



A HISTORY OF PUBLIC TRANSIT INFRASTRUCTURE IN THREE CANADIAN CITIES

One of the first modes of public transit¹ in Canadian cities was the “omnibus,” a horse-drawn coach with seats for several people, usually running lengthwise. Omnibuses started running in the late 1840s and were short-lived. In the 1860s, street rail began in the form of horse-drawn streetcars or “animal railways.” Electric streetcars replaced horse-drawn streetcars in Montreal, Toronto, and Vancouver during the 1890s.

From the late 1800s to the early 1900s and before the automobile was affordable for most Canadians, public transit boomed. Streetcars were an inexpensive and convenient mode of public transit in cities. Ridership increased so fast in Montreal -- Canada’s biggest city at that time -- that the city experienced streetcar gridlock. Other modes of transportation, such as the bus and subway, became popular after the advent of the automobile.

The history of public transit infrastructure in Canada’s major cities includes a flurry of construction during the late 1800s when street rail companies built streetcar lines. A second wave of construction occurred during the building of the modern subway systems in the 1950s and 1960s. During this period, cities converted part or all of their streetcar systems to trolley bus² and diesel bus systems. In the 1960s and 1970s and in response to extensive urban sprawl, Canadian cities began operating commuter rail systems³ such as Toronto’s GO Transit, which began in 1967. In the 1980s, Canada’s major cities built new and innovative light rail transit systems⁴ such as Vancouver’s SkyTrain. Today, as the car continues to out-compete public transit, cities such as Toronto struggle to fund the expensive infrastructure required for subway and other public transit systems.

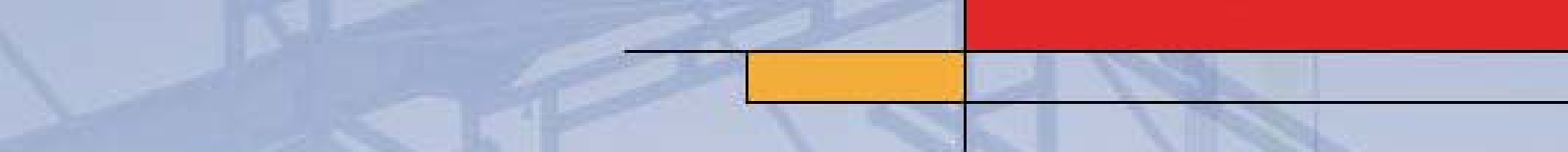
Montreal

The City Omnibus Company began running omnibuses from Bonaventure station to Longueuil ferry (Angus and Wilson) in 1848, but omnibuses were soon relegated to a back seat. The Montreal City Passenger Railway Company, established in 1861, competed with and soon surpassed omnibus service in Montreal. Eventually, omnibus use was reduced to the seasonal transition between horse-drawn streetcars, or “tramways” to Montrealers, and sleighs or winter “tramways.”⁵

Beginning in 1892, electric streetcars began to replace horse-drawn streetcar service, which terminated in 1894. The introduction of the electric streetcar occurred before the private automobile became popular and coincided with a golden age in the history of Montreal – a period of rapid urban expansion, economic growth, and a population boom -- creating a heyday for public transit.

In the early 1900s, when Montreal was Canada’s largest city and the commercial, financial, and cultural center of the country, street rail became so popular that the city experienced streetcar gridlock during peak hours. The number of tracks changed little while the number of streetcars increased drastically. A 1910 photo of rush hour shows bumper-to-bumper streetcars in downtown Montreal.⁶ Before the Second World War, the number of “tramways” in Montreal had grown so fast that in 1913 there were 485 tramways on the four main downtown north-south arteries from five to seven in the evening.

Buses, originally known as “trackless tramway,” began running in 1919. Originally, the city had only two buses, but in 1925 the Montreal Tramway Company created a Bus Division. The following year the number of buses in operation increased from 28 to 57. On March 29, 1937,



Montreal introduced the first modern trolley bus service in Canada, on Beaubien Street. In 1959 when streetcars had become passé, Montreal followed the trend among cities to modernize by abandoning its street railway. To accommodate a quickly growing city many of the old tracks were simply buried under new pavement.

The world's first subway system opened in 1863 in London, England. Paris opened its metro (subway) in 1900, and New York City followed with its subway system four years later. Canadian cities lagged far behind. From the turn of the century entrepreneurs proposed a Montreal subway system or "underground tramway," but it was not until October 14, 1966 that Montreal finally opened its metro. The Montreal metro was the first subway in the world to run entirely on rubber tires as opposed to steel wheels on rail. Rubber-tired systems are quieter, accelerate faster, and are able to climb or descend steeper slopes than conventional rail subways; however, the wheels create more friction and therefore consume more energy. Line 1 and Line 2 first opened with 20 stations in operation, and six months later Line 4 opened. A Line 3 was once proposed but never built. The total cost for the three lines was \$213.7 million.

Today the Montreal metro has an average daily ridership of more than 750,000. It accounts for close to half of all trips to the downtown area and includes 66 kilometres of tunnels, 65 existing stations, and three stations under construction. One of the distinct features of the metro is its art work: the metro contains over one hundred works of public art, such as sculpture, stained glass, and murals by noted Quebecois artists. While not every station contains works of art, it is considered to be among the most beautiful subway systems in the world.

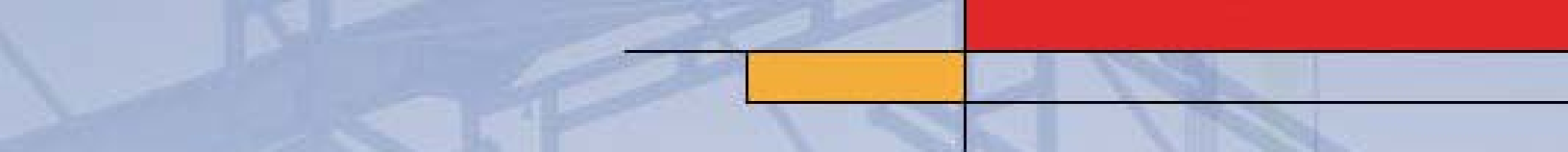
Vancouver

Vancouver Street Railways began laying track down Granville Street in 1889, and the first electric streetcars began running in 1890 – streetcars were small, with four wheels, bench seats, and open platforms. In the first decade of the 20th century, streetcar lines expanded in New Westminster, Vancouver, and the neighbouring municipalities of Point Grey and South Vancouver, and operation began in North Vancouver.

Vancouver began to convert its streetcar lines to buses before the Second World War. In 1945, the British Columbia Railway Company Limited (BCER), which was founded in 1897, began a ten year program to convert all streetcars to rubber-tired buses or "trolleys." By 1955, Vancouver had converted all streetcar routes to buses or trolleys. Electric trolleybuses are still in use today.

In the late 1970's buses serving Vancouver's long-distance public transit lines could not alleviate the growing automobile congestion caused by suburban commuters. The city's answer was the SkyTrain, which was originally built for Expo 86. The city decided to build a low-cost, high tech rapid transit line as opposed to a traditional subway or light rail system. This first section of the SkyTrain opened just in time for Expo, and was later designated the Expo Line. Work then began on an extension across the Fraser River, which required the construction of the cable-stayed SkyBridge, the longest transit-only bridge in the world. The extension opened in 1994. A second line of the SkyTrain, the Millennium Line, serves northern Burnaby and eastern Vancouver. It opened to the public on August 31, 2002.

The Expo and Millennium Lines run along 49 kilometres and comprise the world's longest automated light rapid transit system. The SkyTrain is emissions free and energy efficient, since it runs on electricity. It travels on elevated and segregated right-of-way guideways high above traffic with no pedestrian or vehicle crossings.



The Greater Vancouver Transportation Authority, TransLink, is planning two new rapid transit lines to extend the SkyTrain's existing lines: a line to Coquitlam and a line to link central Richmond, the Vancouver International Airport, and Vancouver. Construction of the Richmond – Airport – Vancouver (RAV) line is scheduled to begin in August 2005.

In 1995, the West Coast Express commuter rail service began and now operates five lines using bi-level trains, which are more modern versions of the equipment used by GO Transit train lines. The trains run during peak periods between the northeast suburbs and downtown Vancouver.

Toronto

Toronto's Yonge Street is known as the world's longest street, and over the past two centuries this Canadian legacy has witnessed the evolution of public transit. Many mark the beginning of public transit in Toronto with the Williams Omnibus Bus Line. Owner Burt Williams carried passengers in omnibuses along Yonge Street between the St. Lawrence Market and the Village of Yorkville in 1849. More accessible were horse-drawn streetcars, with doors opening at street level. Instead of wheels, horse-drawn streetcars were rail-based on steel tracks. The city granted the first franchise for a street railway to the Toronto Street Railway Company in 1861.

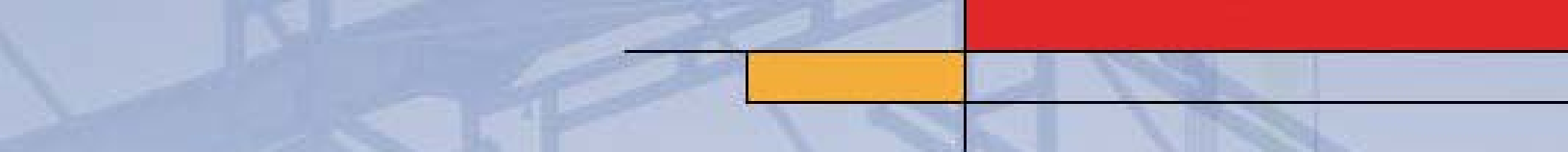
The company laid tracks along Yonge and King Streets using the same non-standard Toronto Transit Commission (TTC) track gauge used today -- 4 feet 10 7/8 inches (standard railway gauge is 4 feet, 8 1/2 inches). Historians have debated the reason for Toronto's odd width. It seems that the Toronto Street Railway Company chose the width to accommodate private wagons before Toronto's dirt roads were paved. The Toronto Street Railway ordered that the gauge should make the tracks available to ordinary vehicles and that it be lawful for anyone to use the tracks while reserving the right of way to the Toronto Street Railway. Horse cars with iron wheels ran on the upper step of the rail, and wagon wheels made of wood with an iron tire could run on the lower step of the rail. The TTC is the only railway in the world to use this gauge, which it still uses for all streetcar and subway rail.

Toronto's first electric streetcar began service in 1892, and by 1894 the last horse-drawn streetcar was retired. By the 1910's, several streetcar systems existed in Toronto with different fares. In 1911, the City of Toronto constructed a number of street railway lines to expand service in the far reaches of Toronto -- Gerrard and Danforth lines in the east, a St. Clair Avenue line in the north, and a Bloor Street line past High Park in the west. The privately owned Toronto Street Railway Company refused to build these lines, which were built under the name, Toronto Civic Railways.

A Provincial Act in 1920 created the forerunner to the modern Toronto Transit Commission (TTC), then called the Toronto Transportation Commission. Finally, the city's many streetcar systems were amalgamated into one, and by 1927 the TTC ran all streetcars in Toronto.

Toronto's first buses were introduced in 1921, and the first electric trolley buses ran in 1922. Trolley buses did not require steel tracks and were more flexible to operate because they were constrained only by overhead wires. Although they did not use rails, trolleys used the electric feeder system in place for streetcars. They were cheaper to build than streetcars and had lower infrastructure costs. Many cities converted their streetcar systems in whole or in part to trolley buses, including Montreal, Saskatoon, Halifax, and Vancouver.

Toronto's trolley bus fleet and its infrastructure were reaching the end of their useful lives by 1992, which coincided with low oil prices, a budget crunch, and shrinking ridership. It would



have cost the TTC millions to upgrade aging infrastructure, and natural gas buses manufacturers marketed them as an attractive alternative to the trolley bus. Toronto eliminated its trolley bus service in the 1990s even though the improvements promised by natural gas buses were only in comparison to diesel buses, not trolley buses.

From the 1930s until the 1960s when it was fashionable to do so, Toronto did not abandon its streetcar lines. Although for decades Toronto did intend to abandon its streetcar lines, today the city is considering the creation of streetcar and bus lines in dedicated rights of way as alternatives to subway expansion. In contrast to the billions of dollars required for subway expansions, experts predict that these alternatives will cost in the hundreds of millions of dollars.


Construction of the first subway system in Canada did not begin until 1949. Engineers used a technique known as “cut-and-cover” to build the underground infrastructure for the first Yonge Street portion of the subway system. This method involves temporarily relocating surrounding utilities, removing the road surface and placing “Street beams” across the excavation site. This allows a temporary road surface to be built on the street beams so that the tunnelling can progress below while permitting traffic to flow above. When the concrete “subway box” is complete, the hole is filled with compacted earth, the street surface is restored, and utilities are replaced. Finally, the subway tracks are laid and the inside of the subway box is completed. At an approximate cost of \$50.5 million in 1954 dollars, the Yonge Street subway was much less expensive to build using this method, but the construction disrupted automobiles, businesses, and the city’s main streetcar network. The London subway, which was constructed by sinking shafts and driving tunnels underground, caused much less disruption to the above streets. However, this type of tunnel method requires a much deeper subway system, which raises costs considerably and causes additional delay. The cut-and-cover method is still used today, most recently to construct the new Sheppard Line that opened in 2002.

In 1963, the University subway line opened between Union Station and St George Station, and in 1966 the Bloor-Danforth subway line opened between Keele Station and Woodbine Station. In the 1970s and 80s the Yonge Subway was extended north and the Bloor-Danforth Subway was extended west and east. In 1978, the Spadina Subway opened between St George Station and Wilson Station. A few derelict subway stations remain in Toronto’s bowels such as the never completed Lower Queen station and the abandoned Lower Bay station under Bay/Bloor. Lower Bay is often used for shooting movies and commercials.

Toronto’s subway system also uses the unique gauge first used for streetcars by the Toronto Street Railway Company. Originally, the TTC used the gauge so that streetcars could be routed into the subway right-of-way, or be converted into subway cars. Some streetcars were converted for use as subway work trains, and the common gauge allows mixing of parts between the streetcar and subway networks.

An important aspect of public transit infrastructure is the space used to store and work on vehicles. Streetcars, buses, and subways require garages and yards. In Toronto there remain networks of old carhouses and streetcar lines such as the Landsdowne Carhouse, which the Toronto Railway Company (TRC) began working on around 1910. Today the TTC houses its vehicles in seven garages.

As Toronto expanded and sprawled, more transit was required to bring commuters into the city core; therefore, in 1967 the Ontario Government initiated a new commuter service, GO Transit, on Canadian National rail tracks between Hamilton and Pickering. Today, the GO Transit rail and bus system carries over 44 million passengers per year and spans a service



area that includes Hamilton and Guelph in the west, Barrie in the north and Newcastle to the east. In 2004, Infrastructure Canada, through its Canada Strategic Infrastructure Fund (CSIF), and the Ontario government contributed to 12 construction projects aimed at improving the GO Transit rail and bus system.⁷

Public transit funding and ridership face steep competition in today's Toronto. All three levels of government are working together to ensure the viability of Toronto's public transit system. In March of 2004, the Governments of Canada, Ontario and the City of Toronto announced a \$1 billion funding package to improve, modernize and expand the TTC system and help provide better transit service to the TTC's 1.3 million daily riders. The agreement will average \$70 million per year from each government over five years and represents the largest ever joint federal-provincial investment in municipal transit.⁸

Conclusion

From omnibuses to the Vancouver SkyTrain, Canada's public transit has evolved continuously for over 150 years, accommodating change and transforming our cities. Historically, Canadians used public transit because it was an affordable and efficient way to travel. Today, public transit is essential for new reasons, and it is more important to Canadian cities than ever before. Public transit is a vital part of Canada's climate change strategy for reducing greenhouse gases and meeting its Kyoto commitments. According to the Canadian Urban Transit Association (CUTA), transportation is the largest source of greenhouse gas emissions. Public transit also reduces air pollutants that contribute to smog and respiratory illness, helps to reduce urban sprawl and conserves green space. It not only reduces the number of vehicles in the downtown core, it increases the number of pedestrians, as transit passengers are also pedestrians. This increase supports retail businesses, creates vibrant streets, and discourages crime. In addition to its environmental, social and economic benefits, public transit is also a much safer mode of travel.

To realize the numerous benefits of public transit, our public transit systems need expanded capacity, new technology, increased ridership, and continued investments to modernize and renew existing infrastructure. The federal government, through programs like INFC's Canada Strategic Infrastructure Fund, is investing in public transit infrastructure to ensure that Canada's public transit systems continue to improve our quality of life.

Endnotes

1. Public transit consists of transportation systems -- such as streetcars, buses, and subways - that convey members of the general public. Public transit infrastructure includes the railways, subway systems, tunnels, electric wires, terminals and other basic facilities and services necessary for those transportation systems to function.
2. A trolley is a bus that runs on rubber tires (does not follow a track) and is powered by two overhead electric wires.
3. Commuter-rail systems offer service between metropolitan and suburban areas.
4. Light rail transit (LRT) opposed to "heavy rail" or subway, is a low-cost, electric-powered system. It operates either in mixed traffic or on an elevated right of way. Overhead power delivery is common but not universal and LRT passenger cars are usually lighter and smaller than heavy rail cars.
5. See http://www.stcum.qc.ca/en-bref/tramways/description/S1711_6.htm for a photo of a winter tramway in Montreal in 1877.
6. <http://www.stcum.qc.ca/English/en-bref/a-1910.htm>

7. http://www.infrastructure.gc.ca/csif/publication/newsreleases/2004/20040507mississauga_e.shtml
8. http://www.infrastructure.gc.ca/csif/publication/newsreleases/2004/20040330toronto_e.shtml

For More Information

[British Columbia Archives](#) - Site includes information on films such as "Going to Town," which is a 1948 film on Vancouver's growing traffic problems and BC Electric's response, including the start of its switchover from streetcars to trolley buses and the removal of streetcar tracks.

[Canadian Broadcasting Corporation](#)

Canadian Urban Transit Association

- <http://www.cutaactu.ca/pdf/IssuePaperSpec1ENG.pdf>
- <http://www.cutaactu.ca/pdf/TransitMeansBusiness.pdf>
- <http://www.cutaactu.ca/pdf/IssuePaper3ENG.pdf>

City of Toronto

- http://www.city.toronto.on.ca/union_station/history.htm
- <http://www.city.toronto.on.ca/ttc/history.htm>
- http://www.city.toronto.on.ca/toronto_history/history_yongest.htm

[City of Toronto Archives](#) - Includes photos of street railway construction. See Toronto Railway Company Construction Photo (e.g., Series 8, File 6, Item 26).

[Coast Mountain Bus Company](#)

Hofstra University

- <http://people.hofstra.edu/geotrans/eng/ch6en/conc6en/omni.html>
- <http://people.hofstra.edu/geotrans/eng/ch6en/appl6en/ch6a2en.html>

[Houghton Mifflin, The Reader's Companion to American History](#)

[Industry Canada](#) - Includes historic photos of Montreal Tramways (streetcars).

[MetrodeMontreal](#) - Works of Art in the Montreal Metro, by Benoît Clairoux
Translated by Matthew McLaughlin. Includes photos of art work in the metro.

[Rapid Transit Project 2000 Ltd \(RTP 2000\)](#)

[Rinbad: Railway geography and infrastructure in Europe and around the world](#)

The Société de transport de la Communauté urbaine de Montréal (STCUM) - This site includes a photo collection of early Montreal railways and the evolution of public transit from 1861 to 1959.

- <http://www.stcum.gc.ca/en-bref/tramways/index.htm>
- <http://www.stcum.gc.ca/English/en-bref/a-autobus.htm>
- <http://www.stcum.gc.ca/English/en-bref/a-1944.htm>

[TrainWeb](#)

Transit Toronto

- <http://transit.toronto.on.ca>
- <http://www.transittoronto.org/streetcar/4002.shtml>

[TransLink, Greater Vancouver Transportation Authority](#)

[University of Manitoba](#)

[Urban Transport Technology](#)

[Vancouver TrolleyBus](#)