



2017 Transit Service Performance Review

# SkyTrain and West Coast Express

Report Definitions & Assumptions



The TSPR was developed using data assumptions and relies on important definitions. This section outlines the assumptions and definitions that are critical to understanding this material for the Expo/Millennium Line SkyTrain, Canada Line SkyTrain, and West Coast Express (WCE) rail lines

## Rail Line Indicators

*Note that the Expo and Millennium Lines are presented together.*

### Key Characteristics

#### Line Length

One-way length of specific rail line, including any branches (i.e. Length of main line + length of branch 1 + length of branch 2).

#### Year Opened

The year when the specific rail line first opened to the public.

#### Number of Stations

The number of stations along the specific line.

#### Average Speed

Average Speed is calculated by dividing the line length by the average end-to-end travel time and presented in kilometres per hour.

#### Population/Employment (800m buffer)

The number of people who live/work within 800m from the centreline of the specific rail line. This measure does not take stations into account (Census by MapInfo and adjusted for census undercounts).

#### Service Changes

Comments regarding service changes implemented between January 1, 2011, and December 31, 2017. Service changes are implemented to address issues related to service performance, system maintenance, or construction.

## Ridership

### Annual Station Boardings

Number of total annual station boardings associated with the given line. A station boarding is a station entry into a fare paid zone that occurs prior to a boarding on a rail line. Station boardings do not include station entries in which someone enters and exits a station without using the transit service or transfers between different platforms within the same fare paid zone. For example, transfers between lines or branches at Commercial-Broadway, Lougheed Town Centre, Production Way-University, Columbia, and Bridgeport Stations are not counted as station boardings. Transfers between the Canada Line and Expo Line at Waterfront Station are counted as station boardings because customers do not remain in the same fare paid zone.

### Average Daily Station Boardings

Average daily station boardings for the given line are calculated dividing annual station boardings for the given calendar year by the number of days per year organized by day type.

## Service

### Service Car-Hour

A unit by which the supply of rail transit service is measured. One service car-hour is equal to one rail car in operation for one hour. Because train lengths may vary (a train consists of two or more cars), measuring rail transit supply at the service car-hour allows for standardization across all train sets. For Millennium/Expo Line and WCE these hours include both revenue and non-revenue (i.e. “deadhead”) hours. For Canada Line these hours include only revenue hours.

### Service Car-Kilometre

A unit by which the supply of rail transit service is measured. One service car-kilometre is equal to one rail car traveling one kilometre. Because train lengths and average operating speeds may vary, measuring rail transit supply at the service car-kilometre allows for standardization across all train sets.

### Capacity-Kilometre

A unit by which the supply of transit capacity is measured. Capacity-kilometres are a function of the trip distance and vehicle spaces.

*= Avg. Rail Car Passenger Capacity \* Annual Service Car-Kilometres*

Therefore, it captures the capacity along the entire route. Because vehicle capacities may vary across the system, measuring transit service at the capacity-kilometre allows for standardization across all modes.

## Cost

### Annual Operating Cost

The operating cost of the given line per year (provided by TransLink Finance). Operating cost includes salaries, contracted services, maintenance and materials, fuel and other. It excludes amortization and interest.

### Cost per Capacity-Kilometre

The operating cost to provide one unit of passenger capacity along the given line.

*= Annual Operating Cost / Annual Capacity-km*

### Cost per Boarding

The operating cost to provide one boarding along the given line.

*= Annual Operating Cost / Annual Boardings*

### Cost per Car-Kilometre

The operating cost to provide one kilometre of service for one rail car along the given line.

*= Annual Operating Cost / Annual Service Car-km*

## Utilization

### Boardings per Car-Hour

Industry standard measuring ridership versus transit supply.

*= Annual Boardings / Annual Service Car-Hours*

### Boardings per Car-Kilometre

Industry standard measuring ridership versus transit supply.

*= Annual Boardings / Annual Service Car-km*

## SkyTrain Passenger Volumes

### Average Daily Passenger Volumes by Segment

Average Daily Passenger Volumes for passengers travelling between selected station pairs (two adjacent station segments) by direction.

### Rolling Hour Passenger Volume by Segment

For rail services, passenger segment volume has been measured for 60-minute time periods, reported in rolling 15-minute intervals. The total passenger volume for each segment, for each 60-minute window, has been calculated. For example, the 7:15 rolling hour passenger volume for a given segment would include all passengers traversing that segment up to 8:15. This method of calculating passenger volume for an hour better reflects actual usage and service delivery patterns, particularly during peak periods, than grouping passenger volume into clock hours. The chart shows rolling 60-min passenger volumes for a selected segment, by direction.

### Busiest Segment

For a given day-type, time period and line, this metric identifies the segment of track (i.e. the portion of track between two adjacent stations), direction of travel, and start time with the highest rolling hour passenger volume.

## Rail Station Indicators

### Key Characteristics

#### Station ID

Two-letter station abbreviation as used on rail line segment charts.

#### Sub-Region

Rail stations are allocated to one sub-region based on their geographic locations. Metro Vancouver is divided into eight sub-regions and has rail stations in the following six (of the eight) sub-regions:

- Burnaby/New Westminster
- Maple Ridge/Pitt Meadows (WCE stations)
- Northeast Sector
- Richmond
- South of Fraser
- Vancouver/UBC

In addition, a WCE station is located in Mission which is outside of Metro Vancouver and not classified as a Metro Vancouver sub-region.

Dividing the Metro Vancouver area into sub-regions allows for enhanced local involvement in transit planning and creation of a vision for the future within a sub-regional context, addressing land use, transit supply and supporting infrastructure.

#### Municipality

In addition to sub-region, rail stations are also allocated to a municipality based on their geographic locations. TransLink has rail stations in the following municipalities:

- Burnaby
- Coquitlam
- Maple Ridge (WCE)
- New Westminster
- Pitt Meadows (WCE)
- Port Coquitlam (WCE)
- Port Moody
- Richmond
- Surrey
- Vancouver

In addition, a WCE station is located in Mission which is outside of Metro Vancouver.

### Population/Employment within 800m

Number of people living/working within 800 meters from the specific rail station (Census by MapInfo and adjusted for census undercounts).

### Year Opened

The year when the station was opened to the public.

### Platform Type

This indicator describes the type of platform location. There are two main platform types with variations:

- Centre: one common platform, between two tracks, serving trains in both directions
- Side: two separate platforms, each serving one track with trains in one direction (some stations have platforms on separate levels (stacked) or only one platform (single))

### Platform Level

This indicator describes the design of the platform level at the selected station. There are three different platform levels:

- Below ground
- At ground level
- Elevated

### Number of Fare Gates

This station characteristic indicates the number of fare gates at the selected rail station. The number of fare gates varies between three to 19 fare gates depending on the selected station, and may be located at multiple entrances.

### Connecting Routes

Nearby bus routes, including station exchange or on-street stops, that offer customers the opportunity to transfer between rail and bus service. Connecting bus routes are a key contributor to ridership at a given rail station.

### Station Changes since 2011

Comments regarding station changes implemented between January 1, 2011, and December 31, 2017, are included. Station changes typically result from maintenance, rehabilitation, or other upgrade projects performed by TransLink and to accommodate adjacent private developments.

## Performance

### Annual Station Boardings

This indicator describes the total annual station boardings (one person entering a rail station and boarding a train) at the selected station. Taps flagged as “undone” (taps in and out of the same station within 21 min) are excluded.

### Average Station Boardings by Day Type

Average number of daily station boardings for selected station organized by day type (Mon-Fri, Sat, and Sun/Hol).

### Station Boardings/Alightings per Hour

Average station boardings and alightings by clock hour organized by day type at the selected station.

## Data

Rail data for this 2017 TSPR was collected from the following data sources:

### **Compass Card**

Rail line (for Expo/Millennium, Canada, and WCE) and station level ridership data were collected from Compass for 2017 and 2016.

The Compass Card system, including closed fare gates at SkyTrain stations, was not fully implemented until July 2016. Therefore, Compass Card data for 2016 include only data from August 1<sup>st</sup> to December 31<sup>st</sup>.

An inflation factor for all SkyTrain metrics (boardings, alightings, volumes) has been used to account for boardings that have either an unknown origin or destination. These inflation factors are mode and year specific and are calculated based on the difference between known boardings and alightings (by origin and destination, respectively) and final annual ridership.

### **British Columbia Rapid Transit Company (BCRTC) Performance Monitoring**

Service level indicators, e.g. capacity-km, car-hours, and car-km, were provided by BCRTC Performance Monitoring data.

### **TransLink Finance**

Annual Operating cost was provided by TransLink Finance.

## Limitations of the analysis

This performance review does not consider external factors that may impact transit ridership including fare increases, fuel prices, economic conditions, and others. All these factors were assumed to have affected all services across the transit system equally and are not analyzed in this performance review.