

Surrey Langley SkyTrain Project Business Case

Appendix I

Operating Cost Memo

March 2022



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1. Purpose of Memo

This document provides the estimated Incremental Operating and Maintenance (“O&M”) Costs effective as of Opening Day (“OD”) of the Surrey Langley SkyTrain Project. The document is developed by the Project Team in consultation with various operating groups within TransLink.

For the funding request of this business case, the Project would extend the SkyTrain Expo Line from the existing King George station along Fraser Highway to 203 Street in the City of Langley. The Project would introduce eight new SkyTrain stations east of King George along the Fraser Highway Corridor. The total length of the extension is 16 km of elevated guideway with a linear track length of approximately 32 km. Additionally, a procurement of 30 SkyTrain cars is estimated. Service is expected to begin in 2028.

The O&M costs in this memo are presented in 2021\$ – for clarity, the costs have not been escalated for the year they occur in and have not been discounted in 2021\$ (the financial year when the costing was prepared). The analysis period used is 25 years after the SLS Opening Day, consistent with the requirement on the British Columbia Ministry of Transportation & Infrastructure (“BC MoTI”) Benefit Cost Analysis Guidebook.

2. Surrey Langley SkyTrain O&M Cost Estimate

The following O&M cost categories were included in the development of the operating cost estimation for the Project:

- British Columbia Rapid Transit Company (BCRTC) O&M cost;
- Coast Mountain Bus Company (CMBC) bus operation savings;
- CMBC Infrastructure O&M cost;
- Compass O&M cost;
- Metro Vancouver Transit Police (MVTP) O&M cost;
- Transit Security office maintenance cost; and
- Insurance O&M cost

More detailed assumptions for each of the O&M categories are summarized in the following sub-sections.

The Project’s O&M Cost was estimated based on active consultation with various TransLink operating groups, and the assumptions and quantities estimated in the SLS Reference Concept Design (“RCD”) developed as of November 2021.

2.1 British Columbia Rapid Transit Company (BCRTC) O&M Cost Estimation

2.1.1 BCRTC O&M Cost Estimation Methodology

The SLS incremental operating cost as at opening day (OD) is based on the 2022 BCRTC operating budget (excluding allocated costs). The cost and headcount per cost driver is therefore based on the approved operating model for 2022, as such the estimated cost and headcount for SLS do not account for any changes to the BCRTC operating model that may occur between the finalized date of this memo and OD. Please refer to the Assumptions, and Exclusions sections for further details.

To determine the unit cost and headcount per cost driver, the following was completed based on the consultation and input of BCRTC stakeholders:

- a. validation of the 2022 budget base number of units per cost driver
- b. allocation of 2022 operating budget to one or multiple cost drivers for each cost centre
- c. allocation of 2022 budgeted headcount to one or multiple cost drivers for each cost centre

SLS cost driver inputs are based on the project quantities information available as of December 20, 2021. The operating cost was adjusted to 2021\$ for the purpose of this analysis.

Cost Drivers

The BCRTC estimate for incremental operating cost and headcount is based on the following cost drivers:

- Control Workstations
- Stations
- Linear Track
- Propulsion Power Substations
- Elevating Devices
- Vehicle Service km
- Headcount

2.1.2 BCRTC O&M Cost Estimation Assumptions, & Exclusions

The following assumptions were made in development of the preliminary incremental operating cost for SLS:

1. General
 - a. 2022 BCRTC budget represents an accurate reflection of the costs to operate and maintain the current Expo and Millennium lines. However, this may not be reflective of future operating models (see exclusions).
 - b. Centralized services (i.e., Business Technology Services, Human Resources) will continue to be provided by TransLink. These costs are excluded in this cost estimate.
 - c. Inputs provided by the project team are accurate and complete.
 - d. Inputs provided by BCRTC are based on project information available as of December 2021.
2. Vehicle Maintenance
 - a. The vehicles used will be of similar complexity and quality as those currently in service.

3. Guideway
 - a. The complexity of the rail will be similar to that which is now in service.
4. Facility Maintenance
 - a. The sizing and access of the stations will be similar to the mix currently in service.
 - b. The facility asset replacement life cycle is every fifteen years.
5. Operations
 - a. The current level of customer service is sufficient to meet the business needs.
6. Administration
 - a. There would be an incremental increase to staffing levels.
7. Propulsion
 - a. Distance for service kilometres is based on the December 2021 SkyTrain service pattern assumptions provided to TICorp.
8. Redundancy
 - a. System redundancies will be built to 2022 standards.
9. Interface / Signal System
 - a. All systems will have a common interface and signaling system.
10. Warranty
 - a. All vendor warranties will be transferred to BCRTC.
11. 5-Car Train storage location
 - a. A location at some point along the system will be provided to store a 5-car train or equivalent length.
12. Staff Facilities
 - a. The project will build two field operations facilities for 85 people for an operations report location – One main report location (166th) & One sub-report location (203rd Terminus).
13. APTA Escalator Standards
 - a. All assets deployed will meet APTA standards as of 2022.
14. Crossovers and Pocket Tracks
 - a. 14 crossovers and 2 siding tracks for KG-Langley (32 switch groups)
15. Stations
 - a. 8 stations for KG-Langley
16. Propulsion Power Substations
 - a. Propulsion power substations for mainline track King George-Langley
17. Project Schedules will be a minimum of 12 months apart without any overlap with Broadway Subway Project.
18. Headcount
 - a. Headcount presented in this model are assumed to be full-time equivalent staff persons as the proportion of part-time staff in the 2022 budget is immaterial in this estimate.

Key Exclusions of the O&M cost estimates are listed below (Please note that this is not an exhaustive list):

1. General
 - a. Any allowance for maintenance above the current levels provided by BCRTC.
 - Cost drivers exclude future vehicle overhaul costs
 - b. Detailed analysis of individual items to assess potential impact.
 - c. Any allowance for future capital projects or replacement.
 - d. Depreciation has not been included.
 - e. All project activities (design support, construction support, testing and commissioning, start-up, integration, etc.) will be fully funded outside of operations and maintenance.

- f. Does not allow for any increase for train storage, office space, stores or maintenance facilities.
- 2. Vehicle Maintenance
 - a. Any allowance for additional vehicle costs due to additional complexity of new trains.
 - b. Any change in maintenance frequency.
- 3. Guideway
 - a. Any allowance for additional complexity of the rail or change in inspection rates.
- 4. Facility Maintenance
 - a. No allowance has been made for increases in the average number of elevator/escalators per station or average square footage of glazing.
 - b. No additional maintenance workspace provided for equipment, tools, remote maintenance staff reporting.
- 5. Stores and Warehousing
 - a. No allowance has been made for additional stores and warehousing space.
- 6. Operations & Maintenance Centre 5 (OMC5)
 - a. Estimate assumes current operating model as of the 2022 budget year, additional facilities or report locations (to accommodate response teams) have not been included and would require fixed cost investment in addition to proportional increases.
 - b. There are no provisions for any OMC and large capacity for fleet storage.
 - c. Operations and maintenance costs associated with OMC5 are excluded from this cost estimate.
- 7. Capital Projects
 - a. Ongoing operating cost or impacts as a result of other capital projects implemented between 2022 and OD.
- 8. Asset Management
 - a. No allowance has been made herein to account for future state asset management practices, which will be an outcome of the Enterprise Asset Management program
- 9. Training
 - a. Estimate assumes all training of existing and new staff, as well as new curriculum development, will be funded through the SLS start-up budget.
- 10. Allocated Costs
 - a. Estimate excludes all allocated costs, including but not limited to shared services (Human Resources, Business Technology Services), property taxes, fare media, insurance, etc.
- 11. Field Operations
 - a. Service plan changes (i.e., 90-second headways) and the potential additional staff requirements to support this service level
- 12. WorkSafeBC Requirements
 - a. The current estimate excludes any future WorkSafeBC requirements (Guideway fencing, sprinklers at stations, etc.) that have operating cost which have not been accounted for in the 2022 budget.

2.2 Coast Mountain Bus Company (CMBC) Bus Saving

2.2.1 CMBC Bus Saving Estimation Methodology

Through initial consultation with TransLink Service Planning and CMBC, high-level SLS bus integration

assumptions were estimated in October 2021, which bring about a net saving of approximately 86,000 annual service hours, with the SLS extension to 203 Street in the City of Langley.

2.2.2 CMBC Bus Saving Assumptions

The following **assumptions** were made in development of the annual CMBC bus saving as a result of the SLS extension:

1. General:
 - Current routing (base case) assumes no interlining.
 - No additional distance / cost for Langley shuttle routes to terminate at the 203 Street transit exchanges.
2. Bus Frequency / span:
 - Base case created using September 2019 frequencies and span; increased frequencies on some routes between 2019 and 2021 have nominal impact on savings and will not be updated.
 - No changes to frequencies / span for proposed bus changes.
 - Where frequencies differ in each direction, lower frequency will be used when proposed changes will result in savings; higher frequency will be used when proposed changes will result in added cost.
3. Bus speed:
 - Using Scheduled Average Speed by hour.
 - Assume no change to speed from base case for proposed changes.
4. Bus distance estimation:
 - Distance calculated for base case and proposed routing.
5. Bus recovery:
 - Minimum of 15% bus recovery is assumed.
6. Route 345 – assume any savings will be reinvested into route 375 (net neutral).

2.3 CMBC Infrastructure O&M Cost Estimation

2.3.1 CMBC Infrastructure O&M Cost Estimation Methodology

Through initial consultation with CMBC Infrastructure team, assumptions of the cost metrics were used to develop the O&M cost estimation. The cost estimate was based on Project information provided as of November 2021.

2.3.2 CMBC Infrastructure O&M Cost Estimation Assumptions & Exclusions

The following **assumptions** were made in development of the CMBC Infrastructure O&M cost estimate of the Project:

- Operational and maintenance activities and costs of the new Bus Exchanges are similar to those of the existing facilities.
- CMBC is only responsible for the maintenance of the pavement in the dedicated bus area.

Key Exclusions of the O&M cost estimates are listed below (Please note that this is not an exhaustive list):

- Escalation costs.

- Snow removal.
- Maintenance of public art piece.

2.4 Compass & Radio Frequency Identification (RFID)

2.4.1 Compass and RFID O&M Cost Estimation Methodology

Through consultation with TransLink's Compass and RFID teams, the cost metrics were developed based on the fee schedule of the existing Compass and RFID contracts (confidential third-party information) as of November 2021. The quantities used in the cost estimation was based on Project information provided as of November 2021.

2.4.2 Compass and RFID O&M Cost Estimation Assumptions & Exclusions

The following assumptions were made in development of the Compass and RFID O&M costs as a result of the Project:

- No changes or deviation from current device functionalities and Compass and RFID Infrastructure Supplier and Contractor O&M scope.
- Unit cost assumed is based on current contract cost. Of note, the current contract expires prior to expected SLS opening.

Key Exclusions of the O&M cost estimates are listed below (Please note that this is not an exhaustive list):

- Any allowances for maintenance above the current levels provided by Compass and RFID Contractors.

2.5 Metro Vancouver Transit Police (MVTP) O&M Cost Estimation

2.5.1 MVTP O&M Cost Estimation Methodology

Through consultation with the Transit Police team, the cost metrics were developed based on the operating cost of transit police officers / programs and supporting facilities associated to forecasted ridership and project infrastructure (confidential third-party information). The cost estimate was based on Project information provided as of November 2021.

2.5.2 MVTP O&M Cost Estimation Assumptions & Exclusions

The following assumptions were made in development of the MVTP operating cost as a result of the Project:

- No significant change to the current policing model.
- Planning figures only take into consideration the SLS project, ridership and MVTP planning data available as of November 2021. These planning figures have not yet taken into consideration the impact of other programs that may be developed within the regional transit system.

Key Exclusions of the O&M cost estimates are listed below (Please note that this is not an exhaustive list):

- Operating cost of the MVTP deployment office near one of the SLS stations.
- Any operating and maintenance allowance for future capital projects or replacement outside the current scope of the Project.
- Potential increased costs for material, training or salaries.

2.6 Coast Mountain Bus Company (CMBC) Transit Security (TS) O&M Estimation

2.6.1 Transit Security O&M Cost Estimation Methodology

Through consultation with the Transit Security team, the cost metrics were developed based on the operating cost assumption of TS facility maintenance as of November 2021. The cost estimate was based on Project information provided as of November 2021.

2.6.2 Transit Security O&M Cost Estimation Assumptions & Exclusions

The following **assumptions** were made in development of the Transit Security operating cost as a result of SLS (extension to Langley Centre):

- No significant change to the current Transit security model.
- Planning is based on the SLS project and current Transit Security forecasting.
- Increase in Ridership from King George beyond to Langley Center.

Key Exclusions of the O&M cost estimates are listed below (Please note that this is not an exhaustive list):

- Any allowance for facility maintenance costs above the current levels provided.
- Any additional vehicle and noted outfitting costs beyond 2023
- Increased costs for material, training, and salaries beyond estimated inflation rate.

2.7 Insurance O&M Cost Estimation

2.7.1 Insurance Cost Estimation Methodology

The insurance cost was estimated based on assumed insurance rates, Project's estimated asset values and new ridership projections as of January 2022.

2.7.2 Insurance Cost Estimation Assumptions

The following **assumptions** were made when estimating the Project's insurance costs:

- Insurance rates can vary considerably over time and this variability cannot be reliably estimated. For the purpose of calculating the annual insurance cost for the 25-year O&M period, a 1% rate increase per year was assumed. Sensitivity analyses on the annual insurance rates may be performed.
- Asset are insured on a replacement cost, not actual cash value, basis, and a 3% cost increase

per year was assumed.

- The new ridership represents the number of people who are newly added users of the TransLink services (i.e., shifted from a non-transit mode) and a 2% increase in ridership per year was assumed based on ridership estimates provided by the Project team in January 2022.