

## Skytrain: Vancouver's Rapid Transit System

### At Expo 86

All six members of ASEAN are present at Expo. The pavilions are located near the centre of the exposition ground on the Marine Plaza. Each of them brings with it a touch of the East. Singapore's, for example is reminiscent of the shop-houses once common in the Republic and has for its theme 'Surprising Singapore'. The entrance to the Malaysian pavilion is surmounted by a wooden arch in traditional style, while inside a Proton Saga invites closer examination. The other ASEAN pavilions also demonstrate the diversity of people, resources, and culture present in the Region.

Official visitors are also a part of the Expo celebration. Among the guests expected are Crown Prince Maha Vajiralongkorn from Thailand; Singapore's Education Minister Dr. Tony Tan; the Philippines Minister of Natural Resources Ernesto Macedo; Pengiran Bahran, Minister of Law and Communications for Brunei; and from Indonesia the Minister of State and Chairman of Central Planning Agency, Johannes B. Sumarlin and the Minister of Communications, Roesmin Nurjadin.

Expo '86 is a gathering of nations. With its theme of transportation and communications, it shows that the world is becoming smaller and increasingly inter-dependent every day. With its location in Vancouver, it also represents Canada's commitment to the world at large and to the Pacific Rim as well as embodying Canada's confidence in herself and in her technology. Expo '86 will be an event that visitors will remember for years to come.



*Fancy-painted Filipino buses add additional colour to the Philippine exhibition.*



*Vancouver's Skytrain, a light-rail transit system designed and built in Canada.*

In 1986 the world is coming to Vancouver to attend Expo '86, an international exposition celebrating achievements in the fields of transportation and communication. Many of the millions of expected visitors will arrive at the site on one of the world's largest fully automated urban transit systems — Vancouver's recently completed Skytrain.

The Canadian-developed and manufactured Skytrain system was completed on schedule and on budget for \$854 million in January 1986. The light rapid transit system runs for 21.4 km (13 miles) from Vancouver's downtown core to its suburbs. Skytrain's gleaming white, blue and red cars travel underground through Vancouver's downtown for a distance of about 1.9 km (1.2 miles), then rise for the remainder of the line on an elevated structure.

Designed by the Urban Transit Development Corporation of Ontario, Vancouver's new transit system features a major technological innovation with the introduction of the Linear Induction Motor (LIM). The LIM is essentially a two-metre long electric motor stretched out flat. Unlike a conventional electric motor which uses an electric current to create a magnetic field to make an iron rotor spin and turn a shaft connected to the wheels, LIM produces forward motion without this conversion.

An alternating electric current surges through copper wire in the LIM and produces a complementary current in a metal plate alongside the rails. The two currents are not in step, one constantly behind the other, thus two magnetic fields attract each other and try to join together, but never quite make it. Instead the motor slides along above the steel

plate and pulls the train with it.

The LIM needs no gear or transmission because it acts independently of friction between the train wheels and rails. For limited braking the motor turns into a generator absorbing the momentum of the vehicle until the mechanical braking system kicks in below 10 km (6 miles) per hour. (There is also an emergency magnetic break which clamps onto the running rails.)

Skytrain's steerable axle-trucks allow wheels to follow rails on curves rather than scraping against them, reducing friction, noise and wear on wheels. The steerable truck feature decreases wear on wheels to one-fifth that of conventional systems, while extending the life of curve rails by an estimated 10 to 20 times, a considerable cost saving.

Skytrain combines the assured all-weather acceleration and breaking characteristics of the LIM with fully automatic, driverless train control.

The system's total cost stacks up well in comparison with others in North America. On a cost per kilometre basis, Skytrain is the cheapest transportation system in North America.

When Skytrain opened in January 1986, the system carried 10,000 passengers per hour in each direction. As the metropolitan area of Vancouver grows and as the transit line is expanded, Skytrain is expected to triple its capacity, transporting 30,000 riders per hour each way along its route.

There are 54 exhibits from countries around the world at Expo '86. As visitors arrive at the Expo site aboard the Skytrain, they may find that the best and biggest exhibit of all is the transportation system that got them there.