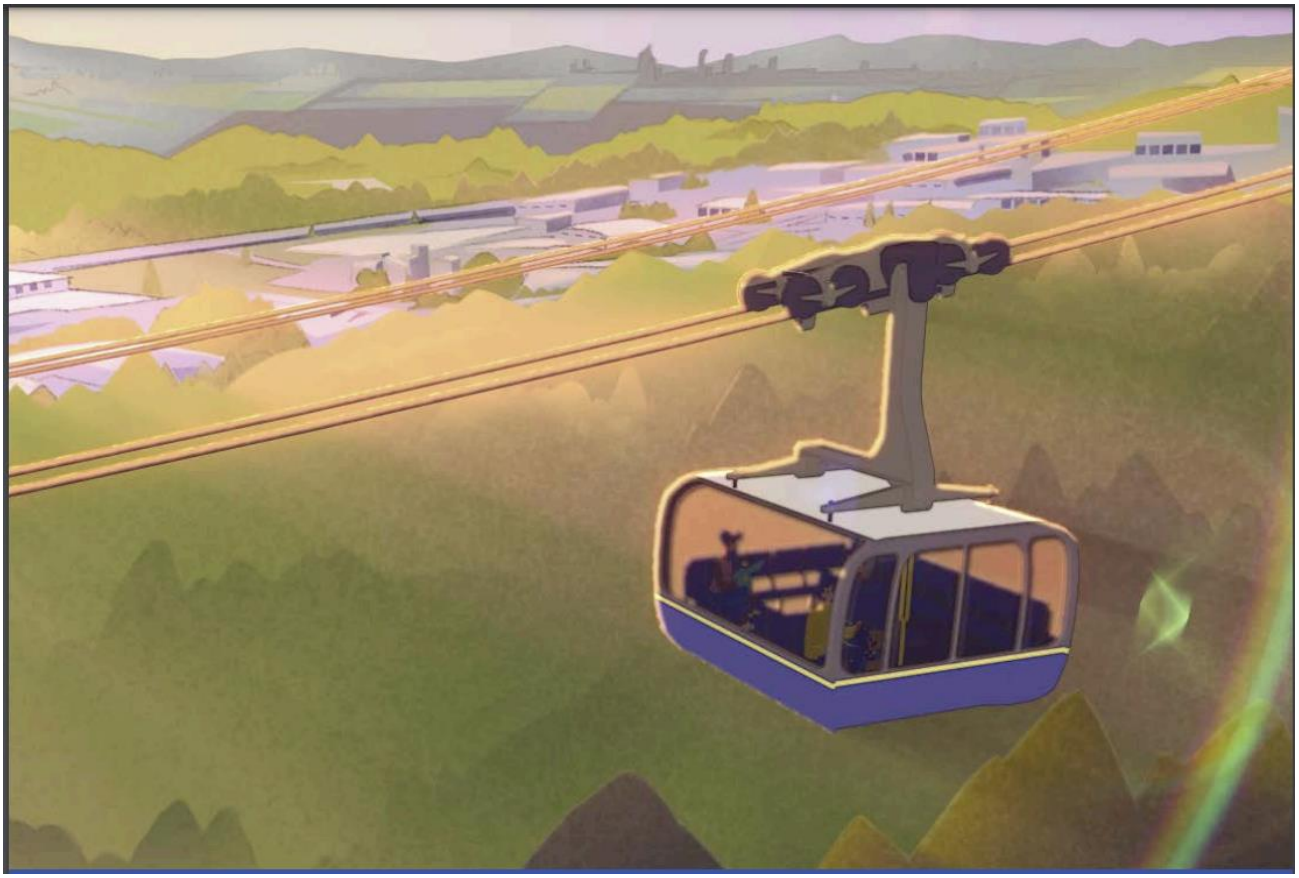
Burnaby Mountain Gondola

Environmental Screening Review

Terms of Reference

April 12, 2024



Prepared by:

Ausenco Sustainability ULC
4515 Central Boulevard, 18th Floor
Burnaby, BC V5H 0C6

Prepared for:

TransLink
400-287 Nelson's Ct.
New Westminster, BC V3L 0E7

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Abbreviations

A list of the acronyms and abbreviations used in the Terms of Reference is below.

Abbreviation	Definition
BC	British Columbia
BMG	Burnaby Mountain Gondola Project
CEMP	Construction Environmental Management Plan
ESR	Environmental Screening Review
GHG	Greenhouse Gas
Project	Proposed Burnaby Mountain Gondola Project
SE	Screening Element
3S	3 Cable Gondola System
RCD	Reference Concept Design
ROW	Right-of-way
SFU	Simon Fraser University
TOR	ESR Terms of Reference
TransLink	South Coast British Columbia Transportation Authority

Symbols and Units of Measure

A list of the symbols and units of measure used in the Terms of Reference is below.

Symbol/Unit of Measure	Definition
km	kilometre
m	metre
mm	millimetre

1 Introduction

The proposed Burnaby Mountain Gondola Project (BMG or the Project) would provide a fast, frequent, and reliable service between the SkyTrain and Burnaby Mountain. A gondola offers more frequent service for our customers, can move more people per hour than buses, reduces greenhouse gas emissions, and has lower operating costs than buses.

This Terms of Reference (TOR) outlines the methods and scope of issues that will be considered in the Project's Environmental Screening Review (ESR), which will report on the assessment of potential Project-related environmental effects. The ESR process will support the Project's commitment to transparency while facilitating the design of a project that is informed by First Nations, public, and stakeholder input. The ESR will also demonstrate the Project's commitment to studying and appropriately managing environmental risk and ensuring consideration of relevant information during procurement, construction, and operation. This finalized TOR incorporates feedback from engagement with the First Nations, public, and stakeholders.

1.1 Proponent

The Project is being delivered by the South Coast British Columbia Transportation Authority (TransLink).

The mailing address for the Project is:

400-287 Nelson's Ct.
New Westminster, BC V3L 0E7
Website Address: Burnaby Mountain Gondola | TransLink

Once operational, the BMG will be seamlessly integrated with Metro Vancouver's transit network. Regulatory Context

The Project comprises approximately 2.7 kilometres (km) of aerial ropeways and is not reviewable under provincial or federal environmental assessment processes. Neither the BC *Environmental Assessment Act* (SBC 2018) nor the federal *Impact Assessment Act* (S.C. 1992, c. 37) consider aerial ropeways under their legislation. The Project does not exceed the thresholds set out in the Reviewable Projects Regulation (B.C. Reg. 243/2019) of the BCEAA or the Physical Activities Regulations (SOR/2019-285) of the *Impact Assessment Act*. However, notification requirements under the *BC Environmental Assessment Act* are triggered if a project will result in peak employment by the proponent of at least 250 full-time employees. TransLink will provide this notification, should the Project exceed this threshold.

Federal and provincial environmental permits for construction-related Project activities, such as new or modified watercourse crossings, contaminated soil handling, heritage inspection or others, will be obtained prior to initiation of the activity requiring that approval.

1.2 Background

TransLink has been assessing feasibility of gondola technology to connect the SkyTrain system with Burnaby Mountain since 2009. Steps in the development of concepts and approvals have included:

- 2009: Initial feasibility study commissioned by Simon Fraser University Community Trust;
- 2011: Initial business case commissioned by TransLink to assess alternative technologies, route options, costs and benefits; preferred solution identified an alignment from the Production Way--University SkyTrain Station to the Simon Fraser University (SFU) Town Square, using 3S[1] gondola technology;
- 2014: Mayors' Council's 10-Year Vision for Metro Vancouver Transit and Transportation included a high-capacity connection between SkyTrain and Burnaby Mountain and recommended further study and consultation;
- 2016: TransLink's Phase 1 Investment Plan identified a gondola as a feasible solution;
- 2017: TransLink commissioned an updated feasibility study which concluded that a gondola was still a feasible and cost-effective solution;
- 2020: TransLink began assessing three alternative routes; and
- 2021:TransLink's Route Selection Report concluded that Route 1, the straightest alignment, had the most public support, the greatest benefits, the least cost and the fewest implementation considerations.

Additional information on these initiatives is available at www.translink.ca/gondola.

Project development for the BMG will include preparation of Supportive Policy Agreements with the project partners, City of Burnaby and Simon Fraser University. These partnering agreements will seek to:

i. Specify supportive land use and transportation policies to coordinate and integrate with transportation and land use planning in the Project corridor; and

ii. Identify specific actions and policies to coordinate and integrate with transportation and land use planning.

First Nations, stakeholder and public engagement on the TOR was carried out in 2023, which included circulation of the draft TOR for review and comment. Feedback from this engagement and ongoing First Nations engagement into this final TOR resulted in refinements of the assessment scope, including that for land use; vegetation and wildlife; noise and vibration; and accidents and malfunctions.

[1] The 3S system consists of two fixed track ropes on which the carrier travels and a circulating haul rope which the gondola cabins clamp on to.

2 Project Description

BMG will improve transit time, reliability and capacity to and from SFU and UniverCity area neighbourhood of Burnaby Mountain by providing a new gondola service connecting to the existing Production Way- University SkyTrain station (**Figure 2-1**). BMG will reduce transportation-related Greenhouse Gas (GHG) emissions, reduce transit operating costs and improve overall transit customer travel time and experience compared to the current bus connections. The design and location of the gondola are guided by previous analysis including a Feasibility Study and Route Options Evaluations of BMG, engagement with SFU, City of Burnaby and First Nations, TransLink planning documents, as well as Metro Vancouver's broader regional growth plans for transportation, population, and employment.

The BMG will provide high-quality rapid transit that will increase transit mode share and help shape land use to support and align with federal, provincial, regional, and municipal goals. Currently, TransLink is progressing with work to prepare a full business case for TransLink and funding partner approvals. Work is also advancing the inclusion of approvals for BMG construction in a new TransLink Investment Plan (see **Section 2.4** Project Schedule below for further details).

Figure 2-1 Overview of the Proposed Alignment

2.1 Project Design Principles

The following overarching design principles will support the development of the BMG:

Transit

- Provide a fast, frequent, and reliable rapid transit service between the SkyTrain and SFU; and
- Provide a safe, inviting, and sustainable service.

Residential

- Minimize privacy impacts by separating the gondola from residences;
- Minimize properties crossed to limit potential effects; and
- Locate towers away from residential areas to minimize potential effects.

Environmental

- Limit towers in environmentally sensitive areas;
- Limit the number of towers or utilities in the Burnaby Mountain Conservation Area;
- Minimize tree loss and habitat disruption; and
- Avoid watercourses and watercourse setbacks.

Utilities

- Avoid placing towers near utility rights-of-way.

Land Use

- Understand impacts to potential redevelopment sites near terminals;
- Minimize project complexity regarding property ownership and processes; and
- Minimize disturbance to adjacent lands.

2.2 Project Components

This section presents an overview of the Reference Concept Design (RCD), which will be described in more detail and assessed in the ESR. The key components of the BMG are the alignment, elevated ropeway, towers, terminals, cabins and supporting infrastructure requirements. BMG would provide a peak travel time of 6-minutes between SkyTrain and Burnaby Mountain (compared to a typical bus trip of at least 15 minutes).

2.2.1 Alignment

Figure 2.1 shows the plan view of the alignment and Figure 2.2 shows the BMG vertical profile. The vertical alignment for the corridor is governed by the tower heights and ropeway sag between towers, as illustrated in Figure 2.2. The horizontal alignment between the Lower Terminal and Upper Terminal is planned to be straight (i.e., no bends/deflections at towers). Unlike hydro transmission corridors, the BMG aerial right-of-way alignment will remain treed, as shown in **Figure 2-2**.

Figure 2-2 Vertical Alignment of the Burnaby Mountain Gondola

2.2.2 Elevated Ropeway

BMG will use a tri-cable elevated ropeway system (3S gondola) which includes two track ropes, a haul rope and slack carriers. **Figure 2-3** shows an example of a 3S gondola in operation (located in Toulouse, France). The benefits of a 3S gondola system include: the ability to operate in high wind conditions, sufficient ridership capacity, and energy-efficiency, which results in lower operating costs.

Initial planning indicates this could require an aerial right-of-way (ROW) approximately 20 metres (m) wide to operate. A minor amount of tree removal is anticipated to be required for system clearance between each terminal and the adjacent tower. To help mitigate privacy concerns, between Towers 2 and 3, the ropeway will be positioned so that the cabins would pass at least 45m above existing residential buildings.

2.2.1 Towers

For 3S gondolas, tower types include lattice, monopole, and custom towers. For BMG, lattice towers are currently assumed as they have less visual presence/impact than other tower types and are more cost-effective than other tower types. Towers are expected to range between approximately 20m and 100m in height. For Towers 3 and 4, some vegetation removal will be required for the permanent footprint (up to 30 m x 30 m) as well as a cleared zone for construction workspace and tower maintenance during operations. Innovation in tower design is being considered to minimize at-grade footprint effects.

2.2.2 Terminals

The BMG Upper and Lower Terminals are expected to provide the key functional needs for TransLink's customers and for operations and maintenance and be accessible and well-integrated with other modes (e.g., SkyTrain, buses, active transportation). The Lower Terminal will be located adjacent to the Production Way-University SkyTrain station. The Upper Terminal will be located adjacent to the SFU Cornerstone Mews, south of the Bus Exchange. Terminals will include space for operating booths, gondola cabin storage, rooms for control and monitoring, machinery, and staff facilities. Parking for service vehicles, emergency vehicles and staff are also needed near each terminal. Gondola cabins will be stored

inside the Lower Terminal when the BMG service is not in operation. To seamlessly integrate in TransLink's transit network, terminals will be fare-paid zones and equipped with fare gates and fare card vending machines. **Figure 2-4** shows a preliminary terminal concept[2].

Figure 2-3 Example of a 3S Urban Gondola in Toulouse, France.

Figure 2-4 Terminal Design Concept

[2] Source: www.simagazin.com/en/si-urban-en/the-french-city-toulouse-now-has-an-urban-3s-cable-car

2.2.3 Gondola Cabins

Gondola cabins will be operated remotely from the Upper and Lower Terminals, with two-way communications with the operator provided for safety and security. The height from the cable to the bottom of the cabin is about 6 m. Gondola cabin exteriors will measure approximately 3.7 m^2 and 2.5 m high. Gondola cabins will have a door on one side and be able to accommodate about 30-35 people. Cabin windows are not proposed to open. Passive ventilation would be provided by a screened opening. Their maximum travel speed would be approximately 7.5m/sec (27.5 km/hr) between terminals. When not in operation, cabins will be removed from the line and stored to reduce exposure.

The cabin floor and lower walls will be solid (i.e., non-translucent). The cabin floor level will align with the platform. Cabin design will support accessibility (e.g., wheelchairs, mobility devices, bicycles, strollers, persons with a visual impairment) and provide a mix of seating and standing/flex spaces. Initial concepts call for in-cabin interior lighting as well as interior emergency lighting. No exterior cabin lighting is proposed.

2.2.4 Supporting Infrastructure Requirements

TransLink has initiated supporting infrastructure projects to integrate with the current and future operating requirements of the Production Way- University SkyTrain station and bus exchange. As BMG will be powered by electricity supplied by BC Hydro, planning has also been initiated for BMG power requirements. BMG may include reconfigured transit bus access at the Lower Terminal.

2.3 Construction Activities

The Project's main construction activities would include utility relocations and new utility services, site preparation, roadworks, civil and structural works for terminals, towers, and systems. **Table 2-1** summarizes the scope of construction work and related activities, such as project and traffic management. Additional detail will be provided in the ESR, including labour force and information on typical means and methods that could have environmental implications.

Some early works may begin in advance of main Project construction and could include utility relocation and servicing work.

Table 2-1 BMG Project Construction Activities

Project Component / Activity	Description
Management, Design, and Engineering	Project management; planning; architectural, civil, and systems engineering; procurement; systems integration; cost, quality, schedule, and environmental controls
Traffic Management	Implementation of traffic measures including signage, traffic control, temporary lane closures and temporary access closures
Utility Relocation	Relocation of buried and overhead utilities (e.g., electricity, telecommunications, municipal utilities)
Site Preparation	Ground improvement, clearing and grubbing, demolitions, drainage works
Environmental Mitigation	Implementation of environmental mitigation measures identified in the ESR and permits, which may include removal of contaminated material, habitat works, noise attenuation measures, and landscaping
Roadworks	Minor alteration of roadways, where required, to accommodate terminals, towers and bus/active transportation connections, including changes to medians and boulevards and upgrades to drainage as well as replacement of streetlights and signals, where required
Towers and Ropeway	Installation of tower foundations and superstructure, aviation warning lighting, ropeway cables and ancillary equipment
System Structures	Installation of power propulsion systems, backup systems and power distribution / communications ducts, other utility services and ancillary facilities
Upper and Lower Terminals	Construction including platform structures, lighting, access, safety barriers, service connections, fare vending machines, fare gates, plus backup and security equipment
Maintenance	Construction of maintenance facilities for cleaning and maintaining the gondola infrastructure, including cabins, cables, and towers
Testing and Commissioning	Testing and commissioning of system

2.4 Project Operation

BMG is expected to operate on a continuous daily schedule, with shutdown periods estimated to occur about twice a year for scheduled maintenance activities. It is assumed that operating hours will correspond to the first and last SkyTrain at the at Production Way-University Station with the gondola operating around 21 hours per day. During peak times, cabins are expected to depart every minute during operating hours. Gondola cabins will slow down as they enter the station to allow passengers to alight and board in separate areas. There will be attendants present in the terminal boarding and alighting areas to assist with boarding as needed.

While most maintenance will be completed without disruption to the system, the gondola will need to be shut down occasionally for major maintenance activities. These shutdowns will be scheduled in advance, during periods of low use and buses will be used to provide a temporary transit connection.

Key operational assumptions for the Burnaby Mountain Gondola include:

- Route distance: 2.7 km
- Speed:
  - Max line speed: up to 27.5 km/hr
  - Boarding and alighting speed: about 0.18 m/s (0.65 km/hr)

- Travel time between terminals: approximately 6 minutes at peak times
- Operation hours – align with SkyTrain Service hours
- Preliminary Capacity Estimates:
  - Opening day: approximately 3,000 passengers Per Hour Per Direction
  - Ultimate: 4,000 passengers Per Hour Per Direction
  - Accommodates mobility devices, strollers, and bicycles
- Peak period frequency:
  - Opening day: approximately every minute
  - Ultimate: Greater frequency
- Cabins
  - Number of Cabins: approximately 21 (opening day); 37 (ultimate)
  - Functional Capacity: 30-35 passengers (depending on supplier and equipment)
  - Stored in the Lower Terminal at the end of the operating day.

BMG terminal and tower structures are expected to have an operating life of 50+ years, while cabins, track ropes and other equipment would be replaced based on total hours of operation.

2.5 Project Schedule

BMG is in the planning phase, where the business case and the ESR are being prepared. These works will ensure there is a full understanding of Project implications, including investigating GHG emission reductions, assessing requirements for a mobility hub for the Production Way-University SkyTrain area, undertaking transportation forecasting, and undertaking archaeological assessment and First Nations engagement as well as completing the ESR. Once this is complete, design and development can proceed including finalizing the RCD and determining benefits, costs, funding options and procurement delivery.

Following business case approval by TransLink and senior government funding partners, the Project will enter the procurement phase. Procurement is expected to take approximately 12 months. Final design, construction, and testing and commissioning would then follow before the start of revenue service.

Figure 2-5 Proposed Timeline

Environmental studies began in 2020 and are ongoing. The draft TOR for the ESR is shared as part of BMG's planned ongoing First Nations engagement, as well as during the next round of public and stakeholder engagement (planned for Fall 2023). Following that, the ESR report will be completed, and the business case developed. A draft Construction Environmental Management Plan (CEMP) Framework will be prepared in advance of Project construction procurement, that will incorporate ESR findings into Project delivery and construction. Procurement, detailed design and construction are anticipated to take two to three years.

2.6 Project Benefits

The Project would provide numerous benefits, including:

- Support faster transition to a 100% net-zero transit fleet;
- Improving transit travel time – reducing total transit travel time;
- Better serving transit ridership growth;
- Increasing sustainable mode share by shifting automobile trips to transit trips through enhanced comfort, frequency, and reliability;
- Reducing local vehicle traffic and congestion and eliminating bus-related noise;
- Improving daily and seasonal transit service reliability regarding capacity, frequency, and during all weather conditions;
- Extending the rapid transit network, connecting Burnaby Mountain to the rest of the region;
- Providing an additional route to travel off Burnaby Mountain in the event of a safety incident;
- Increasing health benefits by encouraging physical activity and improving air quality;
- Lowering operating costs (compared to buses);
- Providing a clean and resilient mode of transportation that reduces GHG emissions through reductions in vehicle kilometres travelled and congestion-related idling, and
- Replacing diesel bus service with electric gondola service.

3 Scope of the ESR

The ESR will provide a description of the Project, related benefits, anticipated effects on the natural and human environment as well as mitigation strategies, and a summary of feedback from First Nations, public, and stakeholder engagement. The ESR Report will be prepared by independent third-party consultants and will include the following sections:

- Executive Summary;
- Introduction;
- Project Description;
- Project Benefits;
- First Nations Engagement;
- Public and Stakeholder Engagement;
- ESR Scope and Methods;
- Biophysical and Human Environment Assessment:[3]
  - Air Quality and Greenhouse Gases;
  - Noise and Vibration;
  - Contaminated Sites;
  - Fisheries and Aquatics;
  - Vegetation and Wildlife;
  - Archaeology and Heritage,
  - Land Use;
  - Transportation and Access; and
  - Visual Landscape;
- Accidents and Malfunctions;
- Environmental Management during Construction;
- Environmental Guidance during Operation; and
- Summary and Conclusions.

The following subsections provide an overview of the above-listed sections of the ESR.

3.1 Introduction

The introduction section will describe the following:

- Purpose of the document and the Project's objectives, including how they relate to broader private or public sector policies, plans, or programs;
- Location of the Project, including how it fits into the regional context; and
- Relevant background information, including exploratory or investigative studies as well as earlier reviews of Project alternatives.

[3] The assessment excludes cumulative effects assessment for Burnaby Mountain due to TransLink's limited jurisdiction of the area. It considers community wellbeing in multiple sections including Air Quality and GHGs, Noise and Vibration, Land Use and Transportation and Access.

3.2 Project Description

The Project Description will be based on a RCD, i.e., a design concept that has been technically assessed for feasibility. The version of RCD that has been environmentally assessed will be specified in the ESR. Design will undergo additional refinement prior to construction.

This section will present the following information:

- Identification and description of Project components and their spatial locations;
- Description of all Project stages, including Project delivery, as well as timelines for construction and operation (since the Project has no fixed end to operation, Project decommissioning is not applicable and thus will not be a subject of study);
- Description of activities associated with all components and stages of the Project;
- Outline of any "Advance Works" activities that will be undertaken by TransLink in advance of construction; and
- Regulatory context and permits potentially required.

3.3 First Nations Engagement

This section of the ESR will describe the Project's approach to First Nations engagement, which includes:

- Providing potentially affected First Nations with general Project updates, including specific environmental and archaeological information;
- Providing First Nations with opportunities to review key environmental and archaeological documents and participate in field studies, as appropriate; and
- Obtaining feedback on the Project from First Nations and respecting the confidentiality of information provided by First Nations.

This section will also summarize TransLink's engagement activities with First Nations, including:

- On overview of key comments from First Nations regarding the Project and environmental review process and TransLink's responses, including proposed mitigations; and
- Past and future engagement opportunities for First Nations on the ESR.

3.4 Public and Stakeholder Engagement

The ESR will outline engagement activities with members of the public and key stakeholders, including:

- Information on the role of the City of Burnaby and Simon Fraser University in Project development; and
- Engagement activities including a summary of past and future ESR-related engagement opportunities, description of Project-related information available to the public (e.g., display boards and survey questions), and a description of key ESR-related interests and responses, including how feedback is considered.

3.5 ESR Scope and Methods

This section of the ESR will describe methods to assess potential Project-related effects to the biophysical and human environment for Project components and activities. Development of the ESR will follow the methodology, as described below, to assess changes to environmental values, identified as Screening Elements (SEs) in this TOR. The ESR will describe the rationale for their selection, baseline conditions,

and potential Project-related changes to each SE. The ESR will also describe mitigation measures to avoid or minimize effects on the biophysical and human environment. Additional details on key elements of the ESR, such as environmental management during construction and operation, are provided in **Section 3.8** and **Section 3.9**.

3.5.1 Scoping and Selection of Screening Elements

The ESR will include a description of how each SE will be considered, the metrics to measure or describe Project-related changes to each Screening Element (SE)), as well as the spatial and temporal boundaries for the effects assessment.

Proposed SEs, identified in **Table 3-1**, were selected for the ESR based on the following criteria:

- Relevant environmental policies, legislation, and guidance;
- Potential Project-related effects;
- Elements that were assessed in other local rapid transit projects (e.g., Evergreen Line, Broadway Subway Project and Surrey Langley SkyTrain); and
- Interests and concerns identified by First Nations, the public and stakeholders.

A standard approach for the assessment methods will be employed using the following steps:

- Confirmation of the proposed SEs, spatial and temporal assessment boundaries, and Review Indicators;
- Description of baseline conditions;
- Determination of potential effects based on information and feedback identified in **Section 3.3** (First Nations Engagement) and **Section 3.4** (Public and Stakeholder Engagement);
- Identification of applicable mitigation measures;
- Identification and characterization of potential effects remaining after mitigation; and
- Summary and Conclusions.

The scope of the ESR TOR will include consideration of additional SEs that may be suggested during engagement with First Nations, the public, or stakeholders if a likely interaction can be reasonably anticipated between Project activities and the additional proposed SE.

3.5.2 Spatial and Temporal Assessment Boundaries

The ESR will include spatial boundaries for the assessment of each SE. The determination of spatial and temporal assessment boundaries will include consideration of relevant Project stages, components, and activities, as well as the potential extent of Project-related effects. Proposed spatial boundaries for each SE are presented in **Table 3-1**. The Project alignment comprises an aerial ROW approximately 20 m wide.

Table 3-1 Summary of Proposed Screening Elements

Screening Element	Rationale for Selection	Proposed Spatial Boundaries
Biophysical Environment		
Air Quality and Greenhouse Gases	During construction, the Project may affect local air quality. During Project operation, net reductions in emissions may benefit local and regional air quality.	• City of Burnaby • The Lower Fraser Valley airshed comprises the regional boundary
Noise and Vibration	Noise emissions during construction and operation may affect sensitive receptors. Vibration from construction equipment and activities may affect sensitive receptors.	• Within 150 metres (m) of the Project alignment for noise effects • Within 50 m of the Project alignment for vibration effects
Contaminated Sites	Contaminated or hazardous material may be encountered during construction.	• Within 100 m of the Project alignment and all lands required for Upper and Lower Terminals
Fisheries and Aquatics	Construction and operation may affect freshwater fisheries and aquatic resources[4]	• Watercourses and associated riparian setbacks that could interact with the Project footprint
Vegetation and Wildlife Resources	Construction may affect vegetated areas as well as wildlife and their habitat.[5]	• Vegetation: Within 10 m of the Project footprint and within 50 m of the tower and terminal locations • Wildlife: Within 200 m of the Project's proposed alignment
Human Environment		
Archaeology and Heritage	Construction may adversely affect archaeological and heritage resources.	• Within 50 m of the Project infrastructure where at-grade Project construction may affect archaeological and heritage resources
Land Use	The Project may influence land use[6] and may affect designated residential, commercial, and conservation lands along the alignment.	• Within 200 m of the Project alignment and Upper and Lower Terminals
Transportation and Access	Construction may disrupt existing traffic flows and affect access, including for emergency services. Operation may change traffic patterns, access, security, and parking around the Upper and Lower Terminals.	• Local communities, properties adjacent to the Project, and travel routes within 100 m of the Project alignment
Visual Landscape	The Project may change views for the regional landscape and local viewscapes (e.g., views from residences and areas used for recreation).	• The North of Fraser communities west of the City of Coquitlam comprises the assessment area for the regional landscape. • A radius of 300 m from the Project alignment comprises the assessment area for local viewscapes. • Street-level viewpoints will be selected to be representative of the regional landscape and local viewscapes

[4] The ESR will consider information received from First Nations on cultural significance, where this information is not identified as confidential.
[5] The ESR will consider information received from First Nations on cultural significance, where this information is not identified as confidential.
[6] The ESR will consider iinformation received from First Nations on traditional land use, where this information is not identified as confidential.

3.5.3 Baseline Conditions

The ESR will provide an overview of the baseline conditions within the spatial boundaries of the Project for each SE, including geographical and biophysical features, land use, field surveys and the built environment as relevant to the topic. This will include mapping of municipal roads, parks and other public areas, institutions (e.g., schools and health facilities), and residential, commercial, and industrial areas.

The ESR will describe key findings of existing (or baseline) conditions for each SE in sufficient detail to:

- enable review of the identified potential Project-related interactions; and
- provide more detailed information on field studies, modelling, and analysis.

3.5.4 Project Interactions and Effects Assessment

The ESR will provide details on potential interactions between Project construction and operation activities and SEs, which will be summarized in a matrix for each SE. The ESR will also include a brief description of the mechanism for assessing each identified interaction between a Project activity or physical work and a SE, indicating how each Project-related change could affect the SE.

The proposed Review Indicators for anticipated Project-related effects are summarized by SE in **Table 3-2**. Review Indicators may be refined during the assessment to define potential effects of the Project more accurately.

Table 3-2 Potential Project Effects and Review Indicators

Screening Element	Potential Project-related Change	Review Indicators
Biophysical Environment		
Air Quality and GHG	Potential change during construction and operation emissions from baseline for: • CAC concentrations • GHGs	• Estimated change in emissions of CACs (SO_2, NO_2, CO, PM_{10}, $PM_{2.5}$, VOCs) • Estimated changes in emissions of GHG (CO_2, CH_4, N_2O, reported as CO_2e) • Assessed embodied carbon

Noise and Vibration	Potential change in construction and operation levels compared to baseline for:
	• Noise
	• Vibration
		• Predicted noise levels (in dBA) at sensitive receptors[7] as follows:
		  • Daytime and nighttime equivalent (Ld and Ln)
		  • Hourly equivalent for the worst-case hour (Leq [1 hour])
		  • Day-night (Ldn)
		• Predicted ground vibration levels at sensitive receptors as follows:
		  • Peak particle velocity in mm per second
		  • Root mean square velocity in mm per second

Contaminated Sites	Potential release of contaminants during construction	• Effects of disturbance to contaminated sites during Project construction • Extent and nature of contaminated sites within assessed area
Fisheries and Aquatics	Potential permanent change in fish habitat from baseline Potential changes to water quality from baseline	• Net changes (losses and gains) (m^2) to instream habitat and riparian habitat • Changes in water quality • Changes to fish health, or potential for mortality
Vegetation and Wildlife	Potential change from baseline during construction and operation: • in abundance of species of management concern • in biodiversity • in habitat connectivity • wildlife disturbance or mortality	• Extent of provincially listed ecological communities at risk • Change in availability of wildlife habitat features or character of available habitat • Change to pathways for wildlife movement • Change in spatial extent of forest canopy cover • Change in spatial extent of vegetated elements and potential for changes to connectivity • Change in number and type of trees within the Project alignment, including heritage or protected trees • Potential change to occurrence and locations of invasive species

[7] For the purpose of the ESR, sensitive receptors are defined as locations with potentially heightened sensitivity or exposure. Sensitive receptor locations include residences; institutions, such as schools, daycares, and senior care facilities; places of worship that value tranquility and facilities housing highly sensitive equipment, such as health care facilities.

Screening Element	Potential Project-related Change	Review Indicators
Human Environment		
Archaeology and Heritage	Potential changes to archaeological resources (known and unknown sites) Potential alterations to heritage buildings or other registered sites[8]	• Areas with high archaeological potential that could be affected • Number and description of archaeological sites with potential to be altered • Number and description of heritage sites with potential to be altered
Land Use	Potential change in commercial, recreational and residential land use from baseline, effects to conservation area and consistency with land use policy, and any information shared by First Nations on traditional or cultural use of the lands.	• Alignment with local and regional government land use plans • Area of Project footprint in which land use is changed or limited • Changes in residential, recreational or conservation land use during operation (e.g., due to noise or local visual effects).
Transportation and Access	Potential changes in traffic, transportation, access, public safety, and security from baseline during construction and operation	• Change in parking and access • Change in vehicle volume (vehicles/day, vehicles/km travelled) • Transit (travel time, ridership) • Changes to pedestrian and cycling access • Public access to emergency services (qualitative) • Emergency medical services, fire rescue, and police response (qualitative)
Visual Landscape	Potential change in view conditions from baseline	• Changes to regional and local views due to the Project

Notes:

CAC – criteria air contaminant
CH_4 – methane
CO – carbon monoxide
CO_2 – carbon dioxide
CO_2e – carbon dioxide equivalent
dBA – A-weighted decibel
Ld - daytime equivalent sound level
Ldn – day-night equivalent sound level
Leq – equivalent continuous sound pressure level for a specified period
Ln – nighttime equivalent sound level
m^2 – square metre
mm – millimetre
N_2O – nitrous oxide
NO_2 – nitrogen dioxide
$PM_{2.5}$ – particulate matter 2.5 micrometres or less in diameter
PM_{10} – particulate matter 10 micrometres or less in diameter
SO_2 – sulphur dioxide
VOC – volatile organic compound

[8] Assessment of heritage and archaeology to be carried out in accordance with BC *Heritage Conservation Act*

3.5.5 Mitigation of Potential Effects

To avoid or minimize potential effects on the biophysical and human environment during construction and operations, the ESR will propose Project and site-specific mitigation measures that meet or exceed industry standards. See **Section 3.8** and **Section 3.9** for additional detail on environmental management during construction and operation.

3.5.6 Assessment and Characterization of Potential Effects after Mitigation

For each SE, the ESR will describe the effects that remain following implementation of mitigation measures. Characteristics of potential effects such as context, magnitude, geographical extent, duration, reversibility, and frequency will be used to describe and characterize the effects. Where effects cannot be characterized quantitatively, they will be described qualitatively.

3.6 Accidents and Malfunctions

This section will include a risk-based approach for assessing unplanned events that could arise from malfunctions or accidents associated with Project activities that could affect the SEs or how the environment could affect the Project. A malfunction is considered a failure of a device, piece of equipment, or a system to function as intended, while an accident is an unexpected occurrence or unintended action.

The Accidents and Malfunctions section will include:

- Identification of potential accident and malfunction scenarios during Project construction and operation, such as:
  - Fire on gondola or auxiliary facilities
  - Fuel leak or spill
  - Electrical or other utility disruptions
  - Vandalism
  - Structural failure of infrastructure
  - Gondola cable jam or break
- The methodology for assessing the potential risk of an event (likelihood and consequence)
- Identification of proposed measures to reduce the likelihood of the event; and
- Conclusions on the potential risk of the accident or malfunction to relevant SEs.

The ESR will also consider the effects of the environment on the Project that could cause an accident including:

- Identification of possible environmental factors that could affect the Project such as:
  - Extreme weather events such as windstorms, heavy rain, ice or snow
  - Natural hazards such as geotechnical or seismic events, fires and floods
- A description of any changes or effects on the Project due to environmental factors; and
- The likelihood and consequence of the changes or effects to relevant screening elements.

Contingency measures will include practical mitigation measures to avoid or minimize:

- Anthropogenic or mechanical accidents or malfunctions; and
- Consequences of the environment on the Project.

3.7 Summary and Conclusion

The ESR will present key findings of the environmental screening and describe how these findings will be used to avoid or minimize potential effects as well as any next steps for First Nations, public, and stakeholder engagement.

3.8 Environmental Management During Construction

Mitigation identified in the ESR will form the basis of a Construction Environmental Management Plan (CEMP) Framework, which will be linked to the contractual requirements for the Project's environmental management and form the basis of the contractor's CEMP. The CEMP Framework will summarize the following in a table format: Project activity or physical work; potential effects linked to that activity; and associated mitigation. The CEMP Framework will describe performance objectives, associated best practices intended to meet those performance objectives, and required content for each sub-plan. The CEMP Framework will also include details on Project roles and responsibilities for the team's key members during construction. The CEMP Framework will include the following:

- Proposed mitigation, best practices, and guidance;
- Requirements to manage the effectiveness of monitoring; and
- Key performance measures to evaluate effectiveness of mitigation.

Proposed sub-plans to be included in the CEMP Framework are as follows:

- Environmental Awareness and Training Plan;
- Environmental Monitoring Plan;
- Air Quality and Dust Control Management Plan;
- Noise and Vibration Management Plan;
- Contaminated Soil and Water Management Plan;
- Erosion and Sediment Control Plan;
- Fish and Fish Habitat Management Plan;
- Vegetation and Wildlife Management Plan, including invasive species management;
- Archaeological and Heritage Management Plan;
- Spill and Emergency Response Plan;
- Construction Waste Management Plan; and
- Site Restoration Plan.

The CEMP Framework will also require that each CEMP sub-plan describe the legislation applicable and include a list of applicable licences, permits and approvals that may be required during construction and relevant to the work. Each sub-plan will also reference other associated plans and consultation programs relevant to environmental management during construction. Traffic and access management will be addressed separately, rather than as part of the CEMP.

3.9 Environmental Guidance During Operation

Environment guidance for the Project during operation will be integrated and consistent with TransLink standard operating procedures for environmental management. Additional procedures will be developed for unique aspects of BMG, including ropeway and tower maintenance. The following elements are likely to require ongoing management during Project operation.

3.9.1 Noise

Noise due to Project operation will be managed in accordance with current TransLink practices as well as practices that will be developed that are unique to BMG, based on best practices from other jurisdictions. Assessment, engagement, and consultation may indicate site-specific requirements for noise monitoring or attenuation measures.

3.9.2 Vegetation

Mitigation measures may require post-construction effectiveness monitoring for vegetation management and site restoration plantings. Adaptive management practices will be key in addressing measures that either do not function as intended or designed or vegetation that may interfere with BMG operation.