in Expo 86's twin themes

ALRT system operates automatically without driver or guard.

The ALRT vehicles are quiet — creating less noise than a diesel bus. This is because of their motors, and because each vehicle has steerable axles that virtually eliminate the squeal and grinding normally made by rail vehicles with rigid axles. Also, the rail is continuously welded to reduce the traditional 'clackety-clack' of railways. The patented UTDC steerable axle trucks are the first application in the world of this advance in transit service.

The ALRT system operates automatically without a driver. Closed circuit TV monitors station activity and if any emergency arises each car is equipped with an alarm system. Information on speed and position comes from micro-computers on board each train transmitted to a Central System Management centre.

The centre automatically receives and verifies commands from the vehicle control computer and issues instructions for the braking or propulsion. Dispatchers in the control centre monitor train movements and passenger security.

Residents of Vancouver were the first people to sample the futuristic delight of the ALRT system, when a demonstration service began in 1983. A full ALRT system will be operating throughout Vancouver by January 1, 1986 — in time for Expo 86.

Cellular radio a leap forward in mobile telephone service

The introduction of microprocessors and digital technology in the telephone network may be one of the most important technical advances in the telecommunications field in the last decade, but the most significant development in mobile telephone services is without doubt cellular radio.

In Canada, cellular radio equipment will be designed and produced by companies such as NOVATEL, an Alberta-based corporation. Also, Northern Telecom, Canadian General Electric Co, and Motorola Canada will be involved in supplying equipment and marketing services.

Cellular radio is expected to attract up to 130 000 Canadian subscribers within the next five years. This rapid growth can be attributed to improved service levels, North American standardisation that will result in widespread service availability, a greater variety of service offerings and applications, and reduced cost of the mobile unit.

The creation of cellular radio networks will involve an investment of approximately $500 million, and an additional $300 million will likely be spent on the acquisition of cellular radio equipment.

First systems were manual

The first mobile telephone systems were essentially 'manual' in operation. A caller would use a switch to select a radio channel. Next, he would identify himself verbally to the telephone operator and state the telephone number required. This manual operation might have been acceptable if combined with rapid access to a radio channel. In practice, however, only 12 channels were available in the 150 MHz VHF radio band, restricting the number of possible simultaneous conversations in any given region to just 12.

By the end of the 1970s, an automatic system using the 450 MHz UHF band became available in certain areas of Canada. This offered an alternative to the user who desired automatic dialling without operator intervention. However, the new system never had the success expected, as it too was limited to the use of only 12 channels.

Cellular radio makes use of some 600 radio channels in a new higher frequency band designated for its use (800 MHz). The large number of channels available for cellular service is itself a major advance. But the greatest advance of cellular radio is the new concept of dividing the channels among a number of small geographical areas, or 'cells'.

In a conventional radio-telephone system, a powerful transmitter located at a high point in the centre of the service area is used to communicate with the mobile telephone. The same channel cannot be used for more than one conversation within the area covered by the transmitter.

However, if the same territory is divided into small geographical areas or cells with a low-power transmitter serving each cell, then each channel can be used simultaneously within other cells, provided that two cells using the same frequency are separated by other cells. As well, each cell can be further subdivided, if warranted by mobile telephone service demand in that particular cell.

The large number of channels shared and re used among the various cells in an area gives cellular radio virtually unlimited mobile service capacity. Calls from each cell are controlled by a central computer that handles all cells in a given service area. Along with other tasks, the computer ensures that a mobile telephone crossing a cell boundary is transferred to the frequency associated with the adjacent cell.

Thus, vehicles can move throughout a service area without interrupting a conversation. The computer will automatically transfer the call from one cell to another without the user being aware of it.