Burnaby Mountain Gondola

Route Selection Report

March 1, 2021

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Executive Summary

TransLink undertook planning work for a gondola on Burnaby Mountain — a proposed transit option that would provide fast, frequent, and reliable service between the SkyTrain and Burnaby Mountain. It would improve customer experience by replacing overcrowded buses, improving unpredictable wait times and increasing daily and seasonal reliability of travel. Finally, it will support more drivers switching to transit reducing congestion, GHG emissions, and accidents.

Pre-pandemic, there were over 25,000 daily transit trips to and from Burnaby Mountain by SFU students, staff, faculty, and residents of UniverCity. In-person classes are expected to resume once a vaccine has been administered widely with demand for transit returning to pre-pandemic levels over time. During peak hours, existing bus service is at capacity and TransLink customers are frequently passed up by full buses, changing a 15-minute bus trip into a 30-minute trip from SkyTrain to Burnaby Mountain. Delays are worse in inclement weather when buses are known to stall in ice and snow.

The growing student, staff, and residential populations on Burnaby Mountain will result in increased pressure on the current transit system that additional buses cannot solve. The 145 bus currently operates every 5 minutes in peak periods, moving about 1,000 passengers per hour. The fastest the buses could operate is every 2.5 minutes, moving about 2,000 passengers per hour. (This is about the amount of time it takes for passengers to unload and load.)

TransLink's ridership modelling suggests that by 2035, approximately 3,100 passengers per hour per direction (pphpd) would travel on the gondola.

The operating cost of the proposed gondola is an estimated 30% lower than bus service, which would enable TransLink to reinvest the savings elsewhere in the regional transit network. The capital cost is an estimated $210 million, comparable with estimates developed in previous studies.

Over the course of 2020, TransLink and its partners conducted a planning program with the objective of narrowing three potential routes that would connect the SkyTrain to Burnaby Mountain to a single, preferred route. Routes 1 and 2 would start at Production Way–University Station and Route 3 from Lake City Way Station. Route 1 is a straight route. Routes 2 and 3 each have angle stations mid-route to allow them to change directions. Given this additional infrastructure requirement and the location of the study area (a large portion of the routes would run over the Burnaby Mountain Conservation Area), the angle routes faired poorer in the route evaluation.

The evaluation process revealed that the angle station routes (Routes 2 and 3) would have:

- decreased travel time savings and lower mode shift thereby reducing expected GHG emissions;
- increased capital, operating, and maintenance costs;
- increased visual presence (Route 2);

- increased environmental impacts (land and water based; tree loss; critical habitat);
- increased potential for Indigenous archaeological and cultural resource impacts;
- increased constraints due to potential safety hazards (Route 2: proximity to high voltage power lines and Route 3: proximity to the Burnaby Mountain storage facility [tank farm]); and
- decreased geotechnical stability.

Routes 2 and 3 would pass near residential neighbourhoods and there would be a visual presence of the gondola. Noise modelling indicated that the gondola would not result in a perceptible increase in background noise levels in residential neighbourhoods.

TransLink conducted two phases of public engagement — in September 2020 and November/December 2020. A summary of the feedback we received is included in Appendix 1 of this report. Support for the Burnaby Mountain Gondola project was high in both phases of engagement, 84% and 83% respectively. Feedback from the first phase of engagement helped to inform the values and evaluation of the potential gondola routes (see Appendix 2: Phase One Engagement Summary Report). The second phase of engagement shared the results of the analysis and asked survey participants to indicate their level of support for the three routes (see Appendix 4: *Preliminary Route Evaluation Report*). Across all municipalities and age demographics, there was strong support for Route 1 (85%) compared to Route 2 (19%) and Route 3 (12%).

	Route 1 Support	Route 2 Support	Route 3 Support
All responses	85%	19%	12%
Metro Vancouver *(not including Burnaby)*	90%	18%	11%
Burnaby	74%	20%	15%
Burnaby *(non-SFU and non-Forest Grove)**	83%	16%	11%
Burnaby *(SFU)***	90%	20%	16%
Forest Grove	30%	23%	21%
UniverCity	89%	25%	13%

** Excludes Burnaby residents who study or work at Simon Fraser University's Burnaby campus or at a workplace within UniverCity, as well as residents living in the UniverCity or Forest Grove communities.*

***Includes all respondents who self-identify as affiliated with Simon Fraser University, except for residents of UniverCity.*

Route 1 garnered the most public support across all aggregations (including the Forest Grove neighbourhood). Route 1 offers the greatest benefits, lowest costs, and lowest implementation considerations (see Appendix 4: *Preliminary Route Evaluation Report*).

The results of the engagement and technical evaluation are conclusive — **Route 1 is the preferred and recommended route for a Burnaby Mountain Gondola.**

However, Route 1 does pass over the Forest Grove community. This community has expressed concern about potential impacts of the gondola and how it may impact privacy, property values, visual presence, and noise.

Should the project advance, TransLink has identified commitments to help minimize these possible effects, including assessing the use of tinting glass to turn windows opaque above the Forest Grove neighbourhood, undertaking additional noise monitoring to understand if in-cabin noise is audible to the Forest Grove neighbourhood, refining the design to minimize visual impact, and fairly compensating residents directly impacted by the gondola.

Route 1.

Introduction

The Burnaby Mountain Gondola Route Selection Report will:

- Provide an overview of the gondola planning program;
- Outline the development of the routes and evaluation processes;
- Summarize feedback from public and Indigenous engagement;
- Recommend a preferred route; and
- Identify mitigations and areas of analysis for further exploration.

Burnaby Mountain Gondola Planning Program

In 2020, TransLink embarked on the Burnaby Mountain Gondola planning program ("planning program"). The objective of the planning program was to develop conceptual designs for three proposed routes, engage the public, stakeholders and Indigenous Nations, and review opportunities for project funding.

The planning program included technical and engagement elements:

Technical program

- Technical analysis
- Conceptual route design
- Route evaluation

Engagement program

- Public
  - Pre-engagement activities
  - Phase One: understand values and review criteria
  - Phase Two: share evaluation and gauge support for routes
- Indigenous engagement

From the outset, the planning program was guided by the City of Burnaby's 2019 Core Principles:

Residents: Minimize impact to residents living near the gondola.

Environment: Minimize impact to areas with high ecological values, such as fish-bearing streams and riparian areas.

Compensation: Provide fair compensation to affected property owners for intrusion of the gondola, both for its physical footprint on their lands and its aerial passage over them.

Options: All three options should be considered on an equal basis in the next stage of analysis and public consultation.

Consultation: Engage the community in meaningful consultation, especially with respect to alignment options, and report back to Council on the results. Option 3 should be considered with and without the extension of Expo Line operations to Lake City Way Station.

The planning program built on TransLink's previous technical work on the Burnaby Mountain Gondola, which found that:

- There is merit in replacing diesel bus service to Burnaby Mountain with an aerial passenger ropeway (or aerial gondola) as a cost-effective means to improve travel time, service frequency, and reliability, and to reduce GHG emissions (*BMGT Technology and Alignment Alternatives Assessment* [TransLink, 2011a; 2011b]).
- The 3S gondola is the preferred technology and Route 1 is the preferred route option (*BMGT Technology and Alignment Alternatives Assessment* [TransLink, 2011a; 2011b]).
- Current and future ridership growth necessitates a faster, more frequent, and more reliable connection between the SkyTrain network and Burnaby Mountain. (*Burnaby Mountain Gondola – Transit Feasibility Study, 2018*).
- The gondola would provide significant consumer benefits in travel time savings, vehicle operating costs, collision reductions, parking costs, and vehicle emissions (*Burnaby Mountain Gondola – Transit Feasibility Study, 2018*).

Decision Making

As the planning program advanced, the project team engaged its partners through regular meetings, including with staff and senior leadership from:

- City of Burnaby
- Simon Fraser University
- Ministry of Transportation and Infrastructure
- Ministry of Municipal Affairs and Housing

The project team also provided briefings to Burnaby Mayor and Council throughout the planning program.

Finally, the project team held regular meetings with Minister Katrina Chen, MLA for Burnaby Lougheed, who represents residents of both the Forest Grove and UniverCity communities.

Next steps include:

- Burnaby City Council to receive and consider a staff report on the project;
- Present findings of planning program to TransLink's Mayors' Council; and
- Mayors' Council to determine if the Burnaby Mountain Gondola is a funding priority to be included in a future Investment Plan.

Planning Program Assumptions

CHANGES TO THE CURRENT BUS NETWORK

Simon Fraser University's Burnaby Campus generates significant demand for transit and is served by four routes: the R5 Rapid Bus, 143, 144, and 145. To estimate potential operating cost savings from the project, it is assumed that the Route 145, which operates between Production Way–University and SFU, and Route 143, which operates between Burquitlam and SFU, would be cancelled. No service changes are currently proposed for the R5 or 144. A decision to implement these changes has not been made, and any changes would be planned and confirmed in tandem with a decision to implement the proposed gondola project.

The Forest Grove community is served by Route 136. This route serves destinations between Lougheed Station and Brentwood Station, including Production Way–University SkyTrain station. Route 136 travels along Forest Grove Drive and Production Way, connecting residents to the SkyTrain station and to SFU (via Route 145). No service changes are currently proposed for Route 136.

Planning for bus service changes would consider maintaining local access to service and balancing capacity supplied with demand, among other factors.

TRANSLINK'S FLEET ELECTRIFICATION AND GHG EMISSION REDUCTIONS

Transportation accounts for over 35% of all GHG emissions in Metro Vancouver. As one of the region's largest consumers of diesel fuel and operator of a fleet of heavy-duty vehicles, TransLink plays an important role in reducing emissions in our own operations. TransLink is implementing a Low Carbon Fleet Strategy to meet environmental targets, including:

- Reducing GHG emissions from operations by 80% by 2050;
- Using only renewable energy in all operations by 2050.

Significant fleet electrification is necessary to achieve a reduction of TransLink's GHG emissions. The 145 and 143 bus routes described above currently operate with diesel-hybrid and compressed natural gas buses, which emit nearly 3,700 tonnes of CO_2e annually.

While these services are likely to be electrified in the future, the Low Carbon Fleet Strategy is currently only partially funded. Further, the electrification of the current routes serving SFU does not address the current and future capacity constraints. A gondola can effectively move more people per hour than bus (3,000 vs. 2,000). Therefore, a gondola would address the capacity constraints while accelerating the transition to a 100% net-zero fleet, achieving emissions targets. The avoided costs of electric charging infrastructure and battery bus purchase could be used to electrify services elsewhere on the network.

Further GHG reductions are estimated to result from those who switch from driving to transit because of the gondola. Estimates range from 800 to 1,400 tonnes CO_2e annually, depending on the gondola route. Together, the annual reduction of CO_2e from bus and auto reductions may equal 5,100 tonnes.

PROGRAM PLANNING DURING THE COVID-19 PANDEMIC

The COVID-19 pandemic fundamentally changed the nature of work and school, with a shift from offices and classrooms to working and learning at home.

From the project perspective, the COVID-19 pandemic resulted in a shift from in-person meetings and events to online or virtual events. This changed how we engaged with our project partners, stakeholders, the public, and Indigenous Nations. Historically, TransLink's public engagement has been a mix of online and in-person engagement opportunities. The Burnaby Mountain Gondola was the first project that TransLink conducted 100% virtually, with no in-person events. Participation rates in both phases of public engagement exceeded targets, including what we would typically expect for a project at this stage.

In mid-March 2020, SFU classes moved from in-person to online instruction, with a small return over the summer months of research personnel working in labs. The remainder of the student body continued with online courses throughout the summer, fall, and winter semesters. During this time, demand for transit services to and from SFU dropped dramatically, leading TransLink to scale back services to SFU and across our network.

Enrollment of students for the 2020/2021 academic year was consistent with previous years. The return to in-person classes is contingent upon the vaccine rollout and whether herd immunity can be achieved by September 2021. Otherwise, in-person classes are expected to resume in January 2022. Throughout this pandemic, questions have arisen about whether there will be a long-term shift to online learning and what this may mean for current and future transit demand. According to SFU, students have indicated a strong preference to return to campus for in-person classes and the social and intellectual life a campus offers outside of the classroom. SFU anticipates a return to pre-pandemic attendance levels once it is safe. TransLink anticipates a corresponding increase in demand for transit.

Route Summary

The potential gondola routes that were conceptually designed and evaluated are described and illustrated on the map that follows.

Route 1 is a straight route from Production Way–University SkyTrain Station to SFU Burnaby campus, with the gondola terminal located near the bus exchange. The route length is 2.7 km and the estimated travel time is 6 minutes (Note: current average bus travel time is 15 minutes).

Route 2 is the eastern route from Production Way–University SkyTrain Station with the gondola traveling along Gaglardi Way, changing direction at a non-boarding angle station, and continuing to SFU Burnaby campus with the terminal near the bus exchange. The route length is 3.7 km and estimated travel time is 11 minutes.

Route 3 is the western route from Lake City Way SkyTrain Station to SFU Burnaby campus, which would cross the Burnaby Mountain Golf Course, changing direction at a non-boarding angle station, and continuing to SFU Burnaby Campus with the terminal located south of South Campus Road. The route length is 3.6 km and estimated travel time is 10 minutes.

Proposed gondola routes.

Planning Rationale

TransLink undertook planning work for a gondola on Burnaby Mountain — a proposed transit option that would provide fast, frequent, and reliable service between the SkyTrain and Burnaby Mountain. Capital and operating costs were updated and are comparable to the most recent previous study, an estimated $210 million.

Pre-pandemic, there were over 25,000 daily transit trips to and from Burnaby Mountain by SFU students, staff, faculty, and residents of UniverCity. (In-person classes are expected to resume once a vaccine has been administered widely with demand for transit returning to pre-pandemic levels over time.) During peak hours, existing bus service is at capacity and TransLink customers are frequently passed up by full buses, changing a 15-minute bus trip into a 30-minute trip from SkyTrain to Burnaby Mountain. Delays are worse in inclement weather when buses are known to stall in ice and snow.

The growing student, staff, and residential populations on Burnaby Mountain will result in increased pressure on the current transit system that additional buses cannot solve. The 145 bus currently operates every 5 minutes in peak periods, moving about 1,200 passengers per hour. The fastest the buses could operate is every 2.5 minutes, moving about 2,000 passengers per hour. (This is about the amount of time it takes for passengers to unload and load.) TransLink's ridership modelling suggests that by 2035, approximately 3,100 passengers per hour per direction (pphpd) would travel on the gondola.

Project Benefits

The project benefits have been well-documented both in previous planning studies as well as the current planning program. They include:

- Immediate transition to a 100% net-zero transit fleet;
    - Over the 30-year project life gondola may offset 79,000 tonnes CO_2e from mode shift and replacing diesel buses (assuming 10 years of operation before conversion to battery electric buses).
- Improved transit travel time;
    - Gondola could reduce total transit travel time by up to 13%. This means that trips to/from SFU from anywhere on the network will be faster.
- Better serve pre-pandemic, anticipated post-pandemic and future transit ridership growth;
- Increase in sustainable mode share;
    - Drivers will switch to transit when transit travel times become more competitive and transit service becomes more frequent and reliable. Vehicle Kilometer Travelled (VKT) is a critical measurement that can identify the system-wide impact of a transportation project. With the implementation of the gondola, there are anticipated savings of 29 million VKT.
- Reduction in local vehicle traffic and congestion;
    - As more drivers switch to gondola, there could be a reduction in daily auto congestion of 490-700 hours.
- Improved daily and seasonal transit service reliability by increasing capacity, frequency, and all-weather durability;
    - Cabins would depart approximately every minute during peak periods, moving more people per hour than buses and more reliably. (Gondola: 3,000 and bus: 2,000)
    - Gondola systems can operate in high winds (up to 100 km/hr) and operate more reliably in winter conditions than buses.
- Elimination of bus-related noise, GHG emissions, and local air pollution from the local environment;
- Additional route to travel off Burnaby Mountain in the event of safety incident;
- Regional serving project that will extend the rapid transit network, connecting Burnaby Mountain to the rest of the region; and
- Approximately 30% lower operating cost than bus, so savings can be reinvested in TransLink's network.

How the Routes Were Developed

A core directive of the planning program was to further develop the three potential gondola routes. Previous work in the 2018 Burnaby Mountain Feasibility Study was updated and Route 3 was added at the request of the City of Burnaby. The potential gondola routes were developed to a conceptual level of design that followed a principles-based approach and incorporated underlying local conditions.

The design principles were informed by the Core Principles set out by the City of Burnaby:

- Minimize impacts to residents.
- Minimize impact to the environment.
- Minimize utility and safety conflicts.

Application of the Design Principles

TransLink worked with a ropeway supplier (designer of aerial transit systems) to develop conceptual route designs for the potential gondola routes. TransLink's direction to the ropeway supplier was to minimize the overall impact of the gondola system.

Residential

- Minimize property impacts by limiting the number of residential properties crossed;
- Minimize privacy impacts by separating the gondola from residences; and
- Minimize impacts from noise and visual presence by locating towers as far as possible from residential areas.

Environmental

- Locate towers in developed areas or within road right-of-ways;
- Limit the number of towers in the Burnaby Mountain Conservation Area;
- Minimize tree loss and habitat disruption; and
- Avoid watercourses and watercourse setbacks.

Utility and safety conflicts

- Avoid placing towers or angle stations on or near utility right-of-ways.

In addition to the design principles, TransLink provided technical analysis to the ropeway supplier. This information provided context of the local underlying conditions and operational components of the gondola including: a desktop environmental scan to understand environmental, geotechnical, and land use constraints; and review of utilities infrastructure.

How the Routes Were Evaluated

After completing a conceptual design of the proposed gondola route, TransLink evaluated the routes. This included confirming the evaluation criteria, conducting technical analysis, and, finally, comparing the three routes.

Confirmation of Evaluation Criteria

The route evaluation was informed by the City of Burnaby's Core Principles, feedback from Phase One public engagement and Indigenous engagement, and technical analysis.

Feedback from the Phase One engagement process confirmed that appropriate criteria was used to assess the trade-offs between the routes. Indigenous Nations expressed an interest to include criteria to measure the impacts to Indigenous heritage resources, including archaeological resources as well as current and traditional cultural uses located along the route alignments.

The three potential routes were evaluated against three different groupings of analysis:

- **Benefits:** It is expected that the project could provide benefits to transportation users by improving trips to and from Burnaby Mountain, reducing congestion, supporting a travel mode switch from vehicle to transit, and reducing GHG emissions.
- **Financial considerations:** Financial considerations include capital, operating and maintenance costs of the proposed gondola system; and
- **Implementation considerations:** There would be trade-offs to implementing a gondola system. The three routes all have varying levels of trade-offs as they relate to neighbourhood, environment and safety considerations.

The intention of the framing was to enable comparisons between the routes in terms of potential benefits, costs, and trade-offs.

Once the evaluation structure and criteria were confirmed, a review and assessment of supportive technical analysis helped to inform the evaluation.

Project benefits	**Transportation user experience**	Maximize transit capacity (passengers per hour per direction)
		Reduce transit travel times and estimated walking time to central SFU (travel time in minutes)
		Top terminal walking access to SFU buildings (% of academic or other buildings within a 5-minute walk)
		Maximize reduction in auto congestion (hrs/day)
	Sustainable transportation	Maximize boardings / year (millions)
		Maximize reduction in GHG emissions (auto in tons CO_2)
Financial consideration	**Fiscal stewardship**	Minimize net capital cost (millions)
		Minimize net annual operating and maintenance cost (millions)
Implementation consideration	**Neighbourhood**	Minimize noise impacts from towers and terminals (decibels of perceptible change in neighbourhoods attributed to gondola)
		Minimize privacy considerations, gondola customers viewing properties (number of existing parcels and area within privacy impact zone measured by linear distance)
		Minimize visual presence in neighbourhoods, residents seeing gondola (number of properties in visual presence zone)
		Minimize property impacts from infrastructure and aerial crossing (number and area of properties within 20m right of way and in m^2)
	Environment	Lowest impacts to Burnaby Mountain Conservation Area and parkland (overlapping land with parks and conservation areas in m^2)
		Minimize land disturbance in Burnaby Mountain Conservation Area to avoid archaeological disturbance and minimize impacts to Indigenous cultural resources (m^2)
		Minimize impacts to forested areas (approximate tree loss)
		Minimize impacts to watercourses and riparian areas and setbacks (riparian clearing in Class A and B watercourses in m^2)
		Minimize impact to critical habitat for Western Painted Turtle (crucial habitat in m^2)
	Utilities and safety	Maximize geotechnical site stability for tower and terminal locations (descriptive rating)
		Minimize significance of utilities conflicts
		Minimize risk to system from external safety hazard

Gondola route evaluation criteria.

Technical Analysis

Technical analysis was conducted to support the *Preliminary Route Evaluation Report* and the findings can be found in the *Preliminary Route Evaluation Report*. The purpose of this section is to describe the methodology that was used to undertake the technical analysis that helped to inform the evaluation of the three routes.

TRANSPORTATION

TransLink conducted a ridership forecasting analysis to better understand near-term and long-term transportation demand. Updates to the land-use projections and the future transportation network were incorporated into the Regional Transportation Model (RTM). Two "horizon years" were modelled to estimate the project benefits: 2035 and 2050. For each horizon year, four scenarios were run: business as usual, Route 1, Route 2, and Route 3. The modelling provided outputs on the expected travel time savings for transit users, reduction in congestion for road users, anticipated boardings, and GHG emissions reductions from auto and bus.

COSTS

Cost estimates are generally consistent between the Burnaby Mountain Gondola Transit – Feasibility Study ($197 M [2018]) and this planning program ($210 M [2020]). The ropeway supplier provided the estimated capital, operating, rehabilitation, and maintenance costs. TransLink's Real Estate division updated anticipated property costs.

ENVIRONMENT

A desktop review was conducted to assess the potential land, watercourse and riparian areas, critical habitat, and tree removal.

INDIGENOUS HERITAGE

An Archaeological Overview Assessment (AOA) was conducted to evaluate if there were any documented archaeological sites along the proposed routes.
This desktop study was supplemented with preliminary field reconnaissance of the proposed gondola routes in which members from the four affected Indigenous Nations participated: kʷikʷəƛ̓əm (**Kwikwetlem**), xʷməθkʷəy̓əm (**Musqueam**), Sḵwx̱wú7mesh Úxwumixw (**Squamish**), səlilwətaɬ (**Tsleil-Waututh**) . They provided valuable information about current and historical cultural uses along the proposed routes. This was completed after the writing of the *Preliminary Route Evaluation Report*. Land disturbance was used as a proxy measure in the *Preliminary Route Evaluation Report*.

NEIGHBOURHOOD

Residents of the Forest Grove community expressed interest in understanding if a gondola would increase noise levels within the community. Noise monitoring was conducted at Forest Grove Elementary School to establish baseline noise levels. This location was selected given its proximity to the Route 1 alignment that passes approximately 100 m to the east of the school. Noise modelling was conducted to assess potential changes in background noise levels from the gondola and was conducted for towers and angle stations located near the residential areas of Forest Grove, Rathburn, and Meadowood.

Residents also identified the potential for property value impacts. Minimizing the number of residential properties and residential units over which the gondola would cross was a priority in the conceptual design process. Property impacts were determined by the conceptual route alignment, parcel data, and location of units within the residential buildings. Route 1 is the only route with residential property impacts – the gondola right-of-way would extend over two multi-family properties.

Privacy was noted as a concern for residents of Forest Grove. Artistic renderings and photo montages were developed to illustrate the potential distance between the residential buildings and the gondola.

Residents in Forest Grove posed questions about the visibility of the gondola within their community. Accordingly, visual presence was measured by applying a 100 m buffer from the gondola right of way. The ability to view the gondola would be more prominent in this buffer than other areas in the City of Burnaby; however, local topography and tree cover may provide screening of the gondola from residential properties. The gondola cabins would be more prominent when they passed over roads or through open spaces on private property, as they would not benefit from tree cover.

Route Evaluation

The evaluation of the potential routes is contained within the *Preliminary Route Evaluation Report*. This report includes the detailed findings and technical analysis of the benefits, financial, and implementation considerations.

Between the completion of the *Preliminary Route Evaluation Report* and this report, additional analysis included the completion of the AOA report. Based on preliminary mapping results, desktop study and preliminary field reconnaissance and the route concepts provided by TransLink, the routes were ranked as follows:

- Route 1: This route has the least predicted ground disturbance of the options and is rated 'Good'.
- Route 3: This route has five potential structure interactions (structure footprints with high archaeological potential) and will require development of access for construction and maintenance of a tower. Therefore, this route is rated as 'Fair'.
- Route 2: Seven of this route's structures overlap with areas requiring further archaeological investigation. Therefore, Route 2 is rated 'Poor'.

The results of the AOA Report align with the proxy measure (land disturbance) that was utilized in the *Preliminary Route Evaluation Report*.

What We Heard

Overview of Public Engagement

In 2020, TransLink conducted two phases of public and stakeholder engagement as part of the planning and project development of a gondola on Burnaby Mountain. Phase One of stakeholder and public engagement took place between Tuesday, September 1 and Wednesday, September 30, 2020. Phase Two took place between Monday, November 23 and Monday, December 14, 2020.

In each phase of consultation, there were opportunities for participants to complete an online survey and attend a virtual open house to view a presentation and ask questions. In addition, small group meetings were held in each phase to hear directly from Forest Grove residents, and local and regional stakeholders.

Throughout both phases of engagement, participants indicated a high level of support for a gondola connecting SkyTrain to Burnaby Mountain. Support for a gondola remained consistent during both engagement phases. In Phase One, out of 12,955 survey respondents, 84% supported or strongly supported a gondola to Burnaby Mountain. In Phase Two, out of 7,288 survey respondents, 83% supported or strongly supported a gondola to Burnaby Mountain.

Opposition to the gondola also remained relatively consistent between engagement phases. In Phase One, 8% of respondents were opposed or strongly opposed to a gondola to Burnaby Mountain. In Phase Two, 10% of respondents were opposed or strongly opposed. In both phases of engagement, respondents from Forest Grove expressed concern and opposition to the localized impacts of the gondola.

Support levels also remained consistent between Phase One and Phase Two results across age ranges and within local areas of Metro Vancouver. Overall, City of Burnaby residents were consistent in their support. Burnaby neighbourhoods Forest Grove and UniverCity had consistent results with Phase One, with Forest Grove residents mainly opposed and UniverCity residents strongly supportive.

	Route 1 Support	Route 2 Support	Route 3 Support
All responses	85%	19%	12%
Metro Vancouver *(not including Burnaby)*	90%	18%	11%
Burnaby	74%	20%	15%
Burnaby *(non-SFU and non-Forest Grove)**	83%	16%	11%
Burnaby *(SFU)***	90%	20%	16%
Forest Grove	30%	23%	21%
UniverCity	89%	25%	13%

	Route 1 Opposition	Route 2 Opposition	Route 3 Opposition
All responses	10%	39%	56%
Metro Vancouver *(not including Burnaby)*	5%	37%	56%
Burnaby	20%	43%	54%
Burnaby *(non-SFU and non-Forest Grove)**	11%	45%	59%
Burnaby *(SFU)***	6%	37%	50%
Forest Grove	63%	47%	50%
UniverCity	8%	37%	52%

** Excludes Burnaby residents who study or work at Simon Fraser University's Burnaby campus or at a workplace within UniverCity, as well as residents living in the UniverCity or Forest Grove communities.*

***Includes all respondents who self-identify as affiliated with Simon Fraser University, except for residents of UniverCity.*

Participation rates also remained consistent during both engagement phases, with the proportionate number of participants who are Burnaby residents remaining consistent throughout the process. In Phase One, 35% of all respondents reported living in Burnaby. In Phase Two, 32% of all respondents reported living in Burnaby.

Phase One Overview

Throughout Phase One, TransLink shared information about the project, including background information, route options, potential impacts, and next steps. TransLink sought feedback on the criteria identified to evaluate three route options.

In total, TransLink facilitated 13,173 public and stakeholder interactions in Phase 1, including 12,955 survey responses and 189 participants in a virtual open house, telephone townhall, general stakeholder meeting, and two Forest Grove community workshops.

Through Phase One of the engagement process, there was broad support for the project and proposed route evaluation criteria, with 84% of survey respondents indicating they were very supportive or supportive of the project. On a scale of 0 to 5, the average level of support from survey participants was 4.35.

When assessing the proposed route evaluation criteria, safety and security were top considerations for survey respondents and engagement session participants.

Another clear theme was the need for a solution that would work in winter conditions and provide reliable, consistent service to all transit users. Respondents also indicated strong support for seamless connections to existing SkyTrain and bus systems.

Through the first phase of engagement, different neighbourhoods expressed different priorities. Forest Grove residents focused on localized issues, including noise, visual, privacy, and safety impacts. UniverCity residents felt most strongly about providing a safe and secure service at the Burnaby Mountain terminus station and improving all-weather and daily travel reliability.

This critical feedback helped to inform TransLink's route evaluation criteria. The results of the route evaluation were presented to the public for comment in Phase Two of the engagement process.

TransLink released the Phase One Stakeholder and Public Engagement Summary Report after the engagement period concluded.

Phase Two Overview

Throughout Phase Two, TransLink shared a summary of the route options and project background, Phase One engagement results, and the route evaluation. TransLink sought feedback on the level of support for a Burnaby Mountain Gondola, and levels of support for the three potential gondola route options.

In total, TransLink facilitated 7,492 public and stakeholder interactions, including 7,292 completed surveys, and 156 participants in two virtual open houses, a general stakeholder meeting, and two community workshops.

Support remained consistent in Phase Two of the engagement process with 83% of survey respondents indicating they were very supportive or supportive of the project. On a scale of 0 to 5, the average level of support from survey participants was 4.23.

A majority of respondents from Burnaby, across Metro Vancouver, and across all age demographics, identified Route 1 as their preferred route. In total, 85% of respondents supported or strongly supported Route 1, compared to 19% for Route 2, and 12% for Route 3.

On a scale of 0-5, the average support level for Route 1 was 4.34, compared to scores of 2.02 and 1.49 for Routes 2 and 3, respectively.

Among those opposed to a gondola on Burnaby Mountain, the most common responses expressed skepticism about the viability of the project's business case, including cost of building and operating the gondola, ridership projections, and COVID-19's impacts on the project's viability and project funding. Several respondents also expressed concern about the environmental impacts to the Burnaby Mountain Conservation Area and emphasized the importance of choosing a route that minimizes impacts on wildlife habitat, tree loss, bird migration patterns, and air quality.

While a majority (51%) of Forest Grove respondents oppose the gondola project, of those that expressed a route preference, more supported Route 1 (30%), compared to Route 2 (23%), and Route 3 (21%).

When asked to elaborate, survey respondents as well as engagement session participants expressed support for Route 1 because it is the most direct route and the most cost-effective. While transportation efficiency was among the highest justifications for support, some respondents also cited reduced environmental impacts in comparison to other routes.

Opponents to Route 1 expressed concerns about noise, visual, and privacy impacts for residents in Forest Grove, as well as the potential impact on property values for homes near the gondola. Forest Grove residents are overrepresented among opponents to Route 1, making up 38% of those opposed or strongly opposed but only 6% of overall responses.

At the same time, 39% of respondents opposed or strongly opposed Route 2, while a majority of respondents (56%) opposed or strongly opposed Route 3. Levels of opposition to Route 2 and Route 3 remained relatively consistent among age demographics and across different Metro Vancouver neighbourhoods.

When asked to elaborate, survey respondents and engagement session participants highlighted general concerns regarding the viability of the two routes, specifically, reduced time savings, higher costs, and greater environmental impacts.

In addition, several respondents expressed safety concerns regarding Route 3's proximity to Trans Mountain's Burnaby storage terminal. Some respondents also expressed concerns regarding the need for westbound travellers to transfer from the Expo Line to the Millennium Line in order to access Route 3.

TransLink released the Phase Two Stakeholder and Public Engagement Summary Report after the engagement period concluded.

Engagement with Local Communities

On the first day of both phases of engagement, postcards were delivered to each of the approximately 1,500 homes in the Forest Grove, Meadowood Park, and Rathburn communities. In UniverCity, residents were informed by posters in buildings and via an email distribution list.

In addition, TransLink sent email notifications to 64 Forest Grove residents who signed up for project updates. The emails provided information about upcoming meetings and other engagement opportunities.

Postcard notification area for Forest Grove, Meadowood Park and Rathburn neighbourhoods.

TransLink also ran ads on Facebook, Twitter, Google, and the Burnaby Now website, as well as in the Burnaby Now print edition, to raise awareness about both phases of engagement.

Throughout the engagement process, TransLink held four community workshops with Forest Grove residents, engaging a total of 86 participants (of which 71 were unique attendees). At these workshops, TransLink addressed specific implementation considerations for local neighbourhoods, including privacy impacts, visual presence, property impacts, noise, and safety. These sessions often ran beyond the 60-minute time allocation in order to answer as many questions as possible from residents.

Several Forest Grove residents also made use of TransLink's dedicated project email (translink@gondola.ca) and phone number to ask additional questions and provide further comments.

All questions and comments were recorded and helped to inform both the Phase One and Phase Two engagement summary reports. TransLink made note of localized neighbourhood concerns in the executive summaries of both reports, as well as throughout the documents.

Overview of Indigenous Engagement

The proposed Burnaby Mountain Gondola project lies within the unceded, traditional territories of the Coast Salish peoples. During the Burnaby Mountain Gondola planning program, TransLink engaged potentially affected Indigenous Nations, in particular, the kʷikʷəƛ̓əm **(Kwikwetlem),** xʷməθkʷəy̓əm **(Musqueam),** Sḵwx̱wú7mesh Úxwumixw **(Squamish),** səlilwətaɬ **(Tsleil-Waututh) Nations to understand their rights and interests in the project area and obtain their input on the evaluation of route options.**

Through engagement, Indigenous Nations affirmed the ongoing high cultural significance of Burnaby Mountain. Traditional harvesting and cultural use, including traditional sacred sites and historic trails, have been documented in the project area or vicinity.

Interests and priorities identified by Indigenous Nations during engagement related primarily to the protection and enhancement of cultural, archaeological and environmental values, the cumulative effects of development, and climate change.

Indigenous Nations participated in a preliminary field reconnaissance to identify potential archaeological values in the project area. Of those Indigenous Nations that identified a preferred route, Route 1 was identified as the preferred option. Reasons included the facts that Route 1 provides the greatest GHG reduction benefits and the lowest environmental and land disturbance impacts, including requiring no access roads and fewer structures. TransLink has incorporated this feedback into the evaluation of route options.

TransLink is committed to ongoing engagement and participation of Indigenous Nations as the project proceeds, including minimizing impacts to Indigenous rights, title and interests.

Responding to Key Engagement Themes

Throughout both phases of engagement we heard similar themes from Forest Grove residents, regional residents and Indigenous Nations. These themes have been summarized in the following table.

Local and Regional Interests

Safety
- Safe and secure system

Transportation
- Improving transit experience for current and future passengers
- Decreasing transit wait times
- Increasing transit reliability

Neighbourhood
- Noise
- Property value impacts
- Privacy
- Visual presence

Environment
- Limiting environmental impact from construction and operation of the system
- Support for reduction in GHG emissions from gondola
- Environmental impacts to Burnaby Mountain Conservation Area from gondola infrastructure and increased use of conservation area
- Impacts to watercourses and waterways

System design & project need
- Questions about the operation of the gondola
- Expressed desire to build the project
- Consider use of electric buses instead of a gondola

Indigenous Interests

Archaeological
- Avoid impacting archaeological sites
- Desire to understand more about the archaeological presence of Indigenous peoples

Cultural
- Avoid impacting places with current and historical cultural importance
- Desire to gain more understanding of historical cultural uses

Environment
- Limiting environmental impact from construction and operation of the system
- Support for reduction in GHG emissions from gondola

Throughout the engagement we responded to these questions and comments with current project information or by noting that further exploration could occur through more detailed design, analysis or mitigation. Appendix 1 contains direct quotes from survey participants, a summary of interests and TransLink's response. Further, the Findings section outlines commitments by TransLink, should the project proceed.

Findings

Findings

The objective of the planning program was to move from three potential gondola routes to a single, preferred route. To achieve this objective, TransLink undertook a conceptual design of the three routes, engaged with the public and Indigenous Nations to understand what values and criteria matter to them, and gauged levels of support for the project.

This information was then fed into the route evaluation. After completing the route evaluation, TransLink shared this information with the public and Indigenous Nations to gauge levels of support for the gondola project and the three potential routes.

		Route 1	Route 2	Route 3
Project benefits	Transportation user experience	Most transit and auto travel time savings, greatest number of SFU buildings within a 5-minute walk	Second most transit and auto travel time savings	Least transit and auto travel time savings
	Sustainable transportation	Greatest boardings and most GHG emission offsets	Second greatest boardings and second most GHG emission offsets	Lowest boardings and least GHG emission offsets
Financial considerations	Financial stewardship	Lowest capital, operating, and maintenance cost	Highest capital, operating, and maintenance cost	Second lowest capital, operating, and maintenance cost
Implementation considerations	Neighbourhood	Visual impacts to Forest Grove neighbourhood Gondola would pass directly over two multi-family properties	Visual impacts to Rathburn neighbourhood	Visual impacts to Meadowood neighbourhood
	Environment	Lowest environmental impacts	Tied for highest environmental impacts	Tied for highest environmental impacts
	Utilities	Most favourable geotechnical conditions, no significant utility conflicts	Average geotechnical conditions, conflict with high-voltage transmission lines	Poor geotechnical conditions, proximity to Trans Mountain right of way
Overall assessment		Greatest benefits Lowest cost Lowest impacts	Lower benefits Higher cost Higher impacts	Lowest benefits Higher cost Somewhat higher impacts

There was strong support for the gondola project through both phases of engagement and across all municipalities and age groups (84%, 83%). Burnaby residents affiliated with SFU (work or study) had very high levels of support for the gondola (90%, 88%). Burnaby residents (not affiliated with SFU or Forest Grove) have continued to demonstrate strong support for the gondola through two rounds of engagement (75%, 76%).

Survey respondents from across the region and all Burnaby geographies indicated a preference for Route 1.

	Route 1 Support	Route 2 Support	Route 3 Support
All responses	85%	19%	12%
Metro Vancouver *(not including Burnaby)*	90%	18%	11%
Burnaby	74%	20%	15%
Burnaby *(non-SFU and non-Forest Grove)**	83%	16%	11%
Burnaby *(SFU)***	90%	20%	16%
Forest Grove	30%	23%	21%
UniverCity	89%	25%	13%

** Excludes Burnaby residents who study or work at Simon Fraser University's Burnaby campus or at a workplace within UniverCity, as well as residents living in the UniverCity or Forest Grove communities.*

***Includes all respondents who self-identify as affiliated with Simon Fraser University, except for residents of UniverCity.*

Together, the technical analysis and the public and Indigenous feedback has helped to inform the identification of a single gondola route. Pending direction from decision-makers, including Burnaby City Council and the Mayors' Council, next steps include pursuing project funding and further analysis through our business casing process.

The results of the route evaluation, coupled with the feedback from the public and Indigenous engagement, are conclusive:

Route 1 has the greatest customer benefits, lowest costs, and lowest environmental impacts, and is the preferred and recommended gondola route.

Travel time savings and the connection to the rapid transit network provides the opportunity to improve the lives of thousands of residents from Burnaby and other Metro Vancouver municipalities who travel up and down Burnaby Mountain every day.

However, Route 1 passes through the Forest Grove community and directly over two multi-family residential properties. Should the project advance, steps would be taken during design, construction, and operation to mitigate the impact of the gondola system on the Forest Grove community and on the directly affected properties. The next section outlines TransLink's documented commitments to address community concerns.

Further, property rights would need to be acquired to permit aerial passage of the gondola over relevant properties. Residents could continue to live in their homes and would be compensated for potential impacts to property values.

Finally, continued engagement with the Forest Grove community is key, especially as it relates to future design work, mitigations and analysis. TransLink commits to ongoing engagement with Forest Grove residents, stakeholders, the public, and Indigenous Nations.

Future Design Work, Mitigations and Analysis

Should the gondola project advance, refinements to the design and construction will occur, mitigations will be considered, and supportive analysis will continue. In response to feedback from the Forest Grove community, general public, and Indigenous Nations, TransLink has identified future project commitments.

FUTURE PROJECT COMMITMENTS

Avoid increases in noise

- TransLink commits to designing a gondola system that does not exceed background noise levels in Forest Grove.
- Additional noise modelling will be conducted to verify this commitment; in addition, TransLink will model in-cabin noise impacts on the Forest Grove neighbourhood.

Protect residential privacy

- TransLink will explore outfitting gondola cabins with tinting windows that will automatically block visibility into homes in the Forest Grove neighbourhood.

Minimize property impacts

- TransLink will continue to refine the gondola design to minimize the number of properties and residential units within the gondola right of way.

Compensate impacted residents

- TransLink will provide compensation to the two multi-family property complexes for aerial passage of the gondola. Residents can remain in their homes and are not required to move.

Maximize safety

- TransLink will undertake a safety assessment to better understand risks to the system from external sources and incorporate mitigations into the design.
- TransLink will develop operational safety procedures with guidance from ropeway experts.
- TransLink will conduct industry-standard maintenance to ensure the integrity of the system.
- TransLink will implement design and policy measures to ensure passenger safety.

Minimize visual presence

- TransLink is committed to assessing the visibility of the gondola and using natural topographic features and design elements to minimize the visual presence of the gondola in the Forest Grove neighbourhood.

Minimize environmental impacts

- TransLink will continue to assess and mitigate potential environmental impacts of the project.
- TransLink will seek to minimize construction-related environmental impacts.
- TransLink will adhere to tree replacement and other requirements in the City of Burnaby's Tree Bylaw.

Minimize impacts to Indigenous heritage resources

- TransLink will commit to conducting an Archaeological Impact Assessment (AIA) for ground disturbing activities in areas identified as AIA required.
- TransLink will ensure that all crews conducting ground disturbing activities within any portion of the project area receive Chance Find Training and a project specific *Chance Find Procedure*.
- TransLink will continue to engage with the Indigenous Nations to better understand areas of current and traditional cultural importance.

How the gondola contributes to government policy objectives

City of Burnaby

The City of Burnaby is currently updating its city-wide Transportation Plan. The plan contains six themes, each with goals, City-wide targets, and big moves. TransLink reviewed the draft plan with respect to policy alignment with the proposed Burnaby Mountain Gondola.

THEMES AND GOALS

Themes	Goals	How the gondola contributes
Accessible	• Provide people with multi-modal access to their homes, jobs, shops and businesses, educational opportunities, extracurricular activities, and other designations; • Provide travel options that are easy, reliable, and flexible; and • Provide inclusive access and choice for people of all ages, abilities, socio-economic levels, and backgrounds.	• Gondola may increase the accessible capacity for passengers traveling to/from Burnaby Mountain as it could include both dedicated priority seating and flex space to accommodate mobility devices (like SkyTrain). • With cabins departing every minute, passengers would experience less wait times for priority seats of flex space than they do with bus.
Safe	• Reduce deaths, injuries and conflicts for all modes.	• Gondola could reduce collisions in Burnaby with more drivers choosing to take transit that is fast, frequent and reliable.
Healthy	• Increase the proportion of trips by active transportation modes (walking, cycling, and transit); • Increase the enjoyment of moving around the City; and • Increase the social opportunities for people to interact with each other and their community.	• Gondola would increase accessibility to SFU and the social, cultural and recreational opportunities that it provides. • Gondola would improve access to natural spaces and recreational opportunities within the Burnaby Mountain Conservation Area.

Themes	Goals	How the gondola contributes
Green	• Increase the use of more sustainable transportation modes including walking, cycling, transit, car-share, low- or zero-emission vehicles, etc.; • Reduce the environmental impacts of transportation (GHG emissions, pollution, and noise); and • Reduce the distances driven overall.	• Gondola would operate using a sustainable energy source: hydro-electric power. • With its increased reliability, frequency, and reduced travel times, gondola would incentivize mode switch from vehicle to transit and reducing distances driven.
Prosperous	• Increase the convenience, cost-effectiveness and reliability of all modes; • Consider opportunities for new technologies and ways of traveling; and • Increase the efficiency of finite road space.	• Gondola costs 30% less to operate than current bus service, with savings reinvested into TransLink's network. • The Burnaby Mountain Gondola would be the first urban transit gondola in North America integrated into a rapid transit network. • As the gondola would travel above the road network, it would free up space from a reduction in bus and general-purpose traffic.
Connected	• Provide integrated transportation networks that connect the City's neighbourhoods and surrounding communities.	• Gondola would connect the UniverCity community to the rest of the region via the rapid transit network.

CITY-WIDE TARGETS

The City of Burnaby has identified three draft targets for Burnaby's Transportation system. The following details how the gondola contributes to achieving the targets:

Target	Objective	How the gondola contributes
Vision Zero	Zero deaths and serious injuries on Burnaby's transportation network.	Reduction in vehicle use and congestion will contribute to a reduction in accidents of approximately 16 fewer accidents per year.
Mode Split: For all trips originating in the City: • By 2030, half of all trips will be by public transit or active transportation. • By 2040, 2/3 of all trips will be by transit or active transportation. • By 2050, 3/4 of all trips will be by transit or active transportation.	Improved mobility for all users of the transportation network.	Gondola would result in transit travel time savings with a fast, frequent, and reliable service. It will encourage more people to take transit who are currently driving. Gondola would provide a 13% average travel time savings for passengers traveling to/from anywhere on our transit network to SFU.
Zero Emissions: • By 2030, reduce GHG emissions from transportation by 45%. • By 2040, reduce GHG emissions from transportation by 75%. • By 2050, zero GHG emissions from transportation.	Achieve target of zero emissions from transportation by 2050.	Gondola will operate on 100% renewable energy and result in a reduction in annual vehicle and diesel bus related GHG emissions. Annual reduction: • Total 5,100 tonnes $C0_2e$ • 1,400 tonnes $C0_2e$ auto • 3,700 tonnes $C0_2e$ diesel bus

TransLink Policy Objectives

Gondola has been identified as a regional transit priority since 2013.

REGIONAL TRANSPORTATION STRATEGY

TransLink's Regional Transportation Strategy (RTS) establishes strategic priorities for the regional transportation system. It sets out regional targets that aim to have half of transportation trips by sustainable mode (transit, walking, cycling) and a reduction in distances driven by one third. Gondola could contribute to both targets. Further, it was identified as a long-range regional priority in the RTS.

MAYORS' COUNCIL 10-YEAR VISION

The Mayors' Council, with support from TransLink, Metro Vancouver, and member municipalities, developed Regional Transportation Investments – a Vision for Metro Vancouver in 2014. This 10-Year Vision established spending priorities, recommended new funding mechanisms, and outlined a phased implementation plan.

There are currently 25,000 daily bus trips to and from Burnaby Mountain, and demand is expected to grow by 60% in the next 20 years. This may require a high-capacity connection from the mountain to the nearest SkyTrain station.

This initiative requires further investigation and consultation, and could be advanced subject to the business case, funding, partner contributions and achievement of other initiatives contained in this Vision.

PHASE ONE AND PHASE TWO INVESTMENT PLANS

In June 2016, the Phase One Investment Plan of the 10-year Vision was approved. The Plan calls for updating the 2011 assessment of a high-capacity transit connection between SkyTrain and Burnaby Mountain campus, to establish whether the business case supports its inclusion in a future investment plan. The Burnaby Mountain Gondola Transit – Feasibility Study was completed in 2018.

In June 2018, the Phase Two Investment Plan was approved. It allocated funding for planning activities for a potential gondola to SFU Burnaby campus.

Provincial Policy Objectives

Following the provincial election in fall 2020, ministerial mandate letters were issued to confirm their priorities. TransLink is the shared responsibility of both the Ministry of Environment and Climate Change Strategy and Ministry of Transportation and Infrastructure. A Burnaby Mountain Gondola will assist the government in achieving directives in these two ministries:

"Accelerate the move toward a net-zero emission bus fleet powered by electrification, hydrogen fuel cell technologies, and other zero-emissions technologies, including supporting TransLink's "aggressive" level plan." – Minister of Environment and Climate Change Strategy, Mandate Letter

"Work with the Minister of Municipal Affairs and Minister of State for Infrastructure to support economic recovery from the effects of the COVID-19 pandemic in communities across B.C. by continuing to build important infrastructure projects, including through StrongerBC and the Investing in Canada Infrastructure Program." – Minister of Transportation and Infrastructure, Mandate Letter

THE OPPORTUNITY: ACCELERATE THE TRANSITION TO A NET-ZERO EMISSIONS TRANSIT FLEET, ENCOURAGE MODE SHIFT.

The gondola would accelerate the transition to a net-zero transit fleet by replacing 24 buses.

The gondola could reduce 5,100 tonnes of CO_2e annually (3,700 tonnes CO_2e emitted from bus, and 1,400 tonnes CO_2e reduction from mode shift).

Improve customer experience by replacing overcrowded buses, improving unpredictable wait times and increasing reliability of travel during adverse seasonal weather conditions.

A gondola would provide fast, frequent, reliable transit service connecting SFU's primary campus to the SkyTrain network.

Greater reliability, reduced wait times, and faster trips will encourage more drivers to switch to transit.

THE BENEFIT: COST SAVINGS, BETTER SERVICE AND EXPANDED TRANSIT CAPACITY

Once built, the gondola would cost 30% less to operate and maintain than current bus service.

Transit capacity would increase to 3,000 passengers per hour per direction.

If funded and approved, the gondola could be operational within two years, providing construction jobs, supporting the provincial objectives to reduce GHG emissions, and increase the sustainable transportation mode share.

Federal Policy Objectives

In late 2020, the federal government announced Canada's Climate Plan to reduce GHG emissions, grow the economy, and build resilience to a changing climate. The Plan identifies the need to reduce emissions in the transportation sector, which account for 25% of national emissions. To reduce emissions, the Plan outlines the need to transition to a low-carbon transportation system. To support this transition, a "shift from higher to lower-emitting types of transportation, including through investing in infrastructure" is required.

This shift can be achieved by encouraging mode shift from private auto to public transit. In February 2021, the federal government committed funding for stable investment in public transit, new transit infrastructure and system extensions. The Burnaby Mountain Gondola would contribute to this mode shift by making transit more competitive, comfortable, and reliable.

Conclusion

The potential Burnaby Mountain Gondola project advances local, regional, provincial and federal policy objectives. Route 1 has the greatest customer benefits, lowest costs, and lowest environmental impacts, and is the preferred and recommended gondola route. Should the project secure approvals and funding, TransLink would then develop a business case to further refine costs and design, update the economic analysis, conduct an environmental review, and continue its public, stakeholder and Indigenous engagement.

Appendix 1

Responding to Key Engagement Themes

Burnaby Mountain Gondola:
Responding to Key Engagement Themes

Table of Contents

Context

Throughout both phases of engagement we heard similar themes from Forest Grove residents, regional residents and Indigenous Nations. During the engagement we responded to these questions and comments with current project information or by noting that further exploration could occur through more detailed design, analysis or mitigation.

This document details the key themes we heard from engagement. It contains direct quotes from the engagements that are then re-phrased as questions. The responses were categorized by type:

- **Information:** a response that provides information;
- **Design:** a response that indicates whether the topic would be explored in future design phases should the project advance;
- **Analysis:** a response that indicates whether the topic would be considered for additional analysis should the project advance; and
- **Commitment:** a response that indicates what TransLink's commitments are with respect to the gondola project should it advance. These also include project mitigations.

This document captures the flow through of information from what we heard from the engagements, to work we have undertaken, and future work and commitments should the project advance.

Safety

1. **What we heard: Make sure the gondola is safe.**

How safe are gondolas?

Information: Gondola systems are a proven safe technology with more than 20,000 ropeway systems worldwide. The proposed Burnaby Mountain Gondola would be a 3S system, which operates using three high-strength, multi-strand steel cables. Gondola cabins would be stored in stations overnight as opposed to leaving them on the line. The system would come with strong security measures in place to monitor the integrity of the gondola, like what is in place for SkyTrain, and the towers would be designed to prevent unauthorized access.

2. **What we heard: A gondola is an excellent idea, but Translink will have to take an active approach to security, especially in light of the Sea to Sky gondola incidents.**

What specific measures could be put in place to prevent an act of vandalism that could cause the system to fall?

Analysis and Design: The system would come with strong security measures in place to monitor the integrity of the gondola, like what is in place for SkyTrain, and the towers would be designed to prevent unauthorized access. Specific measures could include:

- Physical barriers, gates, and locks could be used to impede access to critical components of the system;
- Towers could be gated, or designed with unclimbable, tubular structures surrounding them; and
- Maintenance ladders could be placed on the inside of the towers with lockable doors and monitored with a security system.

3. **What we heard: The Sea to Sky gondola has been tampered with again.**

Was there a flaw in the Sea to Sky gondola system that contributed to its failure?

Information: A report by Technical Safety BC released on October 30, 2020, confirmed that the Sea to Sky Gondola's cable was vandalized. There were no design, installation, or manufacturing flaws that contributed to the failure of the system. The director of risk and safety knowledge with Technical Safety BC confirmed that this is exceptionally rare for this industry and that the integrity of these types of systems is robust.

4. **What we heard: A gondola is so much safer. I had a friend who was severely injured in a car accident on the hill.**

Are gondolas or buses safer?

Information: The safety of everyone involved – passengers and nearby residents – will be a top priority for TransLink if this project proceeds. Gondola technology has an excellent safety record. In Switzerland, where gondolas and aerial trams are commonly used, ropeway transportation systems have higher safety rankings than bus, rail, and tram systems. While all modes of transportation carry risks, we are confident in the advanced safety features embedded in the 3S technology the gondola would utilize, should the project proceed.

5. **What we heard: As high winds and ice would shut down gondola use, it would be important to have back up plans and factor in those costs as well.**

Is the gondola safe in the wind?

Information: The 3S gondola system can operate safely in winds of up to 100 km/hr. Having a three-cable system increases the stability of the gondola. In addition, the proposed gondola would be equipped with a weather monitoring system to keep operators aware of weather and wind conditions.

6. **What we heard: I just hope the engineers can get it right look at cable bridges Port Mann and Alex Fraser. Some design faults with ice bombs etc.**

Would the gondola cables ice-up in the winter leading to ice-bombs similar to what has happened on the Port Mann Bridge?

Information: It would be quite unlikely for the gondola cables to ice-up, given the cabins move continuously. If ice was to form while the lift is operating, it would come off at the towers as the cabins pass, but in very small particles, similar to snow. If any ice formed overnight, onsite maintenance staff would take steps to mitigate the ice formation (e.g. operating the lift at slow speed with reduced cabins overnight).

The proposed gondola is a three-cable system that is the same as the Peak to Peak Gondola in Whistler Blackcomb that has been operating safely since 2008.

7. **What we heard: If there's a disaster at the tank farm, the gondola may not be able to operate right over top of it.**

How safe would the gondola infrastructure be in the event of a hazardous event at the nearby Burnaby Mountain storage terminal (i.e. tank farm)?

Information: Trans Mountain has indicated they have concerns with the safety and security of Route 3, given its proximity to the Burnaby Mountain storage terminal (i.e. tank farm). Routes 1 and 2 would operate within a safe distance from the terminal. Should the project advance, we would engage with Trans Mountain to better understand mitigations and safety protocols related to the operation of the proposed gondola.

8. **What we heard: Will there be a solid emergency plan in the event of a fire at the tank farm**

What are the emergency procedures in the event of an incident at the Burnaby Mountain storage terminal (i.e. tank farm)?

Analysis: A safety plan that includes a risk assessment of threats to the system would be conducted should the project advance.

etc.?

How safe are gondolas in the event of an earthquake?

Information: Gondola systems are used in earthquake-prone zones around the world, including here in British Columbia as well as in California. Gondolas are more resistant to earthquakes than most structures, and the Burnaby Mountain gondola system would be designed to be seismically resilient. If the gondola is approved and funded, a detailed geotechnical evaluation would take place in order to ensure the final design of the gondola is compatible with the specific geotechnical conditions on Burnaby Mountain. Should the project proceed, a sophisticated emergency management plan would be put in place, including redundant machinery, backup power sources, and trained personnel to conduct evacuations, if needed.

Analysis: A safety plan that includes a risk assessment of threats to the system would be conducted should the project advance.

9. **What we heard: Would there be a danger of collapse in the event of a powerful earthquake?**

10. What we heard: Please ensure it's reliable and safe to use during mountain evacuations / campus closures.

Could the gondola act as a safe way off Burnaby Mountain in the event of a major incident in the area that limits road access?

Analysis: A gondola to Burnaby Mountain could provide an alternate route off the mountain in the event of a major incident, where today there is only one road down from the top of the mountain. However, we would seek to clarify during which potential hazards the gondola could act as an alternate route off Burnaby Mountain.

11. What we heard: What is being done for security for those in cabins? Video?

With what kind of safety features can the gondola be equipped?

Information and Design: Gondola cabins could include closed-circuit video that can be monitored by staff to promote safety and security. Cabins could also be equipped with call buttons and intercoms that allow passengers to contact staff.

12. What we heard: Good idea to have transit security posted at both ends to ensure safety at night or at less busy operating hours.

Will there be staff at nighttime or less busy times?

Information: During operating hours there will be staff present, gondola attendants assisting with boarding cabins and staff working in the operation booths.

What if a passenger feels unsafe riding a gondola late at night?

Information: Passengers could choose to ride alone or only with people they know during times of low ridership, such as later in the evenings. In addition, gondola cabins can include closed-circuit video that can be monitored by staff to promote safety and security. They can also be equipped with call buttons and intercoms that allow passengers to contact staff.

Transportation & Project Need

1. **What we heard: The gondola is a done deal.**

What is the status of the Burnaby Mountain Gondola Transit project and what has to happen for it to be built?

Information: We are currently in the process of doing more technical work related to the three proposed routes with public engagement planned for fall 2020. The outcome of the technical work and two rounds of engagement throughout 2020 has lead us to a preferred route. Burnaby City Council and the Mayors' Council will review the findings of the Route Selection Report and provide direction on next steps. Subject to the support of Burnaby City Council and Mayors' Council approval, the next step would be to develop a business case, which would be shared with our government partners for their review and as a means to seek potential funding contributions. Prior to a gondola being built, TransLink would need to secure funding for the project.

2. **What we heard: More courses are being provided online reducing the demand to transport bodies.**

Most SFU students are on campus for only eight months of the year. Is there enough demand throughout the year to warrant a gondola?

Information: Yes, the demand for transit service to Burnaby Mountain warrants a gondola. Even today, for a majority of the year, there are 25,000 trips made up and down Burnaby Mountain for school, work, business and recreation. In addition, the residential community of UniverCity has a population of roughly 5,200 residents and that number is expected to nearly double in the next four years. While there are generally lower ridership levels to Burnaby Mountain in the summer months, we would also expect to see an increase in tourists at that time, similar to our SeaBus ridership.

3. **What we heard: How has ridership evolved? Need reliable data.**

What is the ridership between SkyTrain and Burnaby Mountain?

Information: Burnaby Mountain is currently served by four bus routes: R5, 143, 144, and 145. Between 2015-2019, transit ridership to/from Burnaby Mountain was 25,000 trips per day. At this level of ridership, customers often experience unreliable service and overcrowding. These problems are expected to worsen as the daytime (SFU student and staff) and permanent residential communities grow. Transportation modelling found a steady increase in trips of approximately 2 per cent per year.

4. What we heard: Just add more buses

Can't you just add more buses to meet the ridership demand?

Information: Buses serving Burnaby Mountain currently run every 5 minutes. Even at this frequency, during peak hours there are more people trying to board each bus than there is space available on the bus (demand exceeds capacity). This means that our customers often experience unreliable service and overcrowding when trying to transit up and down Burnaby Mountain. These problems are expected to worsen as the daytime (SFU student and staff) and permanent residential communities grow.

We cannot keep adding buses to solve the capacity issue. There are a fixed number of buses that we can efficiently operate on a route and we are nearing the upper limit. Buses need to run their routes, have layovers, and in the case of electric buses, charge.

We cannot add enough buses to meet current demand, nor the future anticipated demand from the growing student, staff, faculty, and residential population. A key limitation as to how fast we can operate buses is constrained by the time it takes people to board and exit a bus. The fastest observed frequency of bus operation on our network is every 2.5 minutes and that would not address our overcrowding problem.

5. What we heard: Need info on travel time savings between bus and gondola.

What are the travel time savings of gondola?

Information: The gondola would provide a 6-minute service between SkyTrain and Burnaby Mountain. The current 145 takes about 15 minutes. Our transit forecasting model found that the gondola will reduce total trip times by 13% for trips to/from anywhere on our network. And over the course of the year that could be a 56-hour annual savings for an average transit user.

6. What we heard: I am afraid of heights, will buses keeping going to SFU?

What buses would continue operating on Burnaby Mountain?

Information: Existing transit service to Burnaby Mountain consists of four bus routes: R5, 143, 144, and 145. The gondola is proposed to replace Routes 143 and 145. No changes are proposed for Route 144 or the R5 RapidBus.

7. **What we heard: Students who already have to take a bus and or SkyTrain to even get to Production Way, every minute counts when you have a long commute time.**

Why would a gondola be needed to replace bus service?

Information: The 145 is the most direct path from the SkyTrain network to Burnaby Mountain that is served by both Expo and Millennium lines and there is overcrowding on a regular basis. During peak periods, passengers often experience unpredictable travel times, with frequent pass-ups, adding 5-30 minutes to what should be a 15-minute trip. A gondola would help to address today's transit challenges and allow us to better meet future demand.

8. **What we heard: SFU has a summer semester which brings in approximately 70% of the regular students. No one is on campus in the summer.**

Most SFU students are on campus for only eight months of the year. Is there enough demand throughout the year to warrant a gondola?

Information: Yes, the demand for transit service to Burnaby Mountain warrants a gondola. Even today, for a majority of the year, there are 25,000 trips made up and down Burnaby Mountain for school, work, business and recreation. In addition, the residential community of UniverCity has a population of roughly 5,200 residents and that number is expected to nearly double in the next four years.

While there are generally lower ridership levels to Burnaby Mountain in the summer months, we would also expect to see an increase in tourists at that time, similar to our SeaBus ridership.

9. **What we heard: Classes are now online, no need for masses of students/staff to attend SFU site**

In light of COVID-19 impacts and the shift to virtual learning, is it still prudent to build a gondola connecting to Burnaby Mountain where the majority of commuters would be associated with SFU in some way?

Information: Despite COVID-19, SFU's residences on Burnaby Mountain are home to hundreds of students, and there are an additional 5,200 residents in UniverCity. Essential service workers, researchers, students and staff are also commuting to Burnaby Mountain for work, research and approved in-person course work even at this time. SFU continues to safely expand on-campus activity and they plan to resume in-person classes and labs, and a full complement of student experience activities on the Burnaby campus as soon as it is safe to do so.

10. What we heard: Why isn't TransLink considering electric buses instead of gondola

Is TransLink considering other technologies to connect Burnaby Mountain to the SkyTrain?

Information: Past studies considered a number of ground-based and aerial transit options and led to the 3S gondola technology as the preferred solution to connect Burnaby Mountain to SkyTrain.

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.

We recently consulted with two aerial ropeway suppliers on technology options who confirmed that 3S technology remains the best option.

Why are increasing buses, clean-energy buses, better snow removal and/or other solutions not being considered to meet the transit needs in the area?

Information: More buses will not solve our current and future capacity problem. From the first studies conducted in 2011, to our feasibility study in 2018, and including the technical work we have done through 2020, a gondola service is still considered the best option for high-capacity transit to SFU's Burnaby Mountain. A gondola service would be able to move more people per hour and support increasing demand for travel to Burnaby Mountain as SFU enrollment and the surrounding UniverCity community continues to grow. Once constructed, it would cost less to operate than the current diesel bus fleet and produce less greenhouse gases. It would also support faster travel times for customers and be more reliable, particularly during ice and snow conditions.

11. What we heard: Make the gondola cars big enough to move large numbers of people.

What is the total system capacity?

Information: With a maximum number of 20 cabins, the gondola system would be built to support an ultimate capacity of 3,000 passengers per hour per direction (pphpd).

12. What we heard: I ride the bus and want to continue riding the bus.

Would you still offer bus service as an alternative for people who wouldn't want to take the gondola?

Information: We would continue to provide bus service to Burnaby Mountain. If the proposed gondola becomes a funded project, we would review bus route and frequency needs at that time.

Routes

1. What we heard: What are the potential gondola routes?

How many routes were assessed and what are the characteristics of each route?

Information: Three potential routes linking Burnaby Mountain to the SkyTrain have been identified. Route 1 has been identified as the preferred route as it has the greatest benefits, lowest cost, and least impacts. Route 1 is also the most supported route by the public across all geographies and demographics.

Route 1 is a straight-line route from Production Way–University Station to SFU Burnaby campus with the terminal located near the bus exchange.

- Route length: 2.7 km
- Number of towers: 5
- Gondola travel time: 6 minutes
- SkyTrain lines served: Expo and Millennium Lines
- Lower terminal: Next to bus loop at Production Way–University Station
- Upper terminal: Next to SFU Town Square

Route 2 is the eastern route from Production Way–University Station, travels along Gaglardi Way, changes direction at an angle station, and continues to SFU Burnaby campus with the terminal near the bus exchange. No passenger boarding is proposed at the angle station.

- Route length: 3.7 km
- Number of towers: 7
- Gondola travel time: 11 minutes
- SkyTrain lines served: Expo and Millennium Lines
- Lower terminal: Short walk from Production Way–University Station
- Upper terminal: Next to SFU Town Square

Route 3 is the western route from Lake City Way Station to SFU Burnaby campus, crosses the Burnaby Mountain Golf Course, and changes direction at an angle station, and continues to SFU Burnaby Campus with the terminal located south of South Campus Road. No passenger boarding is proposed at the angle station.

- Route length: 3.6 km
- Number of towers: 7
- Gondola travel time: 10 minutes
- SkyTrain line served: Millennium Line
- Lower terminal: Next to Lake City Way SkyTrain Station
- Upper terminal: Located south of South Campus Road at Science Road

2. What we heard: Have all other route options been explored and exhausted? What alternatives are still missing from the conversation?

Information:

Route 1: The 2011 business case considered several route options, including straight-line service from various SkyTrain stations. Production Way–University Station was chosen, given it is the closest station and the most convenient for the largest number of potential users.

Route 2: The 2018 Feasibility Assessment added the eastern route (with a non-boarding angle station) from Production Way–University Station to address public concern regarding the route being above the residential neighbourhood of Forest Grove.

Route 3: In 2019, at the request of Burnaby Mayor and Council, the western route (with a non-boarding angle station) from Lake City Way Station to Burnaby Mountain was added to address public concern regarding the potential environmental impacts of Option 2 and public concern regarding the route being over the residential neighbourhood of Forest Grove.

In 2011, three other routes were assessed and deemed infeasible, including:

Lake City Way Station to South Campus Road (across from South Sciences Building) – crossed over the Burnaby Mountain storage terminal (i.e. tank farm) and presented significant safety risks.

Production Way–University Station to the intersection of Highland Court and Tower Road – significant residential impacts and lack of SFU campus and UniverCity integration.

Burquitlam Station to SFU Bus Exchange – significant impacts to the Burnaby Mountain Conservation Area.

3. What we heard: If you go with routes 2 or 3, there should be the opportunity to board at the angle stations in order to support future development and density.

What is an angle station?

Information: Gondola systems are restricted to straight lines. An angle station is a station along the route where gondola cabins can be redirected if a straight path of travel is not possible. The angle stations TransLink is proposing for Routes 2 and 3 would not allow for passenger boarding.

Would there be passenger boardings at the angle stations?

Information: No, the three routes under consideration have termini locations at the SkyTrain network and Burnaby Mountain. Constructing a passenger accessible midpoint, or angle station would add to the cost of the potential gondola project, slow down travel time for passengers traveling from the SkyTrain network to Burnaby Mountain, and the angle stations are not located near significant residential or commercial areas.

4. **What we heard: Route 3 with expo line extension to Lake-City is the most logical option with minimal community and ecological impacts.**

Could the Expo Line be extended to Lake City Way making Option 3 a more feasible option to connect SkyTrain to Burnaby Mountain?

Information: It is not feasible to extend the Expo Line to Lake City Way. Extending the SkyTrain to Lake City Way would require more SkyTrain cars to maintain the current service levels across the Expo Line. Without extra cars, the frequency between trains would slow, meaning passengers would have to wait longer. There would also be additional operating and maintenance costs associated with extending the route. Such an investment would greatly impact our ability to invest elsewhere in the network where there is a higher demand for service.

SYSTEM DESIGN

5. **What we heard: What type of gondola are you thinking about?**

What is the 3S gondola technology proposed for the Burnaby Mountain Gondola?

Information: The 3S gondola proposed to connect to Burnaby Mountain is an aerial transportation system. It carries passengers comfortably in gondola cabins from station to station. It is a three-cable technology that is the same as the Peak to Peak Gondola in Whistler Blackcomb.

6. **What we heard: Aren't gondolas just for skiing?**

How many aerial gondola systems are there worldwide?

Information: Gondola systems are a proven technology with more than 20,000 ropeway systems worldwide. For example, the system in Voss, Norway, has nearly 25,000 trips on an average day, and the system in Koblenz, Germany, has more than 91,000 trips per day.

7. What we heard: Do other gondolas go over residential neighbourhoods?

Are there examples of gondola systems that operate over residential neighbourhoods similar to those that would be impacted in Burnaby if the gondola was to be built?

Information: The Portland Aerial Tram passes over the Corbett-Terwilliger and Lair Hill neighbourhoods. The cabins pass between 12 and 21 metres above homes. For the Burnaby Mountain Gondola, we would have a minimum cabin clearance of 61 metres above the Forest Grove residences. The design was governed by the tree heights around the neighbourhood and is much more conservative than the Portland Aerial Tram.

8. What we heard: What is part of the gondola system?

How fast could the gondola travel?

Information: For comparison, the Peak2Peak 3S gondola can travel up to 8 m/s or 27 km/hr. However, the speed of the gondola is determined by the number of towers. The more towers, the slower the overall average speed as the gondola must slow down and speed up after it passes through each tower.

What do gondola towers look like?

Information: A standard gondola tower is a lattice structure, like a BC Hydro transmission tower. A custom gondola tower is cylindrical in shape and constructed out of concrete. Tower heights can be short or tall. A shorter tower means the gondola system is located closer to the ground, a taller tower height (approx. 90 m) moves the gondola up and over buildings and the forest canopy.

How many towers would this gondola likely have?

Information: Route 1 would have five towers.

Where are the terminals?

Information: The lower terminal would be integrated into the Production Way–University SkyTrain station. The upper terminal would be located near the existing SFU bus exchange.

9. What we heard: How many people can go on a cabin?

What is the capacity of a gondola cabin?

Information: The maximum capacity of a gondola cabin is 35 passengers.

Will everyone have a seat, or can people stand as well?

Information: Most passengers will have a seat (approx. 28) and there will be also be some standees (approx. 7). A maximum of 35 passengers will be allowed per cabin.

10. What we heard: Want to make sure that there's air conditioning and heating in the gondola cabins to combat the hot summer months and the cold winter.

Would the gondola include a heating/air-conditioning system?

Information: The proposed Burnaby Mountain Gondola would have a ventilation system that either uses the speed of the cabins or fans to move fresh air though the cabins. Heating and air-conditioning is also an option. These systems can be adjusted seasonally to operate when needed and otherwise remain inactive.

11. What we heard: What needs to be maintained on the system and when will it occur?

Where would the gondola maintenance take place?

Information: Maintenance would occur regularly on the cabins, in the station and at the towers.

When would the maintenance of the system take place?

Information: Like SkyTrain, most system maintenance would occur at night or when the system is scheduled to be out of operation.

What if the gondola requires repairs? Would you need to shut down the entire system? Wouldn't that be far more impactful than one bus being out of service?

Information: Routine system maintenance would occur, similar to SkyTrain, when the gondola is not in operation. This would help to lessen any unplanned maintenance. When larger scale maintenance would be required, we would plan for that during periods of lower demand and continue to serve customers using buses.

12. What we heard: Consider what will happen in the event of a system failure

What if the gondola system shuts down unexpectedly due to a mechanical failure? How would all of those customers get up the mountain?

Information: As is the case today on the rare occasion when the SkyTrain system is shut down for a period of time, we would establish a bus bridge to assist customers in a timely manner.

OPERATIONAL

13. What we heard: When will the gondola operate?

What would the hours of operation be?

Information: We anticipate the gondola service would have the same hours of operation as SkyTrain.

14. What we heard: Gondolas would leave more frequently than bus.

How frequently would each cabin arrive?

Information: During peak periods, the gondola system would operate continuously with cabins departing about every minute. In periods of low demand, (i.e. early morning, midday or late at night) the frequency could be reduced to better meet demand.

15. What we heard: Please make accessible by compass card.

Would passengers access the gondola using tickets or with a Compass card?

Information: The gondola would be fully integrated into our transit system, so passengers would access it using the same fare options.

16. What we heard: How much will it change the current fare.

How would the fare be calculated for a gondola ride?

Information: The gondola would be fully integrated into our current zoned based transit fare system. As a gondola trip would occur within a single zone (i.e. within Burnaby), it would be a one-zone fare. However, if a person was to start their trip in another zone and end at SFU, then gondola may be a two- or three-zone trip.

17. What we heard: More information about how bikes etc. will be handled would be helpful.

Would bikes be allowed on the gondola? If so, would there be any restrictions?

Information: Yes, bikes would be allowed on the gondola. The number of bikes per cabin would depend on the interior design. That said, if space wasn't available when a passenger with a bike arrived, they would only need to wait a short time before the next cabin would depart.

Analysis and Design: Details related to bike usage on the gondola would be determined at a later stage through passenger modelling if the project proceeds. Details specific to the hourly carrying capacity of bikes on the gondola would be determined at a later stage, if the decision is made to proceed with the project. TransLink would work with stakeholders to better understand the needs of the cycling community in the gondola design and policy development.

Will customers with sight loss or people traveling with bikes, strollers, or a mobility device be able to easily move throughout the terminals?

Analysis and Design: If the project proceeds, we would undertake passenger modelling flows to understand boarding, exiting, and queuing in terminals to maximize ease of access for all customers, including customers with sight loss, or people traveling with bikes, strollers, or mobility devices.

18. What we heard: Will there be changes to parking availability at the base of the mountain?

Have you considered parking at this stage in the gondola planning process?

Information: If the project proceeds, parking needs would be assessed during a future stage of the project with community engagement.

19. What we heard: A key issue is how much it would cost in relation to existing transportation costs and access

What is the cost of gondola compared to bus?

Information: The capital cost of the gondola is $210 million. The operating cost of the gondola is $5.6 million annually. The project life of gondola is assumed to be 25 years. There are capital and operating expenses attributed to bus. If bus service continued, instead of gondola, the estimated capital cost of bus is $77.5 million. The annual operating cost of bus is $7.8 million. Gondola would provide a 30% savings in annual operating costs over current bus operations.

What would the Burnaby Mountain Gondola cost and who would pay for it?

Information: If the project proceeds, the Mayors' Council on Regional Transportation would determine if the Burnaby Mountain Gondola is a funding priority to be included in a future Investment Plan.

GONDOLA CABINS

20. What we heard: Prioritize seating space over standing; this immensely helps invisibly disabled people.

What would the seating inside the gondola cabins be like?

Information: Each gondola cabin can accommodate 35 people, there is room for 28 seated passengers and 7 standees. Gondola cabin interiors can be customized to suit the needs of the system. They can maximize seating capacity, focus on standing design option (e.g. grab-straps), or create a combination of the two, which is one of the more popular configurations.

Design: Design and specific features of the system would be considered later, if the decision is made to proceed with the project.

21. What we heard: Accessible access for all.

Would all the gondola cabins be accessible?

Information: Yes, all gondola cabins would be accessible.

Design: Should the project advance we would work with stakeholders from the accessibility community to better understand their needs of the gondola system and to incorporate feedback into gondola design and policy development.

Would there be features included that assist passengers with vision impairment?

Design: Gondola systems can include tactile pavement markers or auditory signaling for passengers with vision impairment. Design and specific features of the system would be considered later, if the decision is made to proceed with the project.

How is gondola accessible to passengers using mobility devices? How many mobility devices can fit in a cabin?

Information: Gondolas cabins slow down when they enter the station to allow passengers to alight and board in separate areas. The cabin floor matches the station floor elevation and the gap between the cabin and platform meets all requirements for safe boarding and exiting. If a passenger needs extra time to get on or off the cabin, an attendant would be present to offer assistance. If needed, the attendant could also slow or stop the system.

Design: If the project proceeds, we would undertake passenger modelling flows to understand boarding, exiting, and queuing in terminals to maximize ease of access for all customers, including customers with sight loss, or people traveling with bikes, strollers, or mobility devices. The number of mobility devices per cabin would depend on the interior design. Design elements of the gondola would be considered at a later date, if the decision is made to proceed with the project.

That said, if space wasn't available when a passenger with a mobility device arrived, they would only need to wait a short time before the next cabin would depart.

What happens if a person needs extra time to get on or off the cabin?

Information: Cabins slow to a walking speed in stations to allow for easy boarding and exiting. If a passenger needs extra time to get on or off the cabin, an attendant would be present to offer assistance. If needed, the attendant could also slow or stop the system.

22. What we heard: What is the exact dimensions of the gondola? What is the width of the swath they will be cutting?

What size are the gondola cabins?

Information: The exterior dimensions of the gondola cabins are approximately 3.5 metres square by 2.5 metres tall. The height from the cable to the bottom of the cabin is about 6 metres. The right-of-way for the gondola is generally 20 metres wide.

Do trees need to be removed under the gondola?

Information: Since most of the right-of-way required is aerial, ground clearing is limited to areas around infrastructure – the tower and upper terminal. The gondola will operate above the treeline at a safe separation from the trees to not impede future tree growth and as a buffer between any forest fires. Route 1 has the lowest impact to trees.

Do the cabins stay on the cable at night?

Information: When not in operation, cabins are typically removed from the line automatically and stored to reduce exposure. The cabin storage area is commonly collocated with a station or maintenance facility.

Neighbourhood

1. **What we heard: Being Forest Grove residents, my family/I are very concerned about the potential residential impact.**

Are you considering the concerns of Forest Grove residents who don't want a gondola built above their homes?

Information: Yes, we're taking all concerns and feedback seriously. The two rounds of public engagement that took place in fall 2020 each included neighbourhood specific workshops. Much of the technical work that has been done over the past several months addresses many of the concerns raised by local residents who we appreciate have different considerations than the general public.

Commitments: TransLink has made commitments to avoid increasing noise, protecting residential privacy, minimizing property impacts, compensating impacted residents, minimizing visual presence, and maximizing safety.

2. **What we heard: I would want to know in detail the extent of noise impact. I am concerned about hearing people in the cabins.**

How loud would the gondola be?

Information: The gondola is silent except when it passes over the towers. When doing so, there is a slight rumbling that is about the level of a normal conversation if you were standing on the top of the tower. The sound at ground level would be very minor (directly below the tower). Sound modelling has demonstrated that the noise from the gondola does not exceed background noise levels.

Analysis: TransLink will model in-cabin noise impacts on the Forest Grove neighbourhood.

Commitment: TransLink commits to designing a gondola system that does not exceed background noise levels in Forest Grove.

3. What we heard: Since all routes look to impact residential neighbourhoods, privacy measures need to be implemented (such as lower frosted glass, etc).

Would gondola passengers be able to see into the homes and backyards they pass over?

Information: The gondola would travel above the tree line and upwards of 60 m above homes. The height and design of the cabins for the proposed gondola to Burnaby Mountain would mitigate potential privacy concerns.

Design: Gondolas can also be equipped with features, such as blinds that would prevent passengers from seeing out at certain angles, or with tinted glass.

Commitment: TransLink will explore outfitting gondola cabins with tinting windows that will automatically block visibility into homes in the Forest Grove neighbourhood.

4. What we heard: Please do a detailed assessment of the effect on property values from a gondola near homes

What is the visibility of the gondola from homes in Forest Grove?

Analysis: Further analytical work would be conducted to better understand how local topography, tree cover, and orientation of windows influence the visibility of the gondola in the Forest Grove neighbourhood.

Commitment: TransLink is committed to assessing the visibility of the gondola and using natural topographic features and design elements to minimize the visual presence of the gondola in the Forest Grove neighbourhood.

5. What we heard: Be kind - arrange to offer compensation to folks beneath the gondola

If Route 1 is chosen, would impacted residents receive compensation?

Information: TransLink would undertake a process to acquire the necessary aerial rights to allow for the passage of the gondola. We would engage the services of an independent appraiser to determine the current market value of the property/aerial rights and work to reach an agreement with each property owner. Residents can remain in their homes and are not required to move.

Commitment: TransLink will provide compensation to the two multi-family property complexes for aerial passage of the gondola.

6. **What we heard: the gondola passing directly over residential properties could be a non-cosmetic problem if passengers can throw garbage out of the gondola cabin.**

Would the cabins have windows that open? Would people be able to throw things out the windows?

Information: Cabin windows do not open, so passengers could not throw things out the window.

7. **What we heard: Will the bright lights be an interruption to residence and neighbourhood?**

Would lighting from the gondola be bright and obvious to people below its path of travel?

Information: The gondola would incorporate interior lighting that meets the appropriate standards. Floor lighting is typically used to create a safe space in which to move, but would not be visible at ground level.

Environment

1. **What we heard: I have concerns with the environmental impacts associated with building the gondola.**

Which of the three route options would have the lowest environmental impact in the surrounding areas?

Information: Route 1 has the lowest environmental impact as it minimally intrudes in the conservation area.

2. **What we heard: Save the trees. Is there a tree replanting plan?**

Would trees need to be cut down for a gondola to be built?

Information: The gondola system was designed to operate above the tree line, with no clearing below the line for Route 1. Routes 2 and 3 would require tree clearing to accommodate the angle stations. Through the conceptual design process, gondola towers were placed in developed areas, or adjacent to roads, wherever possible to minimize tree loss. That said, some tree removal would be required for each of the routes with Route 1 having the lowest impact. We anticipate that approximately 220 trees, of which about a total of 40 are in parks and conservation areas.

Commitments: Minimizing tree removal would be a key objective if this project moves ahead, where, TransLink would adhere to Burnaby's Tree Bylaw. This bylaw sets out requirements for tree replacement. TransLink will continue to assess and mitigate potential environmental impacts of the project.

3. **What we heard: There are many spawning streams in the area, so environmental issue /fish habitat areas need to be respected. Impact to the Stoney Creek waterway must be avoided during construction.**

Would riparian areas and fish-bearing streams be impacted by the gondola?

Information: Minimizing environmental impacts will be a key objective if this project moves ahead. The Stoney Creek Environment Committee (Stoney Creek and Eagle Creek Streamkeepers) was consulted in initial planning, and will be participating in this consultation. Some intrusion into the stream setbacks will be required for Routes 2 and 3. Route 1 would not impact stream setbacks.

Analysis and design: Further environmental work and design refinements would be done to mitigate environmental impacts that could be associated with the construction of a gondola.

Commitment: TransLink will continue to assess and mitigate potential environmental impacts of the project.

4. **What we heard: I am concerned about the impact of building and maintaining gondola towers on wildlife and ecology on the ground, especially on Burnaby Mountain Conservation Area**

How much impact would there be to the Burnaby Mountain Conservation Area (BMCA) during construction and operation?

Information: In the conceptual design phase, TransLink tried to limit the impact to the conservation area and parks by locating infrastructure in developed areas or road right-of-ways. Route 1 has one tower (located in the Gaglardi road right-of-way) that partially extends into the BMCA. Due to the nature of the angled alignments, we were not able to avoid placing infrastructure in the conservation area or parks. Route 2 and 3 would have angle stations and towers located in the BMCA and Naheeno Park. This infrastructure would require land disturbance, tree clearing, overlap with the BMCA area, and would possibly infringe on waterways and riparian setbacks. Access roads would be required to construct and maintain the angle stations and towers. These roads could be built out of gravel and would not necessarily need to be asphalt or concrete in order to minimize further impacts.

Commitment: TransLink will seek to minimize construction related environmental impacts.

5. What we heard: Are you doing an environmental assessment of gondola?

Will this project be subject to an environmental assessment process?

Information: TransLink is committed to minimizing the environmental impact of the proposed project. Should the project proceed, the gondola would be designed and constructed in compliance with relevant federal, provincial, and municipal environmental regulations and policies, including an environmental assessment, if required.

TransLink's typical practice is to study the potential effects of the project's construction and operation, and implement mitigation measures, as required. These studies would be completed concurrent with a decision to implement the project.

What are the GHG benefits of the gondola?

How much would the Burnaby Mountain Gondola offset GHGs?

Information: A Burnaby Mountain gondola would reduce GHG emissions from trips made by bus and vehicles. The GHG emission reductions from bus are considered short-term savings as TransLink moves to transition its fleet to battery electric buses. The GHG emissions reductions from vehicles are long-term savings.

- Buses CO_2e reductions from replacement with gondola: –3,700 tonnes CO_2e
- Vehicles CO_2e reductions: Route 1: –1,400 tonnes, Route 2: –1,300 tonnes, Route 3: –800 tonnes

Indigenous Cultural Resources

1. **What we heard: What has consultation with the Indigenous communities been like? Are they aware of some of the local concerns?**

Information: During the planning phase of the gondola project, TransLink engaged potentially affected Indigenous Nations, in particular, kʷikʷəƛ̓ə m (**Kwikwetlem**), xʷməθkʷəy̓ə m (**Musqueam**), Sḵwx̱w̱ ú7mesh Úxwumixw (**Squamish**), səlilwətaɬ (**Tsleil-Waututh**) to understand their rights and interests in the project area and obtain their input on the evaluation of route options. Interests and priorities identified by Indigenous Nations during engagement related primarily to protection and enhancement of cultural, archaeological and environmental values, the cumulative effects of development, and climate change.

Indigenous Nations participated in a preliminary field reconnaissance to identify potential archaeological values in the project area. Of those Indigenous Nations that identified a preferred route, Route 1 was identified as the preferred option. Reasons included the fact that Route 1 provides the greatest GHG reduction benefits and the lowest environmental and land disturbance impacts, including requiring no access roads and fewer structures. TransLink has incorporated this feedback into the evaluation of route options.

Commitments: TransLink will commit to conducting an Archaeological Impact Assessment (AIA) for ground disturbing activities in areas identified as AIA required. TransLink will ensure that all crews conducting ground disturbing activities within any portion of the project area receive Chance Find Training and a project specific *Chance Find Procedure*. TransLink will continue to engage with the Indigenous Nations to better understand areas of current and traditional cultural importance.

Appendix 2

Phase One Stakeholder and Public Engagement Summary Report

Appendix 3

Phase Two Stakeholder and Public Engagement Summary Report

Appendix 4

Preliminary Route Evaluation Report

HEAD OFFICE:
400-287 Nelson's Court
New Westminster, BC
V3L 0E7 Canada

TRANSLINK

translink.ca