

Rapid Transit

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<http://transitoriented.design>

Urban Rail Transit

- Tram, also streetcar or trolley: Rail based, on or along streets
- Light Rail: Not separated from other traffic, but right of way
- Rapid Transit, also heavy rail: Full grade-separation
- Monorail: Track with a single rail
- Commuter Rail: Faster, less frequent, shared tracks with trains

Rapid Transit

Definition

- Public transport in urban areas
- Electric railways
- Exclusive right-of-way, grade-separated in tunnels or elevation
- Designated lines between stations
- Custom made trains adapted to the stations
- Typical capacity of 36 000 people per hour

Rapid Transit

Terminology

- Metro: Most common with non-native English speakers
 - Montreal Metro, Washington Metro, Los Angeles Metro Rail
- Subway, underground: Inspired by the use of tunnels
 - German: U-Bahn (Untergrundbahn), Swedish: T-bana (Tunnelbana)
 - In Britain, subway is a pedestrian underpass
- L (elevated), Skytrain: Inspired by use of viaducts
 - Chicago, Vancouver

Technology

Third Rail



Overhead Line



Stations

Island Platform

- Single platform between tracks
- Facilities can be shared
- Tracks need to diverge
- Length determined at construction
- Safety issues due to overcrowding



Side Platform

- Dual platforms on either side
- Tracks are straight
- Can be extended or later added
- Require a bridge across the tracks
- Require duplicated entrances and facilities



Platform Screen Doors

- First in Singapore 1987
- Can be full or half height
- Prevents people falling on tracks
- Reduces wind, better climate control
- Restricts access to tunnel
- Prevents litter build up
- Improve sound quality of announcements

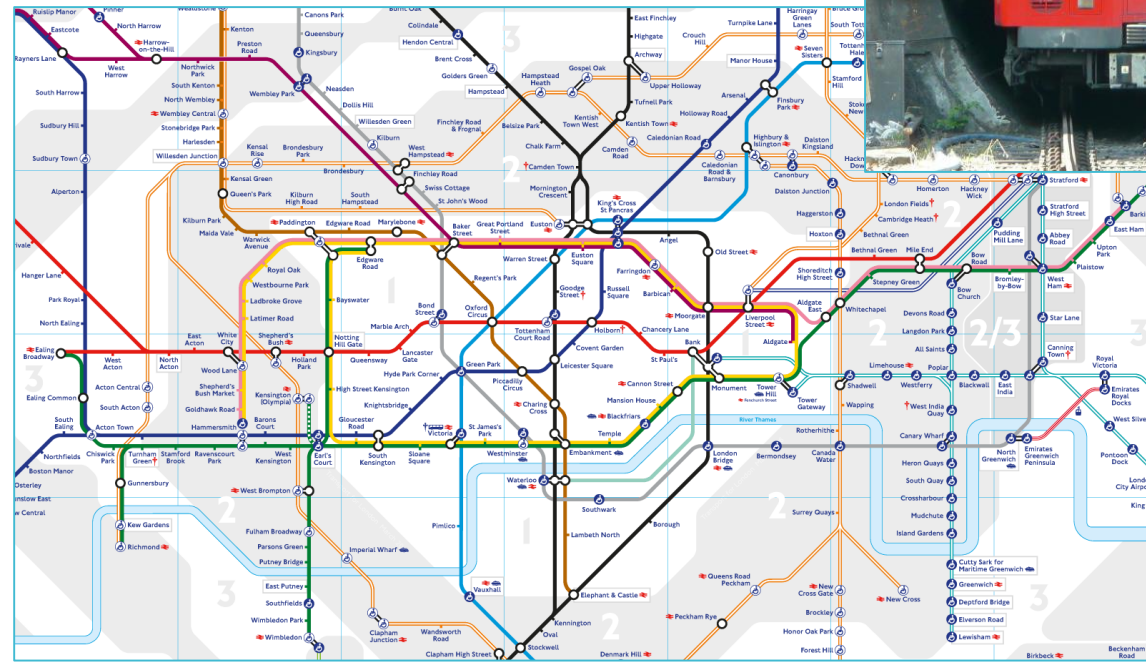




Notable Examples

UNDERGROUND

- Also called *the Tube*
- **World's first subway**; opened 1863
- 11 lines with 270 stations
- 4.8 million daily rides



MTA New York City Subway

- **World's largest subway**
36 lines with 424 stations
- Opened 1904
- 5.6 million daily rides





- **World's busiest subway** with 9.9 million daily rides
- Opened 1969
- 22 lines with 370 stations





Vancouver

Skytrain

- Elevated Rapid Transit
- 35 stations along 2 lines
- Combined length of 37.6km
- About 700 000 daily riders
- Started in 1999



Bangkok Mass Transit System (BTS Skytrain)

The Elevated Train in Commemoration of HM the King's 6th Cycle Birthday

Sky Trains

- SkyTrain (Vancouver)
- BTS Skytrain (Bangkok)
- ATL Skytrain (Atlanta Airport)
- Changi Airport Skytrain (Singapore)
- Düsseldorf SkyTrain
- Skytrain (Miami Airport)
- PHX Sky Train (Phoenix Airport)



Douglas C-47 Skytrain



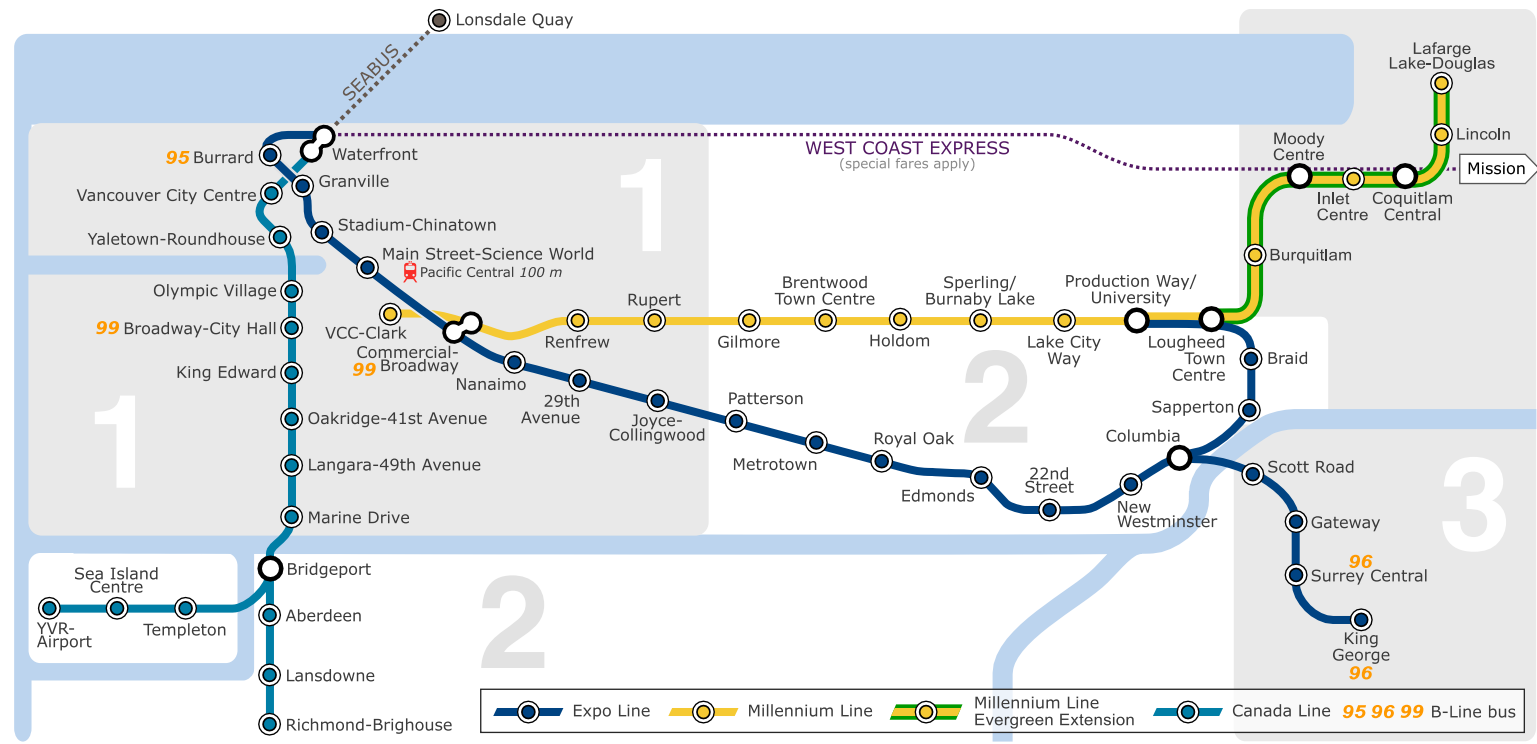
McDonnell Douglas C-9

Vancouver SkyTrain

- Opened December 11, 1985
- 53 stations along 3 lines
 - 24 on Expo Line
 - 17 on Millennium Line
 - 16 on Canada Line
- 488 980 daily rides
- 79.6 km of tracks
 - Longest rapid transit system in Canada
- Fully automated trains
 - Second longest fully automated driverless system in the world



Map



Expo Line



- Opened 1985, built for the Expo 86
 - Phase 1: Waterfront to New Westminster (1985)
 - Phase 2: Columbia and Scott Road stations (1989–90)
 - Phase 3: Surrey City Centre extension (1994)
 - Branch to Production Way–University (2016)
- Named *Expo Line* after the *Millennium Line* opened
- Linking Vancouver, Burnaby, New Westminster, and Surrey
- 24 stations over 36.4 km



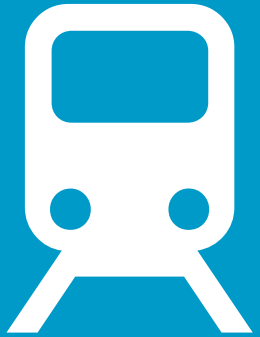
Millennium Line



- Opened 2002
 - Phase 1: Columbia to Commercial Drive (2002)
 - Lake City Way and extension to VCC–Clark (2003–06)
 - Phase 2: Evergreen Extension (2016)
 - Future Broadway Extension: West to Arbutus Street (2019-25)
- Named in recognition of the new millennium
- Linking Vancouver, Burnaby, Coquitlam, and Port Moody
- 17 stations over 31.2 km



Canada Line



- Opened 2009
 - 16 stations built originally
 - 3 additional stations planned for the future
- During planning called *Richmond-Airport-Vancouver Line* (RAV)
- Referred to as *Olympic Line* in early documents based on the 2010 Winter Olympics
- Linking Vancouver, Richmond, and YVR
- 16 stations over 19.2 km



Rolling Stock

UTDC ICTS Mark I

Expo and Millennium Line

- Built by the Urban Transportation Development Corporation
- 12m long cars with 2 doors each
- Originally used in two-car or four-car configurations
- Since 2016, usually as six-car configuration
 - 72m long trains
 - Capacity of 480 passengers
- Repainted with the shift from BC Transit to Translink in the 1990s



Rolling Stock

Bombardier ART Mark II

Expo and Millennium Line

- Built by Bombardier Transportation, manufactured in Burnaby
- 33m long twin units
- Originally used in two-car configurations
- Since 2010, usually as four-car configuration
 - 69m long trains
 - Capacity of 520 passengers
- Different paint for the second order of cars



Rolling Stock

Bombardier Innovia Metro 300 (ART Mark III)

Expo and Millennium Line

- Built by Bombardier Transportation
- Added in 2016
- Fixed 4 car configuration
 - 68m long trains
 - Capacity of 532 passengers
- Reduced number of seats in the interior

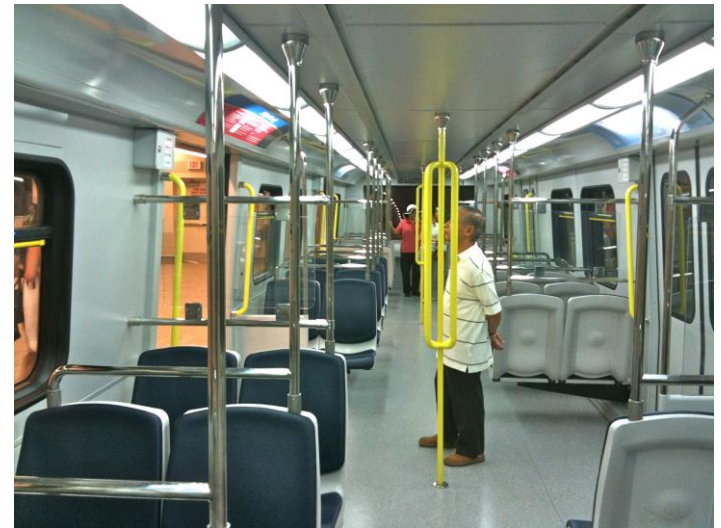


Rolling Stock

Hyundai Rotem EMU

Canada Line

- Built by Hyundai Rotem in South Korea
- Incompatible with the other SkyTrain lines
- Wider and longer than other train cars with more space for luggage
- Usually 2 car configuration
 - 41m long trains
 - Capacity of 334 passengers



HYUNDAI Rotem



Metro Vancouver Transit Police

- Police force for Translink
- Formed in December 2005
- Only police force in Canada solely dedicated to transit
- Same authorities and powers as other police



Merch

