitting that Vancouver, western terminus of Canada's first transcontinental railway, should be the site of the first world-class exposition devoted to transportation. From earliest days, our vast and often hostile country and small population have made Canadians uniquely reliant on all forms of transportation.

While the opening of the five-month exposition is almost five years away, the organization responsible (the **TRANSPO 86 Corporation**) is busy working to ensure its success. The 13-member Board of Directors has been chosen, the 60 hectare (130-acre) site acquired and the management structure under Commissioner General Patrick Reid (currently president of the Paris-based International Bureau of Expositions) is now in place.

**TRANSPO 86** will be organized with care, commitment and

consideration for international participants, private corporations and visitors alike. As a special category world exposition, it will be on a smaller scale than the "universal category" expositions of Montreal and Osaka, but the quality of the experience and the relevance and timeliness of the subject will ensure that **TRANSPO 86** will be equally memorable.

Together, the governments of Canada, the Province of British Columbia and the City of Vancouver have undertaken the detailed preparation and development of the exposition.

The Corporation is empowered to carry out all the financial and operational tasks necessary to plan and implement a successful world exposition.

Participating nations are invited to join with the Commissioner General of the Exposition in the early planning of this uni-

quely co-operative endeavour. The direction and scale of their involvement will be instrumental in shaping the parameters of the exposition as well as its success in reflecting the diversity and richness of available human and technological resources.

Provincial and state governments, international organizations, corporations and prospective concessionaires are also encouraged to begin planning as early as possible. Some corporations and organizations may wish to sponsor supporting activities which will encourage innovation, invention, artistic and sports endeavours in the context of **TRANSPO 86**. The **TRANSPO** planning teams will work closely with organizations considering participation. They will be able to identify the most appropriate opportunities and provide specific counsel to participants.

Because of the high level of

interest, convention planners and those organizing conferences and seminars on transportation are urged to reserve space in Vancouver as soon as possible.

**TRANSPO** staff can assist by directing organizers to one of the several agencies who can make the necessary arrangements.

Research establishments, scientists and technicians, inventors, futurists and academics are expected to focus on 1986 as a logical time to present their latest thinking and inventions in the uniquely receptive and widely publicized environment of a world exposition through symposia and professional conferences.

At **TRANSPO 86** journalists, writers, publishers and producers of film and other audio-visual materials will have a unique opportunity to examine the problems and potentials of transportation and to disseminate their findings internationally.

For the young, **TRANSPO 86** will offer a tantalizing glimpse of both the past and the future. For the businessman, it will be a showcase of time- and money-saving ways to move goods and people. For the scientist and technician, a laboratory packed with possibilities.

More than this, it will be a celebration of universal achievement on land, on water and in the air. And an opportunity for artists and performers to capture the beauty and romance of man's travels.

**Further information on the 1986 World Exposition may be obtained by writing —**

**TRANSPO 86**  
P.O. Box 1986  
Station A  
Vancouver, British Columbia  
Canada  
V6C 2X5  
or telephone — (604) 689-1986