vessel movements on these waterways and traffic data for them are not included in this Section. Major construction undertaken in 1967 on the channel to bypass the city of Welland is scheduled for completion by the navigation season of 1973.

Seaway traffic. Tables 15.23 and 15.24 give combined traffic statistics for the St. Lawrence and Welland Canals in 1970 and 1971. Duplicate transits are eliminated so that the figures show the actual total movement of goods through the St. Lawrence Seaway.

In 1971, 4,200 ships carrying about 28.2 million tons of cargo moved upbound through the Seaway and 4,228 vessels carrying 42.6 million tons moved downbound. Ocean-going ships carried 29.6% of the total cargoes and lakers 68.5%. Of the total tonnage carried upbound in 1971, 19.9 million tons were domestic cargo and 8.4 million tons were foreign traffic; downbound, 31.7 million tons were domestic freight and 10.9 million tons were carried to and from foreign ports.

On the Montreal - Lake Ontario section, upbound traffic amounted to 26.0 million tons in 1971 and downbound traffic to 26.9 million tons, an increase of 3.5% over 1970. Almost 51.6% of the former was accounted for by iron ore shipped from St. Lawrence ports to Hamilton and Lake Erie and the downbound traffic consisted largely of overseas shipments of wheat. There were 100 fewer upbound transits and 121 fewer downbound transits in 1971 than in 1970 indicating a slight decrease in the number of vessels using this portion of the Seaway. Bulk commodities comprised 83.8% of the total traffic through the section in 1971, the principal commodities through the St. Lawrence canals being iron ore, wheat, manufactured iron and steel, barley, corn, soybeans and fuel oil. Traffic patterns show that 34.3% of the total movement was between Canadian ports, 29.2% between Canadian and United States ports, and 36.4% consisted of foreign trade to and from Canada and the United States. The small remainder was traffic between ports in the United States.

There were 6,854 transits through the Welland Canal in 1971, with a cargo volume of 21.6 million tons upbound and 41.3 million tons downbound; bulk cargo accounted for 87.4% of the traffic. Although many vessels pass through both the St. Lawrence and Welland Canals on "through" trips, there is a substantial amount of local traffic between Great Lakes ports which involves only the Welland Canal. These movements are largely of iron ore, grain and coal. The Welland Canal traffic was 10.0 million tons greater than that reported for the Montreal - Lake Ontario section.

Income of the St. Lawrence Seaway Authority for 1971 amounted to $27.8 million comprising toll revenue of $24.4 million assessed for transits through the Seaway locks between Montreal and Lake Erie and sundry revenues (rentals, wharfage, bridge revenue, etc.) of $3.4 million. Total expenses for 1971 amounted to $21.9 million of which operation and maintenance expenses amounted to $15.6 million, regional headquarters, headquarters administration and engineering expenses to $5.7 million and construction to $653,523 (Table 15.25).

15.4.4 Federal government marine services

Headquarters organization. The Marine Services of the Ministry of Transport has five branches – Operations, Marine Safety, Marine Pilotage, Marine Finance and Marine Personnel – each headed by a director responsible to the Deputy Administrator, Marine Services, Canadian Marine Transportation Administration. An additional unit, the Marine Emergency Office, also reports to the Deputy Administrator.

The Operations Branch has four divisions – Marine Aids, Canadian Coast Guard, Waterways Development and Telecommunications.

Marine Aids is responsible for planning, policy development and program administration related to a national system of marine aids to navigation and traffic control, and for research and development in these two areas. These responsibilities include the installation, operation and maintenance of electronic navigation systems such as Decca, Loran A and Loran C. They also include the development of port entry systems which involve radar surveillance, traffic control and conventional floating and shore-based aids to navigation. The Marine Aids Division develops standards and guidelines for the operation and maintenance of over 20,000 marine aids to navigation consisting of lightstations, buoys, fog signals and shore-based unattended lights. The Division carries out research and development related to new atomic and solar power sources as well as on conventional battery and hydro sources. The Marine Aids Division is responsible for administering the Navigable Waters Protection Act.