

# Canadian expertise reflected

Canada is a huge country with a small population. It is 3700 miles wide and stretches more than 3000 miles from north to south, yet it is shared by just 25 million people. The result is that transportation and communications — the twin themes of Expo 86 — have always been extremely important in linking the various parts of the country together. And that, in turn, has meant that transportation and communications are two areas where Canadians have developed a special expertise which is second to none.

Below, we present a brief look at just two of the areas where that expertise is particularly well established: rapid transit in transportation, and cellular radio in communications.

## Canadian firms world leaders in rapid transit technology

Modern rapid transit moves large- and medium-size populations efficiently, quickly and safely. Canadians have acquired a broad range of rapid transit experience, which spans the steel-wheel/steel-rail system in Toronto and the rubber-tyred Métro in Montreal.

The Montreal system operates in a completely closed environment. The rubber-tyred suspension permits safe, reliable acceleration and braking on grades up to 6.5 percent. Because trains are closely spaced and make frequent stops, the cars — built by Bombardier Inc — are equipped with four double doors per side to allow rapid passenger exchange. Stopping time at stations can be as short as ten seconds.

Toronto's subway is based on steel-wheel technology, which permits the system to operate reliably during winter months in open sections. Except for the first 140 cars, all Toronto Transit Commission stock has been manufactured in Canada.

Toronto's most modern cars were built by the Canadian Car Division of Hawker Siddeley Canada Inc. In 1984, this division became a wholly owned subsidiary of the Urban Transportation Development Corporation (UTDC).

The two major Canadian manufacturers — Bombardier Inc and UTDC — have an on-going commitment to improving rapid transit and bringing the systems of the future to today's cities. Both are recognised worldwide as transit industry leaders.

### Bombardier Inc

Bombardier's business is the design, development, manufacture and marketing of transportation-related equipment and products: mass transit vehicles, engines, military trucks, all terrain tracked vehicles, motorcycles and snowmobiles.

The range of its rail transit vehicles enables it to meet the needs of the three major mass transit sectors: urban, suburban and intercity transit.

As a result of manufacturing license agreements concluded with European, Japanese and US manufacturers, Bombardier holds the design and manufacturing technology related to the production of all urban transit equipment — people movers,

rubber-tyred subway cars, steel-wheeled subway cars and light rail vehicles — as well as suburban transit equipment such as bi-level self-propelled commuter cars and commuter train coaches.

For intercity transit, the company — in cooperation with two other Canadian corporations, Alcan and Dofasco — has developed the only higher-speed passenger train of North American design, the LRC train (Light, Rapid and Comfortable). The LRC train is also one of the few higher-speed trains in the world that is designed to be operated on existing railway tracks, thus cutting substantially the investment required to put it into service.

In North America, Bombardier has two assembly plants for the production of mass transit equipment: one at La Pocatière, Quebec, the most modern of its type on the continent, and the other, built in 1981, at Barre, Vermont.

In 1982, Bombardier was awarded a contract valued at \$1 billion to supply the Metropolitan Transportation Authority of New York with 825 steel-wheeled subway cars. This order, the largest export contract ever granted a Canadian manufacturer, earned for Bombardier a place high among the leading manufacturers of mass transit equipment.

### UTDC

The UTDC and its subsidiaries have recently completed (or are completing) contracts for several major rail projects: 126 subway cars for Toronto; 54 subway cars for Boston; 50 double-ended articulated light rail vehicles for Santa Clara County; 50 articulated light rail vehicles for Toronto; and intermediate capacity Advanced Light Rapid Transit (ALRT) systems for Detroit, Toronto and Vancouver.

Together with Bombardier the company is also participating in a project to provide double-decker passenger rail cars for VIA Rail Canada Inc.

UTDC's activities are centred at its Transportation Development Centre (TDC) near Kingston, Ontario. This 480-acre site is home to over 800 engineers, technicians, scientists, mechanics, assemblers, researchers and support staff. The TDC is the only major facility in North America, devoted solely to the development and testing of transit systems and their major components.

The TDC also provides both operators and manufacturers with the facsimile of a transit operating environment for testing vehicles and equipment and for training personnel without disruption of revenue service. For example, the TDC has a fully-equipped training centre, which is being used to train its ALRT customers in system operation.

The ALRT system — designed, developed and built by UTDC — runs, for the most part, on slender guideways elevated six to eight metres above congested automobiles and buses. Compact, lightweight cars on steel rails are powered by Linear Induction Motors (LIM). These advanced motors have no moving parts, thereby reducing maintenance. They work by creating an electromagnetic field that reacts with an aluminium-iron alloy plate placed between the two rails. To change speed or direction, operators simply change the power level or reverse the electric field. UTDC's ALRT system is the first application in the world of LIMs in transit service.

