TCA survey flights began in July 1937 and a scheduled service between Vancouver and Seattle was taken over from Canadian Airways in September of that year. Thereafter, expansion was rapid. An airmail and express service between Lethbridge and Edmonton was started early in 1938; a similar service between Montreal, Ottawa, Toronto, Winnipeg and Vancouver was in operation by December of the same year and in April 1939 a full-scale mail and passenger service from Montreal to Vancouver was inaugurated; in November 1939 a mail service on an experimental basis was extended to Moncton and by February 1940 this, too, was open to passenger traffic; and in August 1940 a full-scale service between Toronto and Windsor by way of London was in operation. International services followed in quick succession—Toronto to New York in May 1941; and Gander to St. John's, Nfld., by way of Moncton, N.B., and Sydney, N.S., in May 1942. Thus, in a period of less than four years, Canada was possessed of a transcontinental day-and-night, all-weather mail and passenger service connecting all its principal cities.

In the meantime, World War II was effecting many changes in Canadian civil aviation. The British Commonwealth Air Training Plan, which was established in Canada in 1939 to train aircrews from every part of the Commonwealth, graduated more than 131,000 personnel before the end of hostilities. This entailed the building or expanding and equipping of some 270 airports and also the setting up of a vast training and administrative organization. A transatlantic ferry service was inaugurated in 1940, funnelling bombers from St. Hubert, and later Dorval, in Quebec through Gander and Goose, Newfoundland, to Britain. Before the end of hostilities, more than 35,000 aircraft had spanned the gap between the two continents and flying the Atlantic had become commonplace.

In January 1942, the Canadian Pacific Railway actively entered the aviation field by buying up ten of the largest private air carriers and incorporating them into one company under the name of Canadian Pacific Airlines (CPA). The new company, for the time being, continued to serve the outlying areas, as had been done by the private companies, and to provide a complementary feeder service to TCA.

In August 1942, TCA added to its duties by taking over the operation of the Canadian Government Trans-Atlantic Air Service on behalf of the Department of Transport. This Service was originally conceived as a wartime measure only, for the purpose of carrying mail to Canadian troops in Europe, although it later evolved into the TCA Trans-Atlantic Service.

By 1944, aviation was playing such a vital part in the Canadian economy that it was necessary to set up a new administrative body—the Air Transport Board—to rationalize its expansion with special regard to public convenience and necessity, rates and tariffs, and the financial aspects of airline operations. The Board of Transport Commissioners had previously performed a somewhat similar function but it was considered advisable to place the affairs of aviation in the hands of a body dedicated solely to that purpose. Questions relating to safety of operation were left in the hands of the Department of Transport. These procedures brought Canada's regulations into line with those in vogue in the most advanced countries in the world, for the country had assumed an almost embarrassingly prominent position in world aviation.

At the end of the War, Canada held the fourth world place in aviation, being superseded only by the United States, the U.S.S.R. and Britain. In recognition of this fact, Montreal was selected as the seat of the permanent Headquarters of the International Civil Aviation Organization (ICAO) established by the International Aviation Convention held in Chicago in December 1944: also, ICAO's sister organization, the International Air Transport Association (IATA) which represents all the major world airlines, set up headquarters in Montreal. The latter company was incorporated by a special Act of the Canadian Parliament on Dec. 18, 1945: the status of ICAO was, of course, established by treaty.