

communications department (DOC) has been sponsoring field trials for direct-to-home broadcasting and the delivery of information and education services to remote areas. DOC also carried out studies to provide mobile radio and television and radio broadcasting services. A Canada centre for remote sensing in the energy mines and resources department is receiving and processing data from satellite systems giving information about the earth's surface, for application in agriculture, forestry, water resources, ice reconnaissance and oil and mineral exploration. The federal environment department operates a network for reception and distribution of data used in preparing forecasts of weather and ice conditions. Another non-communications application was an interdepartmental project established in 1977 to determine the feasibility of using satellites to help meet surveillance needs for Canada's extended coastal zones of 200 nautical miles. The project included participation in a complementary US satellite program and consultation with potential international partners.

In the foreign sphere, an agreement of co-operation between Canada and the European Space Agency (ESA) came into force in January 1979. Contracts in general studies and basic technology have been awarded to Canadian industry. DOC has an industrial contract fund to support Canadian industry in producing satellite sub-systems and components; value of contracts is divided equally between work for satellites and work related to earth terminals.

The other broad category of the government's space activities, space research, is conducted by NRC. A six-year co-operative space science program with NASA was approved. Objectives were: to sustain and improve Canadian research competence in the space sciences, to provide new knowledge needed by Canada for decisions on the future use of space, and to train young scientists and engineers in a variety of space disciplines and share with NASA the generation of new knowledge.

14.1.13 Transportation

As explained in Chapter 15, Transport Canada is responsible for the efficiency and safety of the extensive and diverse transportation system in Canada. Major considerations are the current state of existing systems and the major capital expenses required for new systems. Data gathering is among related scientific activities necessary to assess accurately the existing transportation capabilities and to predict future requirements. Transportation-related science and technology is conducted by a number of federal departments, co-ordinated by an interdepartmental panel of transport research and development.

The energy, mines and resources department is involved in construction requirements and routing of land transport systems, development of materials and alloys for vehicles, rails and wheels for improved wear and materials for arctic application. The fisheries and oceans department charts inland and ocean waters. The environment department carries out related scientific activities in meteorology, seastate and ice forecasting.

NRC is a major contributor to R&D in transportation engineering. Studies have included use of rail cars at higher speeds with increased loads and use of air cushion vehicles for off-road surface transportation. The latter led to development of an air cushion platform attached to the bows of vessels to improve ice-breaking capabilities. Alternative types of fuel and propulsion are being studied. On-going research into arctic shipping is related to development of energy resources in the Arctic islands.

Two projects being conducted in industry, cost-shared by the industry trade and commerce department are: development of a new diesel locomotive to replace those developed 25 years ago and new methods of maintaining high quality track to enhance handling capability and safety of rail systems.

The defence department co-operates with Transport Canada by providing facilities and technical support in road research and studies related to vehicles, search and rescue, ship reliability and marine propulsion.

Urban transportation is primarily the responsibility of provincial and local governments. However, the federal government is involved through its concern for industry, specifically the urban transportation equipment manufacturing industry, not only to supply the domestic need but for export.