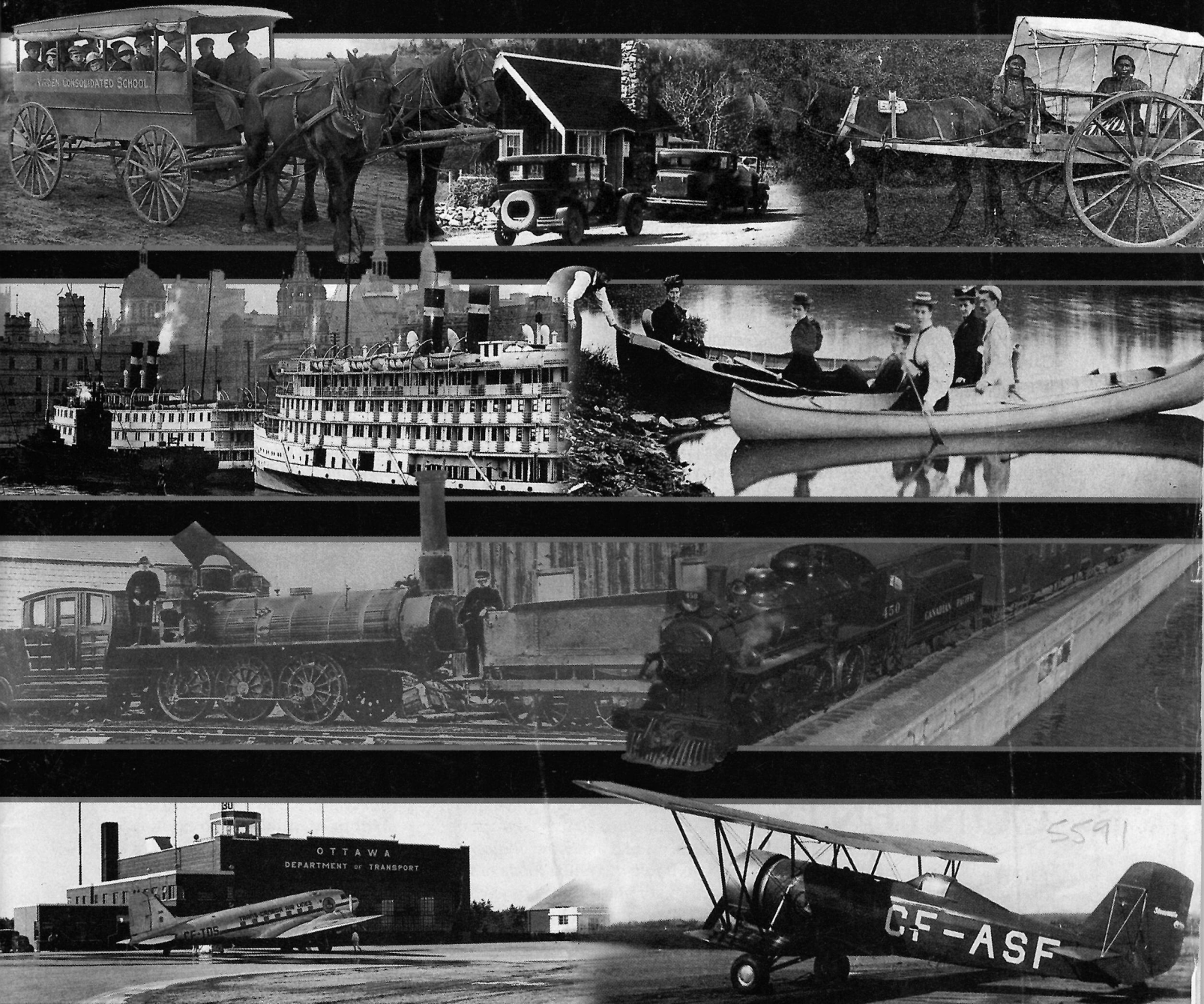


# Travel Through Time



## The Heritage of Transportation

Guide for Teachers, Youth Leaders, Heritage Groups



Transport  
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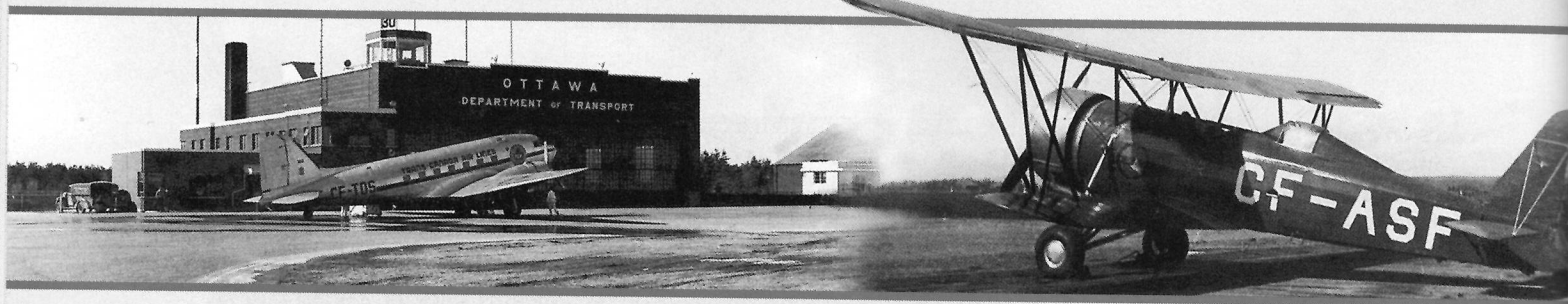
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# AIR

## Introduction

Canadians seem to have a special relationship with flight. The vast expanse of the country is best appreciated from the air, and many parts of the country are still virtually inaccessible by other means. Its early history is full of romance and daring. One of our great national myths is the plane that might have been: the ill-fated Avro Arrow. Our pilots have achieved near-legendary status as decorated aces, and the ingenuity of Canadian aeronautic engineers has an international reputation based on planes such as the de Havilland Beaver, the Canadair CL-215, and a whole range of commuter planes. Our relationship with flight has been described as a passionate affair, and it is one that

shows no sign of fading. In some ways, we have become almost blasé about a mode of transport that was considered miraculous, astonishing and dangerous within living memory.

## The Early Years

The first serious experiments with flight in Canada began at Baddeck, Nova Scotia, with the formation of the Aerial Experiment Association (AEA) in 1907. Its founder, Alexander Graham Bell, the inventor of the telephone, assembled a team of brilliant young engineers: Glenn Curtiss and Lt. Thomas Selfridge, both Americans, and Canadians John A.D. McCurdy and Frederick W.

"Casey" Baldwin. Assisted financially by the formidable Elsie Bell, the AEA carried out tests with box kites and models, to the delight of Bell's grandchildren summering at Beinn Bhreagh, the family's Cape Breton summer home. Their goal was to develop a stable, reliable self-propelled heavier-than-air craft that would carry a person.

Much of the work and the first test flights were carried out in New York at Curtiss' machine shop, including the first three planes designed by the AEA: the *Red Wing*, the *White Wing* and the *June Bug*. The *June Bug* remained aloft for 1,000m. In 1909 the *Silver Dart* was brought to Baddeck, where, on February 23<sup>rd</sup>, McCurdy made the first powered, heavier-than-air flight in Canada. The *Silver Dart*, McCurdy's own



*First Land Hangar, Vancouver, British Columbia, 1929. The first airports in Canada consisted of a landing field and one or more storage buildings for aircraft. Many airfields were built on farm lands. (Photo: Transport Canada)*

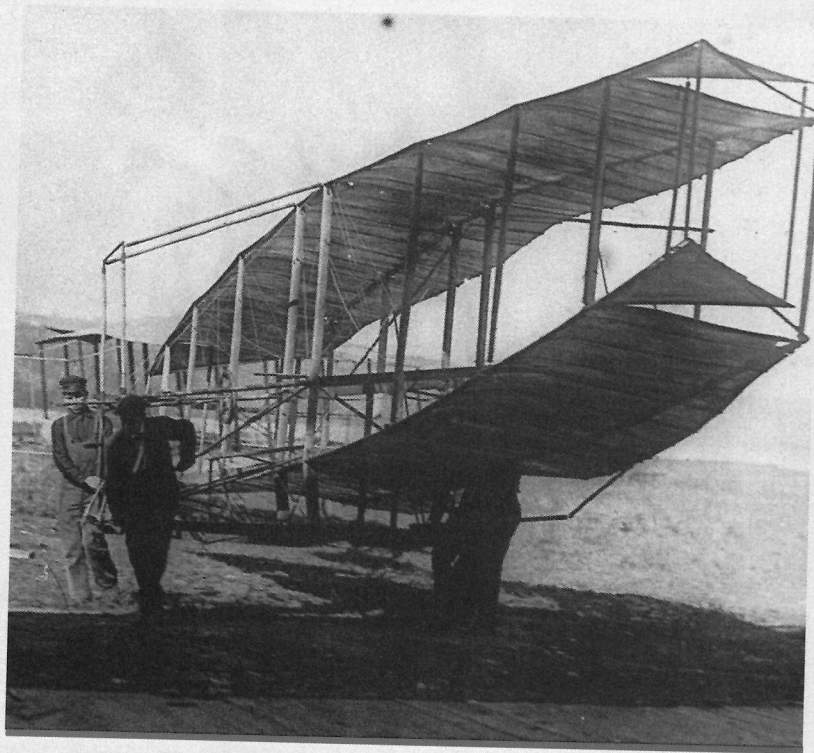


design, was regarded as "one of the most advanced airplanes of its day." It flew approximately 800m that day, but in subsequent tests it flew up to 32km. The team took the *Silver Dart* and another of its designs, the *Baddeck I*, to Petawawa for a demonstration for the military on August 2<sup>nd</sup>, 1909. After several successful flights, both planes crashed on landing. Neither the military nor the government in general could see any potential for the delicately built machines, and the AEA could get no financial support.

Pre-war flight in Canada continued to be mainly the pastime of individual engineers and enthusiasts who built their own aircraft. At the onset of war, there were few trained pilots and no manufacturing industry or air force. There was, however, no lack of heart nor of aptitude. The First World War gave Canadians a chance to develop their flying skills, while the country went into mass production of training planes.

Canadians signed up with the Royal Flying Corps, later the Royal Air Force (RAF), in droves despite appalling survival rates. By the end of the war there were 22,000 Canadian airmen including pilots and support crew personnel. One third of RAF pilots who had shot down 30 or more enemy planes, were Canadian. 1,563 Canadian pilots were killed, and four of the top seven aces in the RAF were Canadian. Among the Canadian flyers who distinguished themselves were: William Avery "Billy" Bishop (72 planes, Victoria Cross), Raymond Collishaw (60 planes), Donald Roderick MacLaren (54 planes), William Barker (53 planes, Victoria Cross), A. Roy Brown (11 planes, including the infamous Red Baron), and Alan Arnett McLeod (Victoria Cross).

At home, Canadian Aeroplanes of Toronto was manufacturing Curtiss JN-4's as trainers for the RAF, producing more than 8,000 during the course of the war. The experience provided the basis for



*The Silver Dart, Canada's first successful aeroplane, made its historic flight on February 23, 1909 at Baddeck, Nova Scotia. (Photo: Transport Canada)*

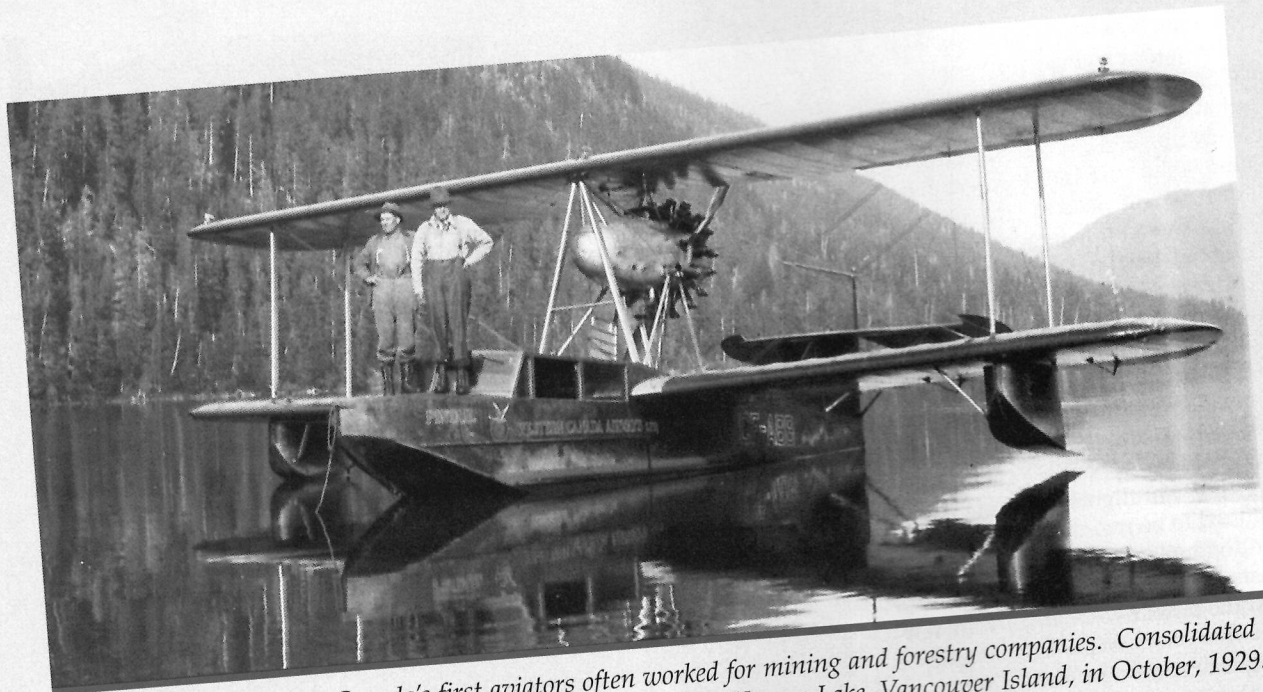
the aeronautics industry after the war. When it was all over, 2,000 skilled pilots returned from overseas looking for employment. At the same time, hundreds of aircraft were declared surplus and could be bought for practically nothing. The stage was set for the era of barnstorming.

## Developing Aviation Industry

Aviation was still in its infancy, and the dashing pilots in their fragile-looking planes were novel and exciting for a public so recently subdued by the bleakness of war. Based in barns and using fields for landing strips, these flamboyant young men astonished crowds who had never seen an airplane. The aerobatics they had learned in the heat of battle were transformed into aerial ballet in the big sky over small prairie towns.

It was romantic, but it was also chaos in the air. Without instruments or radio contact, pilots roamed freely, navigating by watercourses and roads, avoiding collisions by keeping their eyes peeled. Downed pilots sometimes sent distress messages by homing pigeon. There were no safety standards or licensing criteria. When the CPR sought approval to expand into air transportation, it also put pressure on the government to impose order before the situation grew more dangerous. The result was the *Air Board (Aeronautics) Act* of 1919. It gave the Board the authority to regulate commercial air routes, license airports, and oversee forestry protection and northern exploration.

The barnstormers carried on, supplementing their performances with teaching would-be pilots, carrying mail, and other improvised occupations. One of the strangest operations was a Chinese airfield where pilots were trained for Dr. SunYat Sen's army, located



Boeing B-1E flying boat. Canada's first aviators often worked for mining and forestry companies. Consolidated Mining and Smelting Company sent this prospecting party to Vernon Lake, Vancouver Island, in October, 1929. (Photo: Walker E. Gilbert, James Richardson and Sons. Ltd. Archives)

near Saskatoon. The heyday of the stunt pilot was drawing to a close as the public became accustomed to the roar of engines overhead. They began to gravitate towards a more practical—but no more conventional—occupation.

## Bush-Flying

The proliferation of small planes was a boon to northern resource development. Most of this vast area was unexplored, and inaccessible by roads or rail. Thousands of lakes and rivers offered natural landing strips, if planes were adapted with floats and skis. The challenge of flying in winter led to important developments in technology for extreme conditions, including landing gear for ice and snow. Fairchild Aerial Surveys of Canada first attempted winter flying in 1917–18.

Canada's first professional civilian pilot and the first bush pilot was Stuart Graham, who had served in the Royal Naval Air Service. In 1919 he commenced forestry patrols for the Laurentide

Paper Company in the Saint Maurice Valley using a Curtiss HS-21 flying boat developed for coastal patrol during the war.

Bush flying companies served resource industries carrying all kinds of freight; mail, passengers, carrying out surveys, etc. By the mid 1930s Canada was moving more freight by air than the rest of the world combined. Bush flying operations proved themselves useful in mining operations. Patricia Airways and Exploration Limited was instrumental in opening up Red Lake in Northern Ontario (1925), and Northern Aerial Mineral Exploration carried out the exploration of the Yukon and Ungava (1928).

Highly publicized long-distance flights made international heroes out of flyers like Charles Lindbergh and Amelia Earhart, but distances flown within Canada rivalled and sometimes surpassed these feats. For example, in 1929 a Western Canada Airways pilot set out from Winnipeg with stops in Great Bear Lake, Whitehorse, Prince George, and Edmonton before returning to Winnipeg for a total of 15,000km. By comparison,

Charles Lindbergh's solo trans-Atlantic flight was 5,800 km.

Remote communities have come to depend on bush planes for medical emergencies. They have been used for this purpose as early as 1920. In a dramatic early case, in 1928 an outbreak of diphtheria struck the village of Little Red River in northern Alberta. A call for help was sent out by dogsled to the nearest telegraph station at Peace River, where it was relayed to the Board of Health. Commercial Airways of Alberta dispatched a plane with vital medication less than 24 hours after the dog team had set out. Nightfall forced the pilot, "Wop" May, to land at Peace River and the serum was taken the rest of the way by dogsled, averting disaster. The response is all the more remarkable, considering that May and his co-pilot, Vick Horner, were flying in an open cockpit in the middle of winter.

For most populated places the mail was carried by train, and sorted en route. It was not especially fast, but acceptable. Captain Brian Peck flew the first official Canadian air mail from Montreal





*The first airport in Hamilton, Ontario is an example of the flying schools established during the 1920s with the encouragement of the federal government. For \$1.00/minute in the air, students earned their pilots licenses. (NA C-061597)*

to Toronto on June 24th, 1918, but it was not considered to be a vital improvement over surface mail at the time. In remote areas, however, mail could take weeks to get in or out. During the late 1920s and '30s, air mail transformed these communities, reducing the impact of isolation.

On March 1<sup>st</sup>, 1939, a daily air-mail service between Montreal and Vancouver began. It was extended to the Maritimes in January 1940. By 1948, all first class mail was being carried by air in Canada with no additional charge.

## Passenger Air Travel

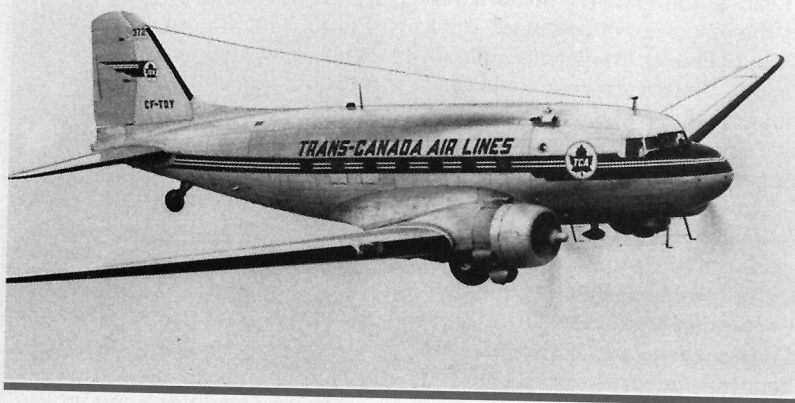
Bush flying companies grew into larger operations, leading to modern airlines; Western Canadian Airways (1926) became Canadian Airways (1930), Canadian Pacific Air Lines (1942) and then Canadian Airlines International Limited (1988). It merged with Air Canada in 1999.

In the beginning, passenger service was an offshoot of freight and mail delivery by bush pilots, and consisted primarily of carrying people beyond the limits of rail and road connections. Passengers

were part of the payload in the cramped and noisy cabin. As flying became safer and more available, it was perceived as a practical alternative to slower modes of transportation. As the numbers of air travellers increased, more attention was focussed on their comfort. Modern airliners began with the Boeing 247D, introduced in 1933, which featured sound-proofing, air conditioning, reading lamps, and flight attendants.

The government recognized the need to establish a transcontinental service in 1937, when it became clear that American airlines were ready and willing to start siphoning off the Canadian market into its own network. Trans-Canada Airlines, later Air Canada (1964) was created to ensure that Canada had a Canadian carrier. Its first planes were two Electras and a Stearman Model 4. In 1945, the airline acquired its first Douglas DC-3, built in the United States, the workhorse of civil aviation for 40 years.

Gradually travel by air has become commonplace, and the amenities offered to travellers have multiplied. Airlines now market their service highlighting luxury, roomy seats, on-board films, music, telephones and a range of "Executive" Class services. Passengers no longer need to sacrifice comfort



*Douglas DC-3. Also known as the "Dakota", this workhorse of aviation was developed in the 1930s and used by Trans-Canada Airlines from 1945 until 1963. (Photo: Transport Canada)*



*Toronto Island Airport. Built in 1938–39, this is one of Canada's earliest airport facilities still in use. It is a National Historic Site. (Photo: Toronto Harbour Commission Archives)*

for speed and convenience.

Aviation has dominated international travel in the second half of the 20<sup>th</sup> century. The opportunity for world travel by greater numbers from the 1950s onwards has been a factor in the accelerating trend towards "globalization" that now preoccupies the economy.

## The Birth Of The Aerodrome

Between the wars the government began to take an active role in the development of infrastructure to support the aviation industry and build a ready supply of trained pilots in case of another conflict. Early airfields were rudimentary, with modified barns for hangars and little else. In order to promote the training of pilots, a scheme was initiated by the federal government to assist local flying clubs in building proper hangars, landing strips and creating training programs. The "aerodrome," a particularly 20<sup>th</sup> century place, was born. The clubs established

under this program often helped support facility improvements by doubling as municipal airports. The experience gained in this way provided the basis for setting up the British Commonwealth Air Training Program during the Second World War.

The government built few airports during the 1920s. Exceptions at Rimouski and St-Hubert were built to handle airmail. During this decade, passenger traffic increased tenfold. The Controller for Civil Aviation, John Wilson, pointed out to the Liberal government of Prime Minister Mackenzie King that the Americans were looking hungrily at the potentially lucrative—and so far untapped—Canadian market.

In 1928, King made a commitment to build a network of airports across the country, but before the government could act, the Depression began. The Conservative Party under R.B. Bennett came to power in 1930 and cancelled the project. Nevertheless, the systematic construction of airports began around 1932, and by 1936, 50 had been built at 160 km

intervals, with emergency landing strips halfway between. Trans-Canada Airlines was created in 1937, and the first coast-to-coast passenger service was inaugurated March 6<sup>th</sup>, 1938, utilizing the string of airports.

Advancing technology and facilities for the comfort of passengers had changed the character of the fully-equipped airport. Each had three runways, boundary lighting, a radio beacon and teletype machine. In addition, they had terminal facilities for administration, handling luggage, issuing tickets, and a waiting area. Other advancements through the 1930s included air traffic control, flight plans, fixed routes, designated levels and radio contact. By 1927 some airports were also equipped with runway lights.

## Wartime

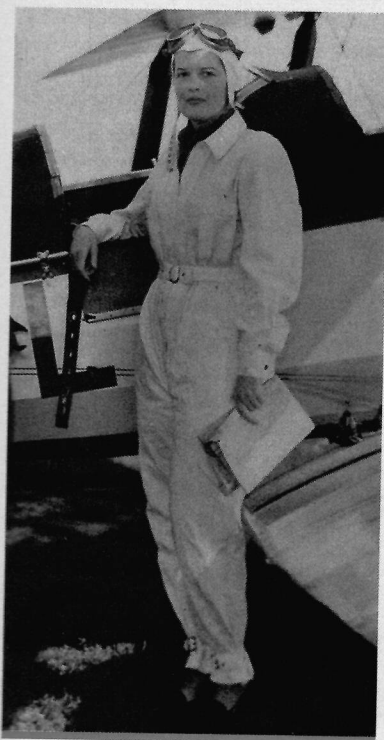
When hostilities again broke out in 1939, Canada was far better prepared in terms of its air-readiness. Planes were manufactured in



great numbers, including Ansons, Mosquitos and Tiger Moths (de Havilland), the Canso amphibian (Canadair), the Lancaster (AVRO) and the Hurricane (Hawker).

The Lancaster was the most successful heavy night bomber of the war, carrying the biggest payload. The view upwards from the tarmac into the open bomb bay doors is still an awe-inspiring sight. Victory Aircraft Works (later acquired by AVRO) at Malton, near Toronto, built 400 Lancasters. They were able to withstand heavy damage, and could still be flown with holes in the fuselage and pieces missing from the wings and tail. Victory also produced the Hampden medium bomber, the plane flown by the Royal Canadian Airforce (R.C.A.F). early in the war.

The Hurricane (Hawker) has a less romantic reputation than the Spitfire, but it was a more signifi-



*Jessica Jarvis of Toronto, Ontario, was the first woman in Canada to earn her commercial pilot's licence. Photo dates to about 1932. (Photo: Transport Canada)*



*Gander Airport, Newfoundland. Ever since the first trans-Atlantic flight in 1919, Newfoundland has been an important transportation node for Canada and the world. Gander Airport has served international aviation since 1938. (Photo: Toronto Port Authority)*

cant player in actual service. It proved to be the critical plane of the Battle of Britain. Canadian Car and Foundry in Port Arthur, now Thunder Bay, Ontario, built 1,400 Hurricanes.

The casualty rate for fighters and bombers was phenomenal, and the supply of new planes regularly ferried across the Atlantic from Canada was vitally important. But it was not for airplane production alone that Canada earned for itself the title "Aerodrome of Democracy," coined by American president Franklin Roosevelt. Building on the experience of flying club training programs developed between the wars, Canada launched the British Commonwealth Air Training Program (BCATP) in response to the Allied demand for airmen. The BCATP was a major Canadian contribution to Allied air superiority during the war. Almost half of the aircrews serving Britain and the Commonwealth during the war were trained at the 107 BCATP schools spread across Canada, a total of 131,553 personnel from Canada, Britain, Australia and New Zealand.

## Women In Aviation

Women pilots were rare in the early years of aviation. In 1918, Katherine Stinson flew an air-mail run from Calgary to Edmonton. Madge Graham, wife of bush pilot Stuart Graham, was a good navigator and flew with her husband, a very daring thing to do and a novelty in 1919. It was ten years before a woman obtained a pilot's licence. Eileen Vollick was the first Canadian woman to do so. Within four years more than 20 other women had qualified, but they were confined to recreational flying. No one would employ a woman as a professional pilot. When the war broke out in 1939, female pilots were turned away from recruitment centres—the RCAF was not yet ready for women fighter pilots.

During the war, women were expected to take on non-traditional jobs to free up men for fighting. This included building munitions and aircraft. Their skills were highly regarded—the Lancaster was held up as a standard for fine craftsmanship. The first woman aeronautical engineer in the world was Canadian Elsie MacGill, who



*The de Havilland Canada DHC Twin Otter was introduced in 1966 as a short take-off and landing (STOL) aircraft. It has filled a wide variety of roles—both civil and military—on wheels, skis and floats. (Photo: de Havilland Aircraft of Canada Limited)*

was the chief engineer at Canadian Car and Foundry in charge of Hurricane production.

Women who were qualified pilots taught navigation to RCAF trainees. The very best of them were taken in the Air Transport Auxiliary (ATA), which ferried aircraft around Britain and Europe, to and from factories, squadrons and bases. Five Canadian women, including Marion Orr, Violet Milstead and Helen Harrison served in the ATA.

After the war the women who had risen to the occasion and worked in traditionally male jobs to support the war effort were expected to step aside and let the returning veterans have their jobs back. Many did so with relief and gratitude to have their loved ones home safely. For others it was more difficult. Marion Orr and Violet Milstead persisted and taught flying. Orr established her own school after some initial resistance, and Milstead worked for Nickel Belt Airways, where her husband was the chief flying instructor. Women as pilots were still unusual, and most were involved in aviation as stewardesses. Contrary to the stereotype in

popular culture, however, these women were required to be registered nurses as well as charming attendants.

In the latter part of the 20<sup>th</sup> century women have made great strides in aviation, taking their place alongside men in commercial aviation (Judy Cameron, 1978), combat roles (Major Deanna Brasseur, 1980), and even in outer space (Roberta Bondar, 1992/Julie Payette, 1999).

## Post-war Technology

By the end of the war there were 587 airports, airfields and air harbours in Canada, many of them former BCATP facilities. There was also a substantial aviation industry with great potential for civil aviation, in particular at Malton outside Toronto, Cartierville, Winnipeg and Vancouver.

Canadair, formerly a branch of Canadian Vickers in Montreal, moved to Cartierville during the war where it built Canso amphibians. Canadair was later licensed to build the Sabre F-86, an American jet and the most success-

ful fighter used in the Korean War. It built them with a more powerful Canadian engine, and RCAF pilots in Canadian built Sabres ranked among the best in the world. RCAF later replaced the Sabre with Canadian-built Lockheed CF-104 Starfighters. Canadair now produces executive and commuter jets.

De Havilland in Toronto was a division of the British de Havilland Aircraft Company, distributing and servicing planes produced by the parent firm until the war. It then went into the production of Anson, Mosquito and Tiger Moth planes. After the war, de Havilland produced the phenomenally popular Beaver (1947), the first in a series of short take-off and landing (STOL) turboprop aircraft designed for bush and later commuter flying. De Havilland got it right by asking bush pilots what they needed.

The Beaver featured the first all metal structure in a bush plane equipped with versatile cargo doors. Its wing design gave excellent STOL performance. The Beaver has been recognized as the best small utility plane in the world. It beat out all American





*Martin Mars Flying Boats. Built by the Martin Aviation during the Second World War for use as troop transports in the Pacific, several of these aircraft were purchased by Flying Tankers Ltd. to serve as "water bombers". They are the largest amphibious aircraft in the world: 121 feet long with a 200-foot wingspan. They are powered by four 2,500-horsepower Wright Cyclone engines, each with 12-cylinders, requiring 96 sparkplugs altogether. (R.J.S. Photo)*

competition for supplying the U.S. military in 1950–51. They bought 900 and used them in the Korean and Vietnam wars as airborne jeeps. They have also been exported to 62 countries worldwide. A total of 1,691 were manufactured, more than any other Canadian-designed plane to date, and many are still in use. Later planes in the series include the familiar Otter, Buffalo, Twin Otter, Dash 7 and Dash 8 models.

Another development from bush flying was the use of planes not only to spot fires but to actually fight them. Experiments with tanks were not very productive, until roll tanks were developed during the 1950s. Mounted on the floats of Beavers and Otters, they could be filled quickly by taxiing across the water for a few minutes. A significant improvement was the Canadair CL-215 (1967), designed to collect 5,400 litres of water in 10 seconds while skimming over the surface of lakes and rivers. The entire load can be dropped in a split second, delivering its payload with forceful effect. The efficiency of these water-bombers is such that a CL-215 holds the world record for drops

in a single day—225! CL-215s are used across Canada and have been exported to Europe, Asia and South America. Although aging, the two Martin Mars water-bombers based in Port Alberni, British Columbia, are the largest flying tankers in the world.

The combined production of Canadair and de Havilland has made Bombardier (which owns both companies) the third largest manufacturer of civil aircraft in the world.

Toronto emerged as a centre for aero-engine design, such as the Chinook turbojet designed by Turbo Research Limited beginning in 1944. This team combined with A.V. Roe (Canada) Limited (AVRO), which had acquired Victory Aircraft, manufacturers of the legendary Lancaster bombers. This group designed and manufactured nearly 4,000 of the highly successful Orenda turbojet engine according to the requirements of the RCAF.

Other breakthroughs developed by AVRO include the C-102 Jetliner, the first passenger jet liner built in North America. It was flown only two weeks after the world's first, the British de

Havilland Comet. It was a breakthrough in technology, exceeding all standards for passenger liners. When it was tested August 10<sup>th</sup>, 1949, it hit speeds of up to 800 km/h, nearly twice the average speed for commercial aircraft. The C-102 attracted a lot of attention in the United States, but Trans-Canada Airlines was not interested. The Jetliner never went into production, and the prototype was cut up for scrap in 1956.

AVRO had better luck with the CF-100 Canuck (1950), considered the best all-weather fighter of its day, and particularly well-suited to extreme climate conditions in the Far North. The company built nearly 700 CF-100s, some of which were in use by the RCAF for 30 years.

The contentious history of the AVRO Arrow has been woven into the fabric of Canadian mythology to a remarkable degree. Most Canadians know the basic details: the design team at AVRO conceived a new and brilliant solution to super-sonic flight, that it performed well in test flights, and that the Conservative government of John Diefenbaker not only cancelled the program on February



*Winnipeg Airport, Manitoba. Canada's airports are now seen as vital links in the chain of our national transportation system. They are constantly being improved for the benefit of public convenience and security, as well as the needs of freight services. (Photo: Transport Canada)*

20, 1959, before the jet went into production, but apparently also destroyed all of the prototypes and every scrap of paper related to its design. Some 14,000 workers in the aviation industry lost their jobs, and Canada never again aspired to develop its own aerospace weapons system. Whether or not this fiasco actually harmed the Canadian aerospace industry remains a subject of heated debate to this day.

Pratt and Whitney in Montreal is another major figure in the Canadian industry. It was established in 1929, and expanded during the war, producing engines for the military. Pratt and Whitney engines power commuter planes built around the world, including the Canadian-built Dash 8.

## Impact On The Landscape

Relative to other modes of transportation, the physical impact of air travel on the landscape has been minor, but significant nonetheless. Airstrips in remote

communities contribute to the character of these places as well as providing essential services. In some cases air travel has actually spurred settlement.

Airports around major cities have another kind of character, created by the interlacing of other modes of transit to deliver passengers to the terminals. International airports in particular require collectors from a large area, and are characterized by express feeder highways and large parking lots. The expanse of airfields has increased with the technical requirements of larger, faster planes, and with the noise buffer required as residential encroachment occurs.

The use of aerial photography by the Department of Energy, Mines and Resources and by commercial resource companies for surveying and mapping previously uncharted parts of the country has revealed that landscape to Canadians. The effect has been that the northern landscape has become part of Canadian cultural awareness and identity, even for those who have never ventured north. For others it has inspired

them to visit the North, stimulating a new type of travel: eco-tourism.

Buildings associated with air travel are generally airport facilities, either terminals or hangars. A study of hangars as a building type has been carried out by the Federal Heritage Buildings Review Office due to the large numbers of these structures built during two world wars, more than 700 during the Second World War alone.

The operational requirements for hangars called for wide span trusses to support a high roof without intervening posts, and large doors to permit easy access for aircraft. Several types were developed, and some early ones survive at CFB Borden, the only hangars of the First World War to survive in the world. Others fell into disuse and gradually disappeared, although until the 1980s a decrepit First World War hangar could still be seen amidst the peach orchards near Beamsville, Ontario, in the Niagara Peninsula, used to store baskets and farming equipment.

When the BCATP was established, a standard double hangar was designed with a roof system called the Warren Truss. These were built in their hundreds across the country, and many are still in use as drill halls, flying clubs, aviation museums and municipal airport hangars.

Airports developed gradually as passenger volume, technology and public expectations grew. Very few old airports survive to show what they used to be like, mainly because of the need to renovate and upgrade on a constant basis. The Toronto Island Airport built in 1938-39 is a good example that had endured because it could not expand!

In the late 1950s and early 1960s, passengers were taken outside the terminal to board the plane using movable staircases that were rolled out to the plane. As traffic increased airplanes were parked in bays alongside the ter-



minal, and access ramps directly from the building were developed. The size of the bays was dramatically increased by the introduction of larger and larger planes, resulting in long concourses of arrival and departures gates.

The air traffic control tower grew out of the increasing need for flight co-ordination as traffic increased. Developments in radio

contact with airplanes, radar tracking and instrument flying as well as the use of multiple runways have all contributed to the design of these buildings. A wide field of vision elevated well above surrounding buildings was once essential. With improvements in tracking technology very little is done by looking out the window nowadays!

The transformation of airport design continues, keeping pace with issues such as baggage handling, security, customs and immigration, and information and air traffic control technology. In the most up-to-date airports, passengers in the waiting areas will have wireless Internet access through servers installed in the structure of the terminal.

## Related Web Sites

### National Aviation Museum:

<http://www.aviation.nmstc.ca/Eng/english/home.html>

### Western Canada Aviation Museum:

[http://collections.ic.gc.ca/bush\\_flying/](http://collections.ic.gc.ca/bush_flying/)

### Canadian Museum of Flight:

<http://www.canadianflight.org/index01.htm>

### Canada's Aviation Hall of Fame:

<http://www.collections.ic.gc.ca/aviation/cahf.htm>

### Educator's Toolkit, Air Travel:

<http://www.eagle.ca/~matink/themes/Transport/air.html>

### Highlights in the History of Canadian Aviation:

<http://collection.ic.gc.ca/highlights/>

### Canadian Women in Aviation:

[http://collections.ic.gc.ca/high\\_flyers/](http://collections.ic.gc.ca/high_flyers/)

### The Stewart Graham Papers, Origins of Bush Flying in Canada:

<http://collections.ic.gc.ca/sgraham/>

### Canada's Innovation Aviation Heritage:

<http://www.collections.ic.gc.ca/canadair/>

### Canada Science and Technology Museum:

<http://216.94.16.48/>

### Canadian Space Agency:

<http://www.space.gc.ca/>

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## Suggested Exercises

- 1 During the Second World War, BCATP bases were established across the country to train pilots for the air forces of Commonwealth countries. Which one was closest to your community? Find out how many pilots were trained there and where they were from. What kind of planes did they use? What is the base used for now?
- 2 Alexander Graham Bell experimented with kites for many years while developing his concepts for heavier-than-air flight. Find out what he discovered, and design your own kite.
- 3 Many northern and remote communities still depend on bush planes for everything that needs to be brought in, from medicine to engine parts. Use the Internet to make contact with one of these towns, and with an air freight company to find out how it is done today.