Canadian carriers. On a per capita basis, this system is the most extensive in the world, stretching across land and water from the east to west coasts, with branches north and south extending into virtually every community.

14.2.1 Carriers

Canada's telecommunications carriers own and operate the networks, equipment and services of the Canadian telecommunications systems. Most of these carriers are privately owned, though a significant number are publicly owned. All are required by law to carry user calls, messages and other information at a reasonable cost without changing their content.

Most of the carriers are telephone companies, though they do not restrict themselves to telephone services. The size of their plants, all the equipment and buildings they own and operate, has been growing all the time (Table 14.1). Between 1975 and 1982 plant cost doubled from a little more than $11.4 billion to almost $24.5 billion. Over half of this — more than $13.5 billion worth — was expended in Ontario and Quebec (Table 14.2). Across Canada, the telephone companies spent nearly $2.9 billion on construction in 1982 and more than $2.8 billion in 1981 (Table 14.1). These figures do not include construction expenditures and plants of carriers exclusively engaged in carrying telecommunications services other than telephone. A significant proportion of this expenditure across Canada went into the deployment of new computer and communications technologies.

Another indication of the economic significance of the industry: the telephone companies employed more than 105,000 people and paid out almost $2.9 billion in salaries and wages during 1982 (Table 14.2). Wage and salary payments nearly doubled between 1977 and 1982 (Table 14.3).

Telecom Canada, previously known as the TransCanada Telephone System (TCTS) has been responsible for a national network joining regional networks of 10 telecommunications companies across Canada, including six privately-owned companies and three companies owned by Alberta, Saskatchewan and Manitoba provincial governments. The tenth member, Telesat Canada, operates Canada's satellite communications system; it is jointly owned by the federal government and other Telecom Canada members.

Telecom Canada and its members, long active in the Geneva-based International Telecommunication Union, has attempted to secure, with DOC, the compatibility of the Canadian telecommunications system with those of other countries.

CNCP Telecommunications, another major carrier, provides telecommunications services across Canada in competition with Telecom Canada. Until March 1980, CNCP was composed of Canadian National Telecommunications and Canadian Pacific Telecommunications, each operating independently in many areas. In 1980, the two formed a partnership to unify their telecommunications services other than telephone and to effect economies.

The Canadian Telecommunications Carriers Association (CTCA) was the other framework for co-operation among carriers. It reduced the scale of its activities in 1981, especially its co-ordinating function for the International Telecommunication Union, but still undertook projects of common interest to its members, such as technical co-ordination studies with the Canadian Electrical Association to minimize inductive interference from electrical power lines. CTCA members included CNCP Telecommunications, Telecom Canada, most Telecom Canada members, the Canadian Independent Telephone Association, Teleglobe Canada (Canada's international carrier), the Canadian National Railway Co. and five other telephone companies.

14.2.2 Telecommunications networks

New technology has been gradually transforming Canadian telecommunications. For example, analog communication (in which signals travel in continuous waves) was being replaced by digital communication (in which signals are transmitted in discrete pulses). The digital mode uses computer language and is able to carry more information and is less subject to interference than the analog mode. Introduction of digital and computer technology into telecommunications heralded the possibility of vast telecommunication networks, compatible with each other and with all terminal equipment, and capable of automatically routing vast numbers of signals.

Fibre optics transmission systems are replacing copper cable in many carrier networks, generally in applications where distance is short but traffic heavy. In Saskatchewan, a $60 million fibre optic broadband network is being installed to link 52 major communities. The new network is capable of carrying voice, video and data traffic, with a top capacity of 12 video channels or their equivalent. The fibre optics cable is planned to extend for 3 200 km and enclose 38 million metres of optical fibre — more than had been produced in the entire world up to 1980. The target date for complete installation was 1985.

The backbone of Canada's telecommunications networks is still, however, three nation-spanning microwave networks. These networks consist of microwave stations about 50 km apart, which relay radio signals, amplifying them along the way. In general, each microwave channel could carry more than 1,200 telegraph, data or telephone signals or one TV circuit. Telecom Canada owns and operates two of these networks. CNCP Telecommunications operates the third.