



Garibaldi Resort Transportation Concept

*Prepared for
Garibaldi Resort Management Company*

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FEHR  PEERS

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Introduction

The purpose of the Garibaldi Resort Transportation Concept is to identify transportation strategies and measures that manage the traffic demand generated by the resort both within the resort village and on the regional transportation network. This Transportation Concept is intended to be the first step in the development of a Transportation Plan that will require approval by the Ministry of Transportation and Infrastructure (MOTI). This Transportation Concept has been informed by the “Garibaldi at Squamish Traffic & Safety Impact Assessment” prepared by Bunt & Associates in 2014, and draws upon this report as part of evaluating effective transportation demand management strategies for the existing and planned regional transportation network supporting the Garibaldi Resort. Updates to the Traffic & Safety Impact Assessment will be part of the subsequent Transportation Plan development process.

The transportation strategies outlined in this Transportation Concept are intended to create a resort environment that is forward looking, ecologically minded and highly accessible. The Garibaldi Resort will generate additional travel demand along the Sea-to-Sky Highway. Many strategies considered in this Transportation Concept balance reducing traffic impacts with the goal of ensuring that the resort is simultaneously accessible and environmentally responsible.

This document provides background context about the Garibaldi Resort and its traffic impacts (as forecast by the 2014 report by Bunt & Associates), outlines various transportation demand management strategies that could be employed to reduce these impacts and improve the resort’s multimodal accessibility, and concludes with a discussion of next steps. This report looks at three time periods for the Garibaldi Resort. Descriptions of the envisioned transportation context and available transportation options in place during each time period are summarized below and described in more detail throughout this document.

Opening Day

The transportation vision for opening day is that visitors will be able to ride private buses to and from a central hub within the resort, and that those who opt to drive will be able to park once and use active transportation, electric micro transit and electric buses to get around the resort easily.

Near-Term

In addition to encouraging a park-once mentality within the resort and having robust bus service to and from the resort, the near term transportation vision will allow visitors to park at one of multiple central transportation hubs in the Lower Mainland and ride either directly to the resort or to a gondola that will take them in.

Long-Term

The long-term vision is that visitors will have diverse methods to arrive at the resort, including rail, bus and ferry services supported by central transportation hubs in the Lower Mainland. Additionally, visitors will have the option of using a gondola, active transportation, electric buses, and micro transit to navigate within the resort and to get from the resort to the highway. The resort's transportation network is built to accommodate future technologies, especially as it relates to connected and autonomous vehicles.

About Fehr & Peers

This Transportation Concept is a collaborative effort of the Garibaldi Resort Management Company team and Fehr & Peers. Established in 1985, Fehr & Peers has 35 years of experience partnering with communities to shape local transportation futures. With offices throughout the US, Fehr & Peers is among the largest firms in the world specializing exclusively in transportation planning and engineering. Their core services include multimodal transportation planning, transit planning, transportation engineering, bicycle and pedestrian planning, travel modeling and forecasting, freight and goods movement, safety analysis, transportation demand management, emerging transportation technologies, sustainable transportation, and transportation equity. Fehr & Peers has worked with multiple resorts throughout North America to evaluate effective options to improve transportation efficiency and overall user experience.



Garibaldi Resort Context

Background

The Garibaldi at Squamish Resort on Brohm Ridge is approximately 13 kilometers (km) north of downtown Squamish, BC. The mountain resort development will offer recreational activities during all seasons, including 130 ski and snowboard trails, 21 aerial lifts, a network of multi-use trails, a variety of other multi-season recreation offerings, and 3 on-mountain guest service buildings. The mountain recreation will be staged from two main base area portals (the Village Portal and the South Portal) as well as a smaller North Portal for guests at local accommodations in the northwest corner of the resort.

The main entrance to the resort would be located south of Brohm Lake, along the Sea-to-Sky Highway #99. The Sea-to-Sky Highway is a major regional route that spans several hundred kilometers connecting the US border to Historic Hat Creek, traversing some of the most scenic mountain terrain in the province. The Sea-to-Sky Highway connects the Garibaldi resort with the District of Squamish, the most proximate community, as well as the Vancouver Metro area (to the south) and the Resort Municipality of Whistler (to the north). Immediately adjacent to the proposed resort, the Sea-to-Sky Highway has three lanes. South of the resort access to Squamish, there are two northbound lanes and one southbound lane. To the north, the highway transitions to one lane northbound and two lanes southbound. There are private bus services that run between Vancouver and Whistler, which include SkyLynx and Snowbus, and the District of Squamish has a robust local transit system. Combined, these transportation resources provide a strong mobility foundation for the future resort.

The arrangement of the development at the resort is envisioned to be compact, mostly occurring in clusters adjacent to the main access road, ski trails and multi-use trails. Guest services would be located at each of the three main portals, each centrally located relative to neighboring developments. This compact,

mixed-use layout would locate all public bed units and over three-quarters of the private bed units within walking distance of services and recreational amenities. In addition, most of the visitor accommodation would be located with ski-to-ski-from access in relation to lifts and services.

At full build out, this resort is expected to have a comfortable carrying capacity of 15,250 skiers/riders, with non-alpine skier offerings supporting 14,000 guests in the summer. This would equate to an annual skier visitor count of approximately 995,000, with an average daily demand of 7,000 visitors during the peak winter season and additional visitors during the summer.

Trip Generation

Mountain resorts are unique activity generators, with peak demand highly dependent on snow conditions, composition of local/regional and destination skiers and population/employment characteristics. Therefore, there are no comparable sites which could be studied to estimate the traffic generation from the Garibaldi site. Consequently, Bunt & Associates based their assumptions to forecast traffic generation of the Garibaldi Resort on the following sources:

- Estimated Resort Accommodation, Bed Unit and Comfortable Carrying Capacity data provided to Bunt by the Garibaldi Project Team in November 2014
- Peak Accommodation Occupancy data, Skier Yield information and Skier Demand pattern data, which was assumed to be similar to Whistler's as reported in the Whistler Mountain Master Plan, 2010 by Ecosign Mountain Resort Planners and confirmed by the Garibaldi Project Team as reasonable for planning purposes
- February Peak and Average skier demand pattern data, assumed to be like that for Whistler/Blackcomb
- Distribution of Skiers by Travel Market: Day, Weekend, Multi-day based on Bunt's engineering judgement, informed by data provided by the Garibaldi Project Team and similar travel market information collected during a comprehensive data collection program in 1998 in Whistler
- Garibaldi employment estimates, labor participation rates and employee residence location, based on Bunt's judgement and direction provided by the Garibaldi Project Team
- Mode Split and Occupancy data by Travel Market, which was assumed to be consistent with similar information collected during a comprehensive data collection program in 1998 in Whistler.¹ provided to support the high percentage of skiers and commuters anticipated to travel between these two activity centers

¹ Note that as part of the Mode Split step, it was assumed that existing transit service providers in the Highway 99 corridor would respond to the anticipated new demand by providing more frequent services and also that a new transit service between Squamish and the resort would be provided to support the high percentage of skiers and commuters anticipated to travel between these two activity centers.)

- Vehicle trip distribution by Travel Market based on Bunt’s knowledge of the corridor, engineering judgement and informed by previous forecasted population distribution to communities through the corridor.

Table 1 summarizes the total forecasted vehicle trips generated by the Garibaldi Resort at full build-out. ***It is important to note that the Bunt 2014 forecast does not consider any of the travel demand management strategies outlined in this Transportation Concept.***

Table 1: Garibaldi Resort Forecasted Trip Generation

Direction	Time Period									
	Average Day					Typical Peak February Day				
	Friday	Friday AM	Friday PM	Sunday	Sunday PM	Friday	Friday AM	Friday PM	Sunday	Sunday PM
Entering	2130	207	293	1836	101	2601	258	363	2387	115
Exiting	1441	74	194	2664	378	1682	80	233	3357	489
Total	3571	281	487	4500	479	4283	338	596	5744	604

Anticipated Traffic Impacts

The 2014 Traffic & Safety Impact Assessment of the Garibaldi resort considered how forecasted new trips from the resort were likely to impact traffic operations along the Sea-to-Sky Highway over time. At buildout, it was assumed that the impacts of the resort development on Sea-to-Sky Highway north of the resort would be quite modest, as trips from Garibaldi would comprise only 1-4% of daily traffic (two-way) volumes and up to 8% of peak hour traffic (two-way) volumes. South of the Garibaldi development, more significant traffic impacts were forecast at buildout. In the section of Sea-to-Sky Highway between Depot Road in Squamish and the resort access, with daily/peak hour volumes were forecast to increase by 25-50% depending on the time period. South of Squamish, the resort development is expected to add 12-17% to daily traffic overall and 15-25% to peak hour traffic by project buildout.

With this context in mind, the following chapter outlines strategies to reduce the resort’s traffic impacts on the Sea-to-Sky Highway with the goal of ensuring that the resort is simultaneously accessible and environmentally responsible.



Transportation Demand Management Strategies

The goal of Transportation Demand Management (TDM) is defined by the Victoria Transport Policy Institute, a global leader in transportation research and policy development, as “strategies that result in more efficient use of transportation resources”². This could be done by disincentivizing inefficient travel behaviors, such as low-occupancy vehicle travel and excessive auto trip making, through strategies such as implementing paid parking or tolls. This could also be done by incentivizing efficient travel behaviors, such as carpooling or taking transit, through strategies such as implementing effective transit service (possibly including electric/autonomous technologies), creating carpool infrastructure or incentives, parking reservation/live updates, comfortable pedestrian/bicycle infrastructure, employee shuttles/guaranteed ride home, etc.

This chapter will discuss the TDM strategies that could be implemented to mitigate the traffic impacts of the resort and meet the resort’s goal of being simultaneously accessible and environmentally responsible. These measures have been divided up by timeline, starting with those measures that could be implemented by opening day, followed by those that could be implemented in the near-term. Long-term considerations are also identified. The cost of strategies outlined in this Transportation Concept are represented qualitatively on a scale from low to high, as demonstrated in Figure 1. Costs considered include both upfront capital costs, as well as ongoing implementation and maintenance. Figure 2 shows a similar scale used to score the environmental effectiveness of each measure. Environmental effectiveness is measured qualitatively based on a measure’s ability to reduce overall driving, including the number of vehicle trips, the length of these trips, or the number of trips that are made during congested times.

² Victoria Transport Policy Institute, “Online TDM Encyclopedia”.

Figure 1: Transportation Demand Management Strategy Cost Scale

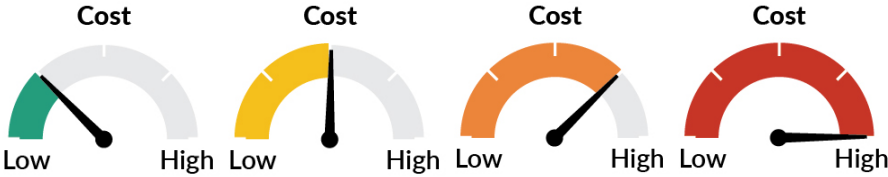


Figure 2: Transportation Demand Management Strategy Environmental Effectiveness Scale



Opening Day Measures

This section discusses measures that will be available at opening day of the resort. The transportation vision for opening day is that visitors will be able to ride private buses to and from a central hub within the resort, and that those who opt to drive will be able to park once and use active transportation, electric micro transit and electric buses to get around the resort easily. The following measures are envisioned to be implemented by opening day:

- *Robust Data Management/Data Collection*
- *Dynamic Messaging/Wayfinding Apps*
- *Tiered Lift Ticket with Transportation/Parking Bundles*
- *Robust Bus Service from Lower Mainland*
- *Park & Rides Serving the Resort*
- *Partnerships with Ride-Share/Ride-Hailing/Taxi Companies*
- *Electric Buses Internal to Resort*
- *Electric Micro Transit Internal to Resort*
- *Electric Micro Transportation Network*
- *Central Transportation Hub and on-Mountain Equipment Storage Internal to Resort*
- *Dynamic Paid Parking Pricing*

There are a variety of reasons why these measures are proposed for implementation on opening day. Some of the measures are considered resort features or essential to meet the immediate needs of Phase 1 of the resort. Others require that infrastructure be put in place as early as possible to be the most efficient. In the end, all opening day measures were selected after considering the environmental and accessibility goals of Garibaldi. These measures are described in the following sections, including a discussion of mode share, cost, and implementation/design considerations.

Robust Data Management/Data Collection

Robust data management and collection entails collecting data on various key indicators that can inform Garibaldi resort on transportation usage, mode split and statistics. This would include infrastructure to dynamically monitor parking within any park & rides that service the resort (whether at the resort, the highway access or in the Lower Mainland) and to dynamically monitor traffic along the Sea-to-Sky Highway. Other important indicators that could be monitored would be the number of visitors on a given day, number of transit/micro transit users, etc. The data from this monitoring could be used to evaluate how different transportation strategies are performing and guide adjusting strategies as needed. It could also be integrated into dynamic wayfinding apps to help visitors with trip and parking planning and costs.

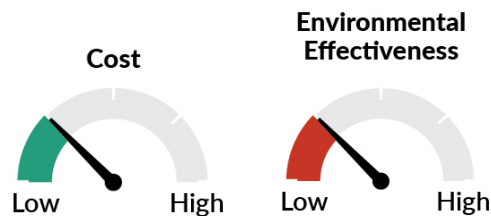
Dynamic traffic and parking monitoring, when used in conjunction with dynamic wayfinding apps available to visitors, can lower congestion on roadways by encouraging users to use an alternate mode to arrive at the resort, by helping visitors that arrive by car to find parking more quickly, and encouraging users to stagger their trips to non-peak travel times. For this measure to effectively aid in increasing the

transit mode share, it would be important that dynamic monitoring of transit travel times also be performed (particularly for regional connections to the resort).

Implementation Considerations

For this measure to be successful, it is essential to identify key metrics to collect and where data monitoring stations should be placed to evaluate the transportation conditions most effectively at and near the resort. Locations for data monitoring could include along the Sea-To-Sky Highway, at park & rides servicing the resort, and within the resort itself. Considering what monitoring product and data analytics applications will be used to analyze and present the collected data is also important. This analytic software should allow the data to be usable in dynamic wayfinding apps, as well as in dynamic messaging. These will be discussed in more detail as a subsequent measure.

In terms of costs, dynamic monitoring would entail an up-front cost for installation of traffic monitoring tools and development of data analytics software. Additional operations and maintenance costs would also occur annually. However, the up-front capital infrastructure investment and subsequent annual costs are small relative to other measures that require investment in more extensive physical infrastructure. Additionally, dynamic monitoring and data management will not have any direct impact on emissions or Vehicle Kilometers Traveled (VKT) without being supplemented by other measures.



Dynamic Messaging/Wayfinding Apps

Dynamic messaging and/or wayfinding apps create an opportunity to provide a friendly and hassle-free interface between visitors and transportation/other services integrated into the resort. Dynamic messaging would include electronic signs at park & rides or transportation hubs related to the resort, as well as along the Sea-to-Sky Highway, that provide dynamic travel time and parking information. Dynamic wayfinding apps could allow users to have access to various services including transportation incentives (such as discounts/promotions for transit or carpool/rideshare use), rideshare capabilities, live traffic/parking monitoring tied with trip-planning infrastructure, etc. These apps could also tie into the lift ticket purchased by the user, making it easier to have access to lifts, lodging or other amenities, and to access transportation/other services specific to whatever lift tier they purchased (see discussion on the “Tiered Lift Ticket with Transportation/Parking Bundles” measure).

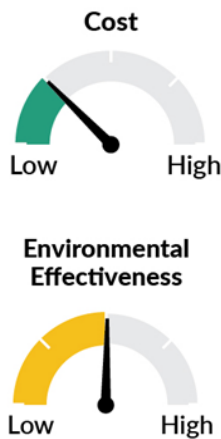
Dynamic wayfinding apps present an opportunity to advertise the variety of methods to travel to and within the resort. Effective messaging of these different modes, paired with dynamic information on travel

times for various modes and parking availability, can have a large impact in distributing the use of modes and encouraging visitors to opt for an alternative to driving.

Implementation Considerations

Dynamic messaging signs along the Sea-to-Sky Highway and other public locations will likely require coordination with public agencies. In the case of developing a dynamic wayfinding app, it is important to consider that most visitors to the resort will have extensive experience interacting with various web and mobile applications. They will expect a certain level of quality from any wayfinding app they use, and this expectation of quality will shift and evolve as technology does. In order for Garibaldi to ensure the positive transportation demand benefits associated with a dynamic wayfinding app, it will be important to ensure that significant attention and investment be made continuously over the lifetime of the app. Careful consideration of what firm should develop and maintain the app will be a necessary part of this.

Both dynamic messaging signs and a dynamic wayfinding app will require initial investment to construct the physical and digital infrastructure necessary to make these investments effective. A smaller investment annually will be needed to maintain the dynamic messaging infrastructure. However, more significant annual investment will be required to maintain and update the digital infrastructure of the dynamic wayfinding app. In terms of environmental effectiveness, dynamic messaging and wayfinding apps will allow drivers to monitor live traffic conditions and make decisions that will lower the overall VKT and vehicle emissions on the Sea-to-Sky Highway.



Source: Flickr, SDOT Photos

Tiered Lift Ticket with Transportation/Parking Bundles

Lift tickets indicate that a skier has paid and can ride on the ski lifts. Garibaldi Resort can utilize a similar system to allow customers to access the lifts in both winter and summer. A tiered lift ticket system could allow different options to be bundled with the lift ticket, including parking, transit passes, micro transit,

etc. These bundles would be facilitated by dynamic wayfinding apps (discussed previously) and would allow for potential financial incentives and discounts for people who bundle their lift tickets with specific transportation options.

Tiered lift tickets would allow different transportation or parking options to be advertised and incentivized, potentially allowing Garibaldi Resort to incentivize using specific modes over driving during peak days and seasons.

Implementation/Design Considerations

To ensure the success of bundling transportation with a Garibaldi Resort tiered lift ticket, these bundles should be planned out and established from the beginning. These options would likely include different parking or transit options, and it will be important to balance the cost of each bundle logically to ensure that each charge to the visitor is well considered and leaves visitors feeling like they have choices and receive value from the bundle they purchase. This presents an opportunity to provide incentives to different modal options and steer visitors in a way that both meets the transportation goals of the resort and leaves visitors satisfied

Including transportation/parking bundles in a tiered lift ticket does not cost anything so long as they are incorporated from the beginning. This measure also does not have any direct environmental impact on its own.³

Robust Bus Service from Lower Mainland

Multiple private coach services already exist between Whistler and the Lower Mainland, such as YVR Skylynx or Snowbus. Garibaldi Resort could partner with some of these existing services, in addition to sponsoring their own service. These private coach services to the resort would provide direct connection to the central village transit drop-off from various communities in the Lower Mainland, incorporating periodic pick-up and drop-off areas along the Sea-to-Sky Highway to serve various communities between Vancouver and the resort. It would be important to ensure that these buses are comfortable, affordable, and operate at regular headways to ensure that the services are as attractive as possible. Though potentially infeasible at opening year, public-sponsored bus service between Squamish or the Lower Mainland and the Garibaldi Resort could be a powerful supplement to these private coach services.

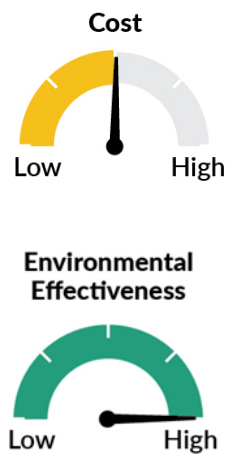
Efficient regional bus service would provide an appealing alternative to driving to the resort, particularly for those travelling from the Lower Mainland or the Vancouver airport to the Garibaldi Resort. By bundling these private (or potentially public) services with tiered lift tickets, integrating the services with dynamic wayfinding apps and other such incentives, these more regional bus services could carry a substantial share of visitors to and from the resort.

³ The cost and environmental effectiveness scores are N/A, as this measure is more of an ongoing program

Implementation/Design Considerations

It is anticipated that by opening year, public transportation tying into the private coach services will not yet be available, as this will take time to coordinate. the Garibaldi Resort will need to coordinate for extensive contracting of private coach services to ensure a robust bus system connecting to the resort. These services would tie into any park & rides servicing the resort, in addition to other major stops that would service both employees and visitors. Any private coach services that use public facilities for pick up would need to be coordinated with the municipality in question.

Many private coach services will charge an hourly fee per bus. It would be essential to study and understand the proportion of visitors that would use the private bus service, and where these visitors would likely originate. Efficient planning of the bus service would ensure a positive perception of the service, in addition to more effective use of the funds. Additionally, regional bus service would have a small positive impact on VKT and vehicle emissions by carrying visitors that would otherwise drive.



Source: Fehr & Peers

Local Park & Ride Serving the Resort

Park & rides serve as transportation hubs that allow visitors to drive, park and then ride available transit options, ride hailing services, or other available modes. These generally feature large parking lots or structures; effective circulation and pick-up drop off zones that allow for a seamless transition from the car to other modes. At opening day, the Garibaldi Resort could feature a park & ride at the highway access to the resort village and could have bus connections from the park & ride to a central transit drop off in the village.

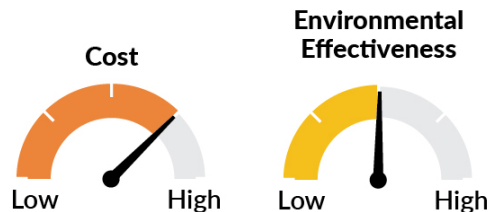
Park & rides provide a transportation hub where several modes can meet. By incentivizing the use of park & rides through dynamic parking pricing within the resort complex, effective transit options, and dynamic

wayfinding, this can become an effective measure to encourage the use of other modes rather than driving.

Implementation/Design Considerations

It is anticipated that the Garibaldi Resort would need multiple park & rides and hubs for the robust bus service and other alternative modes to effectively service the resort.

The cost of constructing the park & ride varies based on a variety of factors, including the number of needed parking spaces, the location and cost of land, the feasibility of constructing the facility, and whether it would be a surface lot or parking garage, etc. A parking garage will cost substantially more than a surface lot in many locations; likewise constructing a large park & ride in Vancouver will cost more than constructing one of a similar size in Squamish or near the highway access. The Garibaldi Resort may have the opportunity to coordinate with retail or others to use existing parking lots for more localized park & rides outside of the highway access to the resort and any other transportation hubs that the resort invests in. This would mitigate the cost of constructing park & rides. Additionally, park & rides provide a central hub for people to transfer from one mode to another and could help in the mitigation of vehicle emissions and VKT by allowing people to transfer for single occupancy vehicles to transit or other consolidated modes.



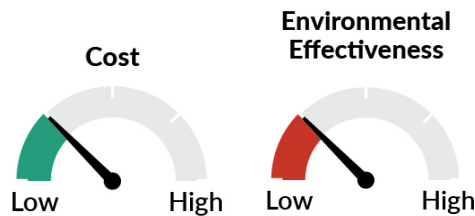
Partnerships with Ride-share/Ride-Hailing/Taxi Companies

Ride-share/ride-hailing companies, such as Modo, Evo, Uber, or Lyft, have become an important part of the transportation system in the Lower Mainland. This is in addition to existing taxi companies that service the Lower Mainland. Because car ownership is lower in urban Vancouver and the surrounding areas, some travelers opt to use these services to get around. Ride-share/ride-hailing services allow users to book and pay for corner-to-corner rides using a smartphone app. Taxi companies provide a similar service. It will be important to ensure that any robust bus system and park & ride service connected with the Garibaldi Resort integrate these ride-share/ride-hailing/taxi services to help eliminate that step between the personal vehicle and the resort transportation services. Integrating this service may help reduce the number of parked cars, and thus the number of parking stalls, at each park & ride.

Implementation Considerations

This measure will require direct coordination with private ride-share/ride-hailing companies, as well as with local taxi companies, to ensure that routes and infrastructure are put in place to make the pick-up and drop-off of visitors at park & rides occur seamlessly. Additionally, it will be important to consider physical infrastructure within the resort such as pick-up/drop-off areas and proper circulation planning be in place so that those utilizing this service will not interrupt the flow of other private vehicles or the resort bus services.

In considering cost, coordinating with these companies would likely be low cost. Much of the cost would come from any physical infrastructure that would need to be constructed to accommodate ride-share/ride-hailing/taxi services. However, it is important to note that, although these services could help in reducing parking demand, the overall impact on VKT and vehicle emissions is unclear, as these ride-share/ride-hailing/taxi services often do not reduce the number of vehicle trips being taken to park & rides, and may even increase vehicle travel by providing a convenient alternative to transit.



Electric Buses Internal to Resort

Battery electric buses are zero emission vehicles that are being implemented in various resort communities throughout North America. These buses provide efficient short-range service and have a low environmental footprint. Within Garibaldi, these buses could provide interconnected service between the three main bases and could also provide service to and from park & rides at the highway access.

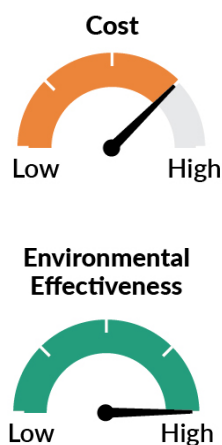
Having an efficient and attractive bus system internal to the resort would increase the internal capture of skiers who would otherwise drive within the resort proper. In conjunction with paid parking and other disincentives, implementation of this bus system would lower vehicle traffic internal to the resort substantially.

Implementation/Design Considerations

To ensure efficient use of the bus service, it would be important to select where transit hubs and major bus stops will be and planning what visitor capacity the buses would serve. Additionally, this bus service would need to be integrated with data management services to ensure proper data collection and coordination with lift ticket bundles and other services. Parking, staging, and yard operations for all buses

would need to be planned appropriately, including coordination for bus charging. Roadways and intersections at the resort would need to be designed to accommodate the largest size of bus planned for the service, and proper permitting for each bus would need to be obtained.

Battery Electric Bus vehicles have a large up-front cost, which includes battery leasing and charging infrastructure. This cost would be coupled with annual operation and maintenance costs which include the cost of drivers and data management services. Proper planning of the bus service would be essential to keep the costs of the service down while ensuring a positive visitor experience. As this bus system will be fully electric, it will also have a large positive impact in reduced vehicle emissions, in addition to reducing VKT internal to the resort.



Electric Micro Transit Internal to Resort

An electric micro transit system would provide an on-demand, app-based door-to-door carrier service internal to the resort. Many such services are run by private vendors that own and maintain the vehicles, in addition to hiring and training the drivers. Typically, these vehicles have 5-7 forward facing seats and operate like a typical private roadway vehicle. Within the Garibaldi Resort this could be an efficient way to connect the three major bases of the resort, providing on-demand service to skiers within the resort.

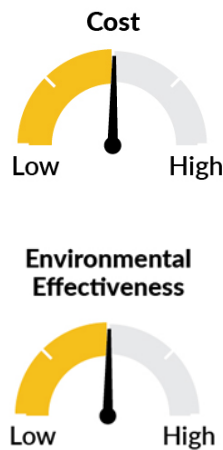
Electric micro transit would provide an alternative to the electric bus service that would be more adaptable. This adaptable nature would allow the micro transit service to capture users that would typically choose driving over riding the bus service. However, because these vehicles are smaller and the service is not route-based, it would not operate effectively as a replacement for bus service and would instead be a supplement to it.

Implementation Considerations

Micro transit services are most often contracted to private vendors that integrate their services into wayfinding apps. This could be done using any dynamic wayfinding apps that the Garibaldi Service would

use. Promotion of the service on websites, social media, and apps would be essential to ensure its success. It is also important that any micro transit services provided by the resort not compete with other local cab or transit service, and instead be a transportation supplement internal to the resort. Though convenient, this service is age limited, as legal restraints requiring car seats and other safety precautions make it so children below a certain age cannot ride.

Micro transit services tend to be an annual cost, as maintenance and operations are usually the responsibility of the private vendor. Though not low-cost, micro transit services tend to cost less and provide more limited service than that of more robust transit systems. As these services will be fully electric, they will also have a small positive impact in reducing vehicle emissions, in addition to reducing VKT internal to the resort.



Source: *The Aspen Times*

Electric Micro Transportation Network

Bikeshare and scooter share services are becoming more popular in many communities throughout North America, including several resort communities. These services typically provide electric bikes or scooters to users for short trips at a fee per trip or a fee per distance. Garibaldi is considering different such micro transportation options, including E-bikes, E-scooters, and E-carts (electric golf carts). Many of these options would only be feasible during the summer season but would provide visitors an attractive alternative to transit or driving while navigating within the Garibaldi Resort. This service would entail having docking stations in the three major bases for the resort and integrating the micro transportation services into dynamic wayfinding apps to ensure ease of use and to incentivize active transportation uses such as biking and hiking. A micro transportation pass could also be a potential bundle option for the tiered lift tickets.

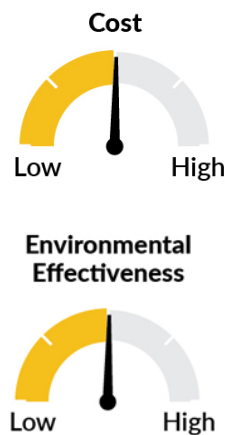
An effective micro transportation network would meet the first and last mile needs of many visitors, particularly during the summer months. E-bike, E-scooter, and E-carts would capture many users that

would otherwise drive or use transit within the Garibaldi Resort, as these more active modes provide more flexibility to users travelling at short distances. However, these micro transportation options would likely be constrained to more short distance trips, and many longer distance trips would still be taken via driving or riding transit.

Implementation/Design Considerations

The exact cost and implementation requirements of micro transportation systems within Garibaldi will depend on the service in question. Docking locations/parking stations for E-bike, E-scooter, and E-cart would need to be strategically placed at each major base of the resort based on anticipated demand, available trails, etc. An additional micro transportation hub could be constructed at the park & ride at the highway access to the resort, providing a more personalized transportation alternative to summer visitors. The Garibaldi Resort would need to create a plan for storing/repurposing micro transportation infrastructure during the winter months and would need to employ multiple mechanics to service all micro transportation vehicles.

A micro transportation system of any type would require a large capital investment up front for vehicles and docking and charging infrastructure, as well as integration into dynamic wayfinding apps. Smaller annual maintenance and operations costs would also be entailed in the services provided. As these micro transportation services would be fully electric and mostly active modes, they would reduce vehicle emissions by encouraging people to be active instead of driving.



Source: Flickr, SounderBruce

Central Transportation Hub and on-Mountain Equipment Storage Internal to Resort

Having an efficient and well-considered village transportation design is an essential part of ensuring the success of Garibaldi. A large aspect of this is a central transit drop off area that serves as a transportation hub for each base of the village. This central transit drop-off would serve as an effective location for on-site lockers/valet service, public/private bus drop off, micro transit, and ride hailing. The goal of a central

transportation hub such as this would be to ensure that guests have a seamless transportation experience on route to the resort, and that this seamless and hassle-free experience continues once they have arrived. Providing seasons pass holders with on-mountain gear storage for skis and poles in the winter, or bikes in the summer, means that visitors do not have to transport their equipment to and from the resort, making the prospect of taking a regional bus service more feasible. Having a transportation hub at each major base of the resort would minimize the number of trips that would need to be made internal to the resort, as visitors would be able to have easy access to most amenities via these central hubs.

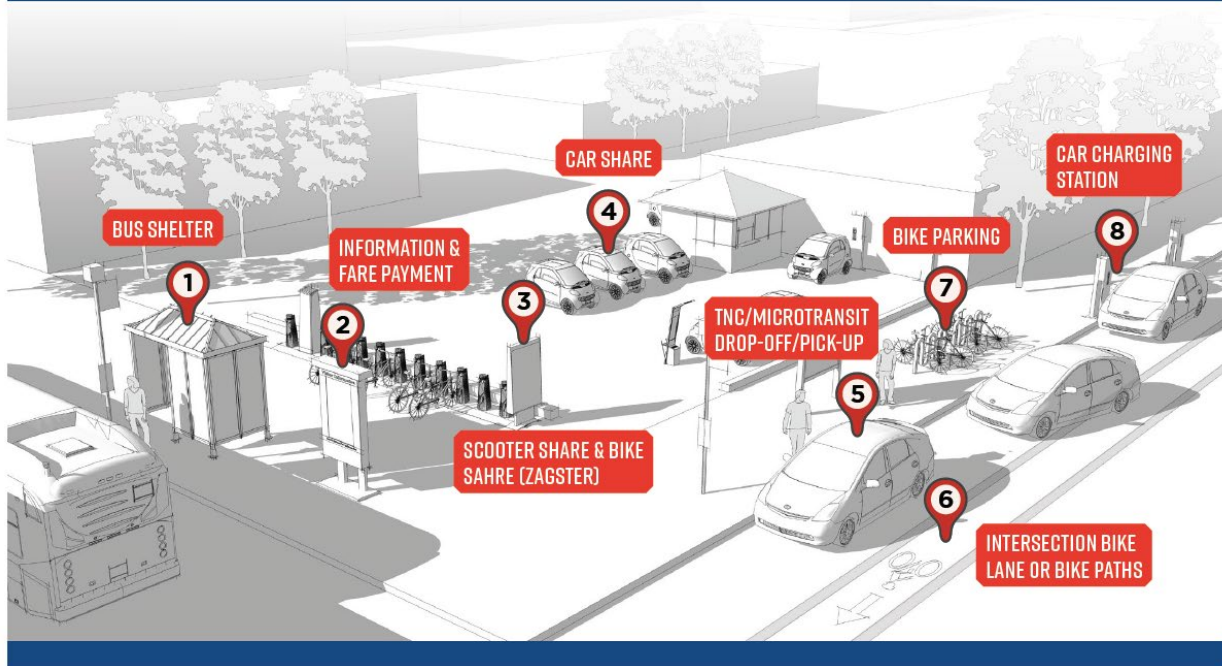
Central transportation hubs integrate various modes in one location. A central transportation hub at Garibaldi could include infrastructure for micro transportation such as E-bikes and E-scooters, micro transit, public/private bus, and ride hailing services, in addition to other active transportation options. Bringing these different modes into one location in an effective and seamless way allows visitors to feel comfortable transitioning from one mode to another, encouraging other modes over driving.

Implementation/Design Considerations

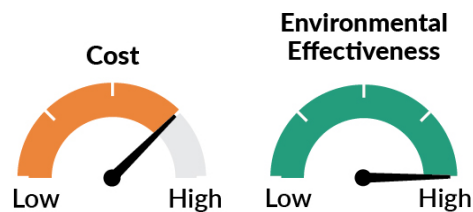
A central transportation hub would require foresight during the planning stage of the resort to ensure effective planning of the different bases. This transportation hub would also need to be designed to accommodate the various modes of transportation it would serve, including private coach/buses, cars, micro transit, micro transportation, and foot traffic. This would entail designing the roadway of the transportation hub with proper width for a variety of vehicle sizes, providing safe integration of non-motorized and motorized modes, providing docking stations for electric micro transportation, and ensuring that valet services are clearly marked and integrated with transportation services.

The design and construction of the central transportation hub would present a large up-front cost, as extensive construction would need to occur to provide the physical infrastructure for the transportation hub, any transit/transportation tie-ins, and parking. Additional maintenance costs would occur regularly to ensure the hub remains up-to-date, comfortable, and safe. By having all modes of transportation gathered in one place, central transportation hubs have the potential to be highly effective in reducing vehicle emissions and VKT. If created and operated in partnership with other municipalities along Highway 99, for instance the District of Squamish and the Resort Municipality of Whistler, a centralized transportation hub could also provide and support transportation services to support non-ski commuters. For example, people living in Whistler and Squamish who work or study in Vancouver.

Shared Mobility Hub



Source: Fehr & Peers rendering for a Shared Mobility Hub in Fort Collins, CO



Valet Service at Village Transportation Hub

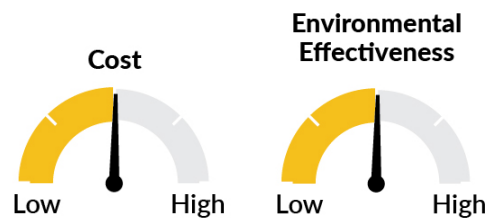
This valet service would provide a central check-in at the Village for guests arriving by coach, or by shuttle from the highway park & rides. Luggage and gear would then be transferred from this central valet directly to guest accommodations. One possibility for day visitors is to locate a valet center at the main lift access points in the village so that day visitors can store their equipment in locker and take advantage of transportation options between lifts.

This valet service would be an aspect of efficient resort design, supplementing a central transit/drop off hub by creating hassle-free and seamless services for both day users and overnight visitors. On its own it likely would not impact mode share, but as a supplement to other effective design choices within the resort, this service would likely remove extra trips that would otherwise occur between lodging and the main lift access points.

Implementation/Design Considerations

Valet services within the resorts and at any transportation hub external to the resort would be able to provide short and long-term storage, such as basic self-storage and more robust 'valet' service that drops items at the visitors' destination. This service could also include equipment servicing. As such, any valet service would require many employees to ensure the system runs efficiently. Additional inventory management and interoperability between the valet service and lounges/clubs would need to be planned efficiently to ensure the success of any service.

The cost of a valet service is purely labor and is thus ambiguous. However, the cost would be annual, and would likely increase as the number of visitors and demand for the service increase. This service would also have some effectiveness in removing vehicles from the road by providing visitors a seamless way to store and move their belongings, reducing the number of trips these visitors need to take.



Dynamic Paid Parking Pricing

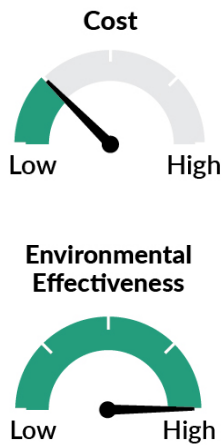
Especially during peak visitation periods, parking demand can exceed what is supplied in resort communities. Dynamic or peak parking pricing is an effective method to mitigate this. By making parking paid, this creates a disincentive for visitors to park at the resort, and encourages them to either park their car at a park & ride more distant from the resort and ride in, or take a regional transit service from the Lower Mainland. This parking pricing can be adjusted based on peak demand (i.e. higher parking pricing during peak days/peak times of day in the winter/summer, lower parking pricing in off-peak seasons or times). Parking pricing could also be lowered/nullified in the case of carpool/rideshare, although proper enforcement mechanisms would need to be in place to ensure that this is effective.

If parking pricing is properly balanced with parking demand, and if effective alternate modes (such as micro transit or bus systems) are in place, parking pricing could have a large impact on the number of single occupancy vehicles arriving at or driving within the Garibaldi Resort. Effective parking pricing disincentivizes driving to the resort and encourages people to use other modes. If park & rides are strategically placed and wayfinding apps include information on parking pricing, this can encourage people who are driving to carpool to the resort or ride in on a bus.

Implementation/Design Considerations

To plan where and when parking pricing should vary, it would be important to conduct a parking study to determine where/when parking demand will likely be highest. This would allow for a more informed evaluation of parking options to ensure that parking pricing is determined in a way that lowers the overall parking occupancy and encourage use of other modes while still making parking accessible to those visitors that desire to use it. Parking enforcement will be essential in ensuring that parking pricing is effective at reducing the number of private vehicle trips to the resort. All parking and parking pricing should be integrated into dynamic wayfinding apps to make it more easily viewable by visitors, which would require that effective parking monitoring be in place. Any time limits or other parking restrictions put in place should be done in a way that is logical and appropriately priced so as not to detract from visitor experience.

Installation of parking pricing infrastructure (kiosks or pay-by-phone signage, etc.) has a large up-front cost, and will need to occur at all lots where parking pricing is being implemented. Additional management and maintenance expenses equal to or greater than the initial infrastructure cost would also be needed to ensure the success of the parking pricing system. However, effective parking pricing programs can generally be self-funded, so these costs will likely be quickly addressed by parking revenue.⁴ Additionally, paid parking has a profound impact on trip planning, encouraging visitors to choose alternate modes and ensuring that those that drive will not need to circle to find parking. This will lower both VKT and vehicle emissions.



⁴ The cost score assumes parking revenue generation is ongoing

Near-Term Measures

This section discusses measures that will be available by full build-out of the resort. In addition to encouraging a park-once mentality within the resort and having robust bus service to and from the resort, the near term transportation vision will allow visitors to park at one of multiple central transportation hubs in the Lower Mainland and ride either directly to the resort or to a gondola that will take them to the resort. The following measures will be implemented in the near term:

- *Participation in a Transportation Advisory Committee*
- *Regional Transportation Hub(s) in Lower Mainland*
- *Gondola from Highway to Village*
- *Rail from Lower Mainland*

Measures planned to be implemented in the near-term are those that will not necessarily be constructed by opening day but could be in place by full build-out of the Garibaldi Resort. Like the opening day measures, near-term measures were selected after considering the needs of the resort at full buildout. Certain measures were considered for the near-term rather than opening day due to lower need at Phase 1 rather than full build-out. Additionally, these measures require more extensive coordination and/or construction to fully implement, making it less likely for them to be available on opening day. These measures are contingent on that coordination and may not be able to be implemented without it. In the end, both opening day and near-term measures were balanced and selected to ensure that the Garibaldi Resort meets its environmental and accessibility goals at both opening day and full buildout. These measures are described in the following sections, including a discussion of mode share, cost, and implementation/design considerations.

Participation in a Transportation Advisory Committee

This committee brings together the private ski entities as well as municipalities in the region to coordinate the transportation system at a local and regional level. This type of regional committee has allowed many public and private entities to secure funding more easily for transit, parking, and other transportation endeavors. It has also allowed ski resorts/lodges to better coordinate their shuttle and other services to ensure the satisfaction of their customers. The parking and transportation advisory committee becomes a public idea sharing space that brings public and private entities together to better coordinate in meeting regional needs.

Implementation/Design Considerations

In the case of the Garibaldi site, it would be important to organize a parking and transportation advisory committee that includes members from resort operators, Squamish Nation, MOTI, provincial government,

as well as other Sea-to-Sky Corridor municipalities and communities. This would allow for a more open forum for transportation discussion and coordination and could lead to the effective implementation of various other travel demand mitigation strategies.

It is likely that the formation of a transportation advisory committee that includes Squamish Nation, Whistler, and other Sea-to-Sky Corridor municipalities and communities would likely require leadership from the Ministry of Transportation or a similar provincial level agency, and would also take time to establish, making it less likely to be a measure that would influence the Garibaldi resort's mobility landscape on opening day.⁵

Regional Transportation Hub(s) in Lower Mainland

Regional transportation hub(s) would be centrally located in the Lower Mainland and would connect with rail/bus with the potential to connect to Washington highspeed rail in the future. The intent behind this transportation hub would be to service Garibaldi as well as other popular ski or recreational amenities around Vancouver. Within the facility, valet and locker services could be available in addition to equipment servicing. Restaurants as well as retail offerings would likely be available at the transportation hub as well.

This Lower Mainland transportation hub would allow visitors to access multiple methods of getting to Garibaldi, including rail and bus, without having to access the Sea-to-Sky Highway. This would allow public transit users within Vancouver and other areas an easy way to transfer modes, while also allowing those driving a cheaper parking alternative prior to entering Sea-to-Sky Highway. Additionally, many non-ski commuters would also have the ability to use this hub in their commute to work or study in Vancouver. This lowers the overall number of vehicles both on Sea-to-Sky Highway and accessing the Garibaldi Resort.

Implementation/Design Considerations

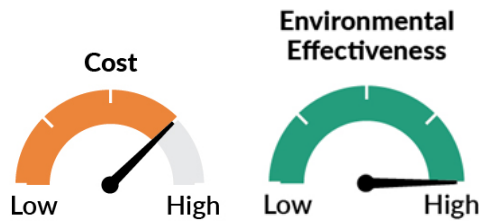
A transportation hub in the Lower Mainland would need to provide a substantial amount of parking to ensure that it is utilized efficiently. This would include providing central pickup and drop off areas at various locations within the transportation hub and ensuring that ample private coach and other services are integrated into the hub. Integrating valet seamlessly with the private coach services would also be essential to ensure that the visitor experience remains hassle free from the moment of arriving at the transportation hub.

Additionally, multiple park & rides would need to be constructed to supplement the transportation hub. These could be distributed in the Lower Mainland, along the Sea-to-Sky Highway, in Squamish, and at the highway access to the resort. It is likely that at opening day only some of these park & rides would be constructed. The location of these park & rides would be carefully considered to provide central pickup locations for both employees and visitors. Each park & ride should be designed with multiple pick

⁵ The cost and environmental effectiveness scores are N/A, as this measure is more of an ongoing planning activity

up/drop off locations distributed centrally throughout the lot, and the spaces required at these park & rides should be determined based on the number of buses that will service the given park & ride.

Construction of a large transportation hub in the Lower Mainland would require substantial initial investment to design and construct all the physical infrastructure for the transportation hub, including parking, retail/restaurant locations, etc. This cost may also increase depending on the type of parking infrastructure being provided, whether that be a parking structure or surface lot. Assuming the transportation hub is well integrated with the regional transit network and the private buses providing access to and from the resort, this measure would be effective at reducing VKT and vehicle emissions.



Gondola from Highway to Village

The Garibaldi Resort could design its transportation connections to the highway from the village to be seamless and hassle-free. One seamless connection that would be introduced in the near-term would be a gondola connecting the park & ride at a suitable highway location, to the main village of the resort. This gondola would operate in regular intervals and would provide a non-roadway alternative to access the resort.

Although this gondola would not alleviate traffic on Sea-to-Sky Highway, it would facilitate visitors and/or employees parking in a satellite location or using highway-based transit services and then using the gondola as a first/last mile connection. This would support use of alternate transit modes within the resort. Moreover, a gondola could be highly consistent with the resort experience, providing a scenic alternative for accessing the resort. Because of its scenic qualities, it may become an added draw to visiting the resort. It would also serve as an efficient connection to the resort that would run at regular intervals, making it competitive with driving and riding the bus, particularly during high traffic times while also providing a steady stream of visitors arriving at the ticket window rather than the intervals of visitors arriving by scheduled private bus and coach services. Additionally, the gondola would be environmentally sustainable and quiet.

Implementation/Design Considerations

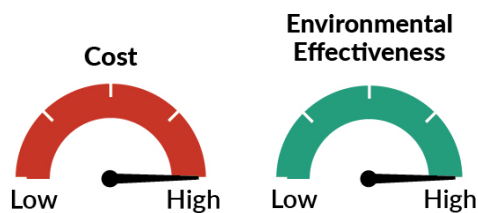
A gondola between the highway access and the Garibaldi Resort would require careful planning to avoid any existing utility lines or environmentally protected areas. Additionally, the system would need to be designed to be three-cable to ensure a smooth and stable ride year-round. Because of the high volume of visitors that can be carried via the gondola, it would also be essential to provide ample parking at the park

& ride located at the highway access to the resort, and that a direct tie-in be designed and constructed between the gondola and the parking/private coach pick up and drop off areas.

In terms of cost, the gondola would likely be less expensive than the train service but would still be costly to build. Likewise, it would have continual maintenance and operation costs over the lifetime of the gondola. Additionally, Gondolas are quiet and environmentally responsible, and would lower VKT and vehicle emissions by carrying visitors from the park & ride to the resort that would otherwise drive or ride a bus/shuttle.



Source: Flickr, Ron Cogswell



Rail from Lower Mainland

Vancouver and the Lower Mainland already have an existing rail service networks (SkyTrain and Canada Line), which service much of Metro Vancouver. Currently, there are no rapid transit passenger rail connections to North Vancouver or Squamish. However, existing infrastructure is in place that could be

utilized to bring rail service from Vancouver to Squamish, where a transportation hub to Garibaldi could tie into the rail service. This would provide a medium/higher speed and comfortable alternative to driving or public/private bus service that would be attractive to many visitors.

If regular train service can be established between Squamish, North Vancouver, and Vancouver, this would be a very attractive option to users in the Lower Mainland, including those arriving at the Vancouver airport. This rail line would run independent of the Sea-to-Sky Highway, and thus would be relatively unaffected by travel patterns on the highway. Having an effective rail line like this established, particularly if the service is supplemented by a transportation hub with direct transit connections to Garibaldi, would draw substantial users from other modes.

Implementation/Design Considerations

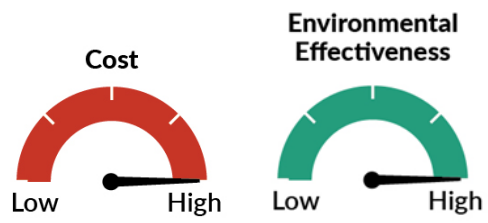
Implementation of a regular rail service between the Lower Mainland and the highway access or Squamish would take a considerable amount of time, investment, and effort. Any rail construction and train service will require coordination with various agencies and organizations to ensure the lowest possible cost of construction, equitable and efficient service, and mitigation of environmental impacts. These agencies/organizations could include the Squamish Nation, CN Rail, Whistler, other communities along the Sea-to-Sky Highway, the MOTI, etc. Although existing rail infrastructure does exist between Squamish and Vancouver, this infrastructure will need to be updated and expanded based on how many visitors are anticipated to use it. It is important to note that ridership will likely vary based on the time of year, and as such service would need to be planned accordingly. As this service would require extensive planning and coordination, it would be important to begin coordination as soon as possible. Even with immediate exploration of rail transit, it is likely this measure may not be available by full build-out of the resort and would be a longer-term measure.

This rail service may require multiple tie-ins between Vancouver and Squamish that would require coordination with local municipalities. Additionally, Garibaldi would need to construct a transportation hub that would tie into this rail service in either Squamish or at the highway access to the resort. Any rail infrastructure that is constructed would, by nature, be part of regional planning that will require on-going collaboration with government and other private sector partners. As such, the design and related construction of the rail service would need to be paid for in partnership with these regional and local entities. Revenue from rail service would likely not cover the costs of providing the service, and as such these partnerships will be essential before these services could be considered viable. The rail service would also be effective in lowering VKT and vehicle emissions for all parties involved along the Sea-to-Sky Highway.⁶

⁶ It is important to note that any construction resulting from expanding the existing rail would have a large environmental impact. This is not included in the environmental effectiveness score, as that score focuses specifically on the ability of the measure to reduce VKT and vehicle emissions.



Source: Flickr, AvgeekJoe



Long-Term Considerations

This section discusses long-term considerations that the resort will need to account for as it continues to grow. The long-term vision for the resort is that visitors will enjoy diverse methods to arrive at the resort, including rail and bus services supported by central transportation hubs in the Lower Mainland. Additionally, visitors will have the option of using a gondola, active transportation, electric buses, and micro transit to navigate within the resort and to get from the resort to the highway. The following considerations will be considered as more long-term measures are planned:

- *Autonomous Vehicle (AV) and Connected Vehicle (CV) Infrastructure*
- *Travel Experiences to the Garibaldi Resort*

In addition to the measures that will be in place at opening day and in the near term (coinciding with full build-out), it is important to consider other technologies and opportunities that may impact the transportation dynamic of the Garibaldi Resort in the long-term. These considerations may influence how other measures already described are being implemented at opening day and in the near-term. However, measures resulting from these future considerations may be implemented in the future and are not currently planned.

These long-term considerations will also need significant project development activities, such as ridership analysis, environmental analyses, and other planning actions. These considerations will also, by nature, be part of regional planning that will require on-going collaboration with governmental and other private sector partners.

Autonomous Vehicle (AV) and Connected Vehicle (CV) Infrastructure

AV and CV technology can transform how communities manage, operate, and invest in their streets. Given the revolutionary potential of AVs and CVs, the Garibaldi Resort should plan infrastructure with these future technologies in mind.

AVs are equipped with on-board software and hardware that can drive the vehicle instead of a human operator. They are also referred to as self-driving, driverless, or automated vehicles. Connected vehicles, or CVs, meanwhile, can communicate wirelessly with their surroundings and other vehicles to share and receive information regarding the transportation system. Today, many new vehicles include autonomous technology, such as adaptive cruise control, self-parking capabilities, and vehicle route navigation. These features offer the ability to maintain safe and efficient vehicle spacing and flow and are intended to ultimately operate autonomously without requiring driver attention.

While AV and CV technology are not seen as required components of each other, it is likely that these technologies will begin to converge as they continue to develop and mature. Vehicles with AV technology

will greatly benefit from communicating with the roadway infrastructure and users of the transportation network rather than just relying on on-board sensors and a static starting map to understand the conditions of the roadway. Similarly, CVs without automation technology may provide drivers with alerts about upcoming roadway conditions, like blind spot warnings, but adding automation will more effectively eliminate potential human error.

This convergence would result in connected autonomous vehicles (CAVs). Highly autonomous CAVs would operate without the direct need of a human operator as well as benefit from communicating with the roadway infrastructure and other users (i.e., bicycles, pedestrians, transit, freight, etc.) to better anticipate forthcoming interactions and roadway conditions.

Expected Arrival

AV and CV technology is nascent and not fully adopted anywhere. Some autonomous technology is readily available today, but full automation is still to come. Despite rapid advances in AV and CV technology, there is still substantial uncertainty associated with the implementation of AVs and CVs for public use. Estimates range from several years for a highly autonomous vehicle to never for a fully autonomous vehicle (i.e., without the need for a human driver). Even after highly and fully autonomous vehicles are available, it will likely take some time before they represent a significant percentage of the vehicle fleet.

Local and regional agencies have the responsibility to develop and enforce rules for testing and operation of AVs on public roadways. While there is still much uncertainty on the arrival of this technology, the Garibaldi Resort should track developments at the regional level, with particular interest in any recommendations or model bylaws and regulations for local jurisdictions. Regional coordination is imperative in accommodating AVs on regional and resort roads. The Garibaldi Resort will participate in any such regional collaboration efforts to ensure that outcomes are as consistent as possible throughout the region.

Impacts

AVs and CVs could result in significant changes in travel. These range from benefits such as reduced collision rates, more stable traffic flow, increased access to mobility, and reduced driving stress. Potential side effects include increased vehicle travel and overall traffic as well as potential greater demand for low-density development.

Specific AV and CV impacts on regional and resort roadways may include:

- Reduced potential for collisions
- Traffic flow benefits
- Increased access and travel options
- Increase in VKT
- Reduced parking demand

- Increased curb activity (i.e. pick-ups/drop offs)
- Potential for redevelopment due to reduced parking demand
- Decreased transit ridership

How the Garibaldi Resort Can Prepare

Outlining a pathway to address AVs and CVs will help the resort to minimize negative impacts while ensuring that visitors benefit from the technology. Garibaldi Resort should consider undertaking some or all the following steps in the near- and mid-term to prepare for the arrival of AVs and CVs:

Near Term

- Community and stakeholder engagement.
- Begin considering how AVs and CVs may fit into the resort and initiate discussions about how to develop critical policies and priorities for the safe operation of AVs and CVs.
- Track and monitor regional developments, and lobby for Garibaldi Resort interests

Long-Term

- Plan infrastructure needs and build data and computing capacity.
- Develop an inventory of AV-ready assets, asset gaps, and future upgrades that may be necessary.
- Plan for impacts to transit

Regardless of the methods taken to prepare for the arrival of AV and CV technology, any level of preparedness for the inevitable arrival of AVs and CVs will greatly serve the resort.

Travel Experiences to the Garibaldi Resort

In addition to measures that would address travel demand issues internal to the resort and along the Sea-to-Sky Highway, there are also opportunities to provide travel experiences in Squamish that would connect to the resort. These experiences would not necessarily address traffic issues resulting from the resort but would provide unique opportunities to experience the natural beauty of Squamish and other areas near Garibaldi. These experiences could include the implementation of ferry service between Vancouver and Squamish, and Squamish Nation guided water-based tours from Horseshoe Bay to cultural points of interest up Howe Sound, ultimately transferring to passenger shuttle and then the resort.



Next Steps

This Transportation Concept is the first step in the development of a Transportation Plan, as required by the project's Environmental Assessment (EA) Certificate Condition #11 (see Appendix C). The Transportation Plan is intended to guide the resort's transportation decisions over the life of the resort. Advancing the resort project requires that the project Master Plan be accepted by the Mountain Resorts Branch, and a subsequent Master Development Agreement between the resort and the province. All next steps identified below assume that the Mountain Resorts Branch has accepted the Master Plan.

The Transportation Concept will be the forward-looking foundation for the next steps of developing the resort Transportation Plan. These steps are described in the following sections.

Procedural Next Steps

First Nation Consultation

As the resort will rely on moving visitors through Squamish Nation Traditional Territory, it is fundamental to consult with Squamish Nation. Consultation should include environmental, economic, social, and cultural considerations. These could range from ensuring a zero-emissions bus fleet, to Squamish Nation owned and operated transportation providers, and integration of cultural learning opportunities during transportation to and from the resort.

Public Consultation

The goal of public consultation will be to vet the Transportation Concept with the transportation needs of corridor residents, resort visitors, and other private industries and user groups that rely on movement through the corridor for personal and business needs. Public consultation is also a time to identify emerging trends, information gaps, transportation gaps, and preferred courses of action for the next stage of the Transportation Plan development.

Agency and Transportation Industry Consultation

Dedicated consultation with a cross section of agencies will occur. To be successful, the development of the transportation plan needs to integrate the goals and considerations of public agencies in the Sea-to-Sky Corridor and Lower Mainland, including transportation industry providers, provincial agencies like BC Transit, and participating local governments who seek to partner in the development of corridor-based multi-modal transportation solutions.

Update of Transportation Data Counts and Forecast

An update to the “Garibaldi at Squamish Traffic & Safety Impact Assessment” Bunt & Associates report (prepared in 2014) will provide updated data that will highlight transportation trends, emerging transportation pressure points, and transportation improvement areas in the Sea-to-Sky corridor. Following updates to transportation data, a forecast that evaluates the current Business as Usual (BAU) and the approach and interventions of the Transportation Concept will refine the short, medium, and long-term approaches for the resorts Transportation Plan.

Draft Transportation Plan

Working collaboratively with the Ministry of Transportation and Infrastructure, the Transportation Plan will use the findings of consultation and updated corridor transportation data to develop a draft Transportation Plan. This plan will identify the full range of transportation approaches to the resort and within the resort over the first 25 years of resort operation along with identification of required analyses and cooperating partners. The draft plan will also identify an implementation and monitoring program that will allow the resort to be adaptable and responsive to shifts and changes in technology, visitor preferences, peak and shoulder season visitation shifts, and other corridor wide trends.

Second Round of Consultation

This round of consultation will present the draft Transportation Plan to First Nations, Agencies, Industry, and the General Public. Consultation will focus on short, medium, and long-term implementation, gaps and improvement areas that are within or external to the resort, and alignment of transportation goals and objectives between the resort and a broader regional context. The second round of consultation will affirm the transportation responsibilities of the resort in relation to other municipalities, industries, and transportation providers in the Sea-to-Sky corridor and the Lower Mainland.

Finalization of Transportation Plan

Input and findings from the second round of consultation will inform the final version of the plan. The resort will work with the Ministry of Transportation and Infrastructure (MOTI) to ensure the plan meets provincial standards and the requirements of the EA Certificate. With MOTI approval, the Transportation Plan will be finalized and put into action during the construction and operation of the resort.

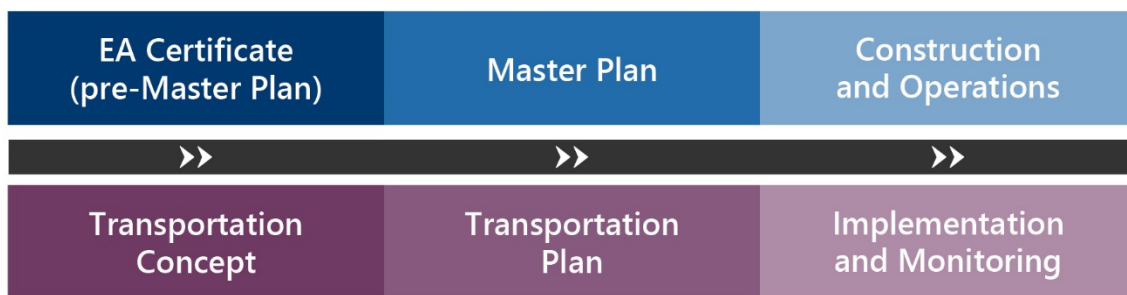
Additional Implementation Steps

The resort should consider appointing a single point of contact to manage all transportation-related studies and projects related to Garibaldi that impact the regional transportation network. Having this point of contact will ensure that effective coordination can occur between the resort and other local or regional entities. Additionally, this point of contact will determine the necessity of and manage any studies that need to be performed for specific measures. Many of the transportation demand management strategies identified in this document will require additional study prior to implementation.

Timeline

The Transportation Plan timeline is shown in Figure 3. This graphic shows the correlation between the Master Plan and Transportation Plan timelines.

Figure 3: Transportation Plan Timeline



Technical Next Steps

Update Full Traffic Study

The 2014 traffic study prepared by Bunt and Associates will need to be updated as part of environmental impact assessment. Accurately modeling vehicle trip reductions related to transit and travel demand management measures to correctly estimate the traffic impacts of the resort will be crucial in providing an accurate and defensible traffic study.

Further Advance Mobility Hub Concept

It will be essential to do a more detailed assessment of mobility hubs for the resort, with an eye towards sustainability, customer experience, shuttle accommodation, and autonomous vehicle readiness. The goal of this assessment will be to ensure that this element of the resort truly advances both mobility and sustainability outcomes. There are currently three mobility hubs that would be a priority for the resort: one on-site, one at the interchange with the Sea-to-Sky Highway, and one in the lower mainland. While

the mobility hub in the lower mainland will likely be a larger regional effort, the other two should be planned for opening day operation.

Develop Standalone TDM Plan for Resort

Developing a standalone TDM plan for the resort would be a necessary implementation item to ensure that the resort achieves the mode share and mobility objectives assumed in the traffic study. The TDM plan would include developing more specificity around the specific measures in place, the mode share benefits achieved, when measures are implemented, and the entities involved in administering these programs. A standalone TDM plan could also include an onsite parking & circulation plan, which identifies paid parking zones and a reservation system (which is highly recommended for resorts of this type), and app-based transportation concierge (an increasingly common amenity for resorts).

Data & Monitoring Plan

Part and parcel with the TDM plan is developing a monitoring system. This includes identifying the measures to be monitored (such as number of cars entering the resort, mode share, VKT, GHG emissions) and the data sources to use. The resort will need to identify the systems that would need to be developed versus what data is available from other sources.

Market Study for Shuttle Program

The resort will likely have to run its own shuttle program (or partner with the existing shuttle/coach operators) until more regional transit is available. This will necessitate understanding origins, destinations, and travel sheds. One method of doing this could be using cell phone and mobile source location data. This data would help the resort understand where shuttle service should go to be most effective, which would help narrow down on appropriate park & ride locations, etc.

User-Friendly Online Outreach Platforms

There are several user-friendly, online platforms, such as the CrowdSource+ tool offered by Fehr & Peers, that could assist with online outreach. This sort of outreach could help the resort reach out to the greater British Columbia community to ask questions like "How would you access a resort at Garibaldi?" "Where would you be traveling from?" "What measure would get you out of your car?"

Appendix A – Transportation Demand Management Case Studies Report



Garibaldi Transportation Concept

Case Study Review

Prepared for the Aquilini Group

May 2020

FEHR PEERS



Introduction




Garibaldi at Squamish will be a year-round destination recreational resort community on the Brohm Ridge slopes of Mount Garibaldi, located roughly 13 kilometers (km) north of Squamish, BC. Among the many goals of the resort is to ensure ease of access to the mountain by developing regional and local transportation options that manage travel demand to and from the resort.

In order to identify travel demand management strategies that could be effectively applied to the Garibaldi site, 16 resort communities were identified as potential candidates for a travel demand management case study. Of these, four were selected and case studies were performed: Park City, UT; Ketchum, ID; Aspen, CO; and Vail, CO. These communities were selected for a variety of reasons, such as the unique travel demand management strategies being employed by the community, their location relative to major urban areas, their size, and/or the regional transportation infrastructure available to the community. In order to get a clear idea of the unique transportation successes and challenges for each case study community, questionnaires were sent to local staff and interviews were performed. This report summarizes these case studies, providing context on the unique facilities and transportation networks available at each community, comparing each community to the Garibaldi site, and highlighting unique and/or effective travel demand management strategies employed by the community.

Documentation of the effectiveness of various TDM/Carbon Reduction Measures

For each case study, we identify a few select TDM/carbon reduction strategies and describe their performance based on three metrics:

- Parking demand reduction – whether the strategy allows the community and/or resort to provide fewer parking spaces
- Visitor/user experience – a qualitative assessment of user experience, in terms of how intuitive the strategy is and how impactful it is on user experience
- Environmental footprint – discusses the strategy's performance in reducing overall driving trips and/or vehicle trip length

			
Parking Demand Reduction	Low	Medium	High
Visitor/User Experience	Not Appealing	Neutral	Appealing
Environmental Footprint	Low	Medium	High



Park City, UT



Case Study Description

Facility Context

Park City, UT is a resort community that serves three major ski resorts during the winter, as well as film festivals, mountain biking, and other outdoor recreation. Park City receives approximately 600,000 overnight visitors annually, with many more staying at resorts within the surrounding Summit County. Nearly 40,000 of these visitors come during the nine-day Sundance Film Festival. See the red pin on the map for the general location of Park City in relation to Salt Lake City, UT.



Transportation Context

The peak travel season for Park City is from mid-December through March, although summer travel has increased in conjunction with additional outdoor recreation amenities. While recreational travel peaks on the weekends, Park City has seen clear traffic patterns that correlate with resort entering and exiting traffic during the week, particularly on blue bird and powder days. As with many resort communities, ski/recreational ingress occurs during the same morning peak hour as commuter ingress, but the



recreational evening peak hour tends to be earlier – between 3pm and 4pm. Two regional roadways (I-80 and SR 190) connect Park City to Salt Lake City, the closest urban area, and another regional roadway (SR 189) provides connection to communities on the east. There are two major arterials that provide access to Park City's historic downtown from these regional connections: SR 224 from the north/west and SR 248 from the east. Both operate as arterials, although SR 248 narrows from 5 lanes to 2 lanes as it travels into Park City's downtown, creating a major choke point for recreational and commuter traffic during the morning peak hour. For now, the biggest travel management issue identified is how to get people into and out of the city, rather than managing traffic within the city itself.

Park City Council has loosely adopted a 'transit first' policy to prioritize transit improvements for the region. Currently, transit service is free in Summit County (which includes Park City). However, Park City is still trying to solidify a unified vision that is backed by quantifiable needs. The question that both City Council and staff are trying to answer is what types of capital investments and transit programs can help alleviate the traffic issues presented by only having two regional access points to the city. Gondolas and bus rapid transit have been proposed

Park City has also emphasized reducing the city's carbon footprint, with a net-zero carbon emissions goal for all transit and city fleet vehicles by 2022, and for the entire community by 2030. As part of this, Park City has transitioned multiple transit lines to battery electric buses and plans to continue this transition.

Comparison to Garibaldi Site

Park City is closer to a major metropolitan area than the Garibaldi Site, being roughly 50 km away from downtown Salt Lake City. The Brohm Lake Turn Off (where the main access road will join Highway 99) is approximately 80 km from Vancouver City Hall. Additionally, Park City has three regional roadways that connect to two larger arterials which provide access to the city and its resort amenities, whereas Garibaldi only has one regional roadway and limited potential to provide additional roadway infrastructure. Park City also has a more established community within city limits, with thousands of permanent residents in addition to the normal commuters and tourists. The combined demand generated by permanent residents and commuters/tourists has allowed for a robust transit system to emerge that connects directly to Salt Lake City as well as providing interconnected service throughout Park City and the surrounding Summit County. Although the Garibaldi Site has the potential for transit connection as a result of transit lines that pass along the Sea-to-Sky Highway between Vancouver, Squamish, and Whistler, the existing transit system is more limited.





June 12, 2020

Types of TDM/Carbon Reduction Measures

Free and Frequent Low to Zero-Emission Transit



Implementation:

- Operating budget of \$15M per year
- Resorts help with funding system, though bulk of funding comes from Federal Transit Administration (FTA) and Summit County sales tax
- Advertising:
 - Visitor's bureau and lodging websites both advertise Park City as "car free" or "park once"
- Ridership monitoring is reliable and in place
- Service frequency changes throughout the year based on events and peak season

Benefits:

- 2.6 million trips per year system wide and growing
- This system serves the whole region including the transit-dependent work force, not just visitors
- Because of the City's investment, current operation includes all day service, as well as evening hours, and has a frequency of 10-20 minutes, depending on route

Challenges:

- There are currently four days in the year where the transit schedules and frequencies shift, which makes consistent service reliability a challenge for regular commuters
- The funding and maintenance dynamic in Park City is complicated; with no regional transit authority to balance City and Countywide interests, Park City and Summit County sometimes have competing interests in how transit service is administered leading to suboptimal service outcomes (at least from the City's perspective).

Effectiveness:

Parking Demand Reduction



High

Visitor/User Experience



Appealing

Environmental Footprint



High



June 12, 2020

Dynamic Parking Pricing

Implementation:

- The implementation generally just requires staff time, and paying for flexible parking software
- Promoted via social media
- Park City has yet to find the tipping point for event-based parking pricing, and has found that some visitors will pay \$60 for the day on an event.

Benefits:

- This measure has helped reduce overall traffic by discouraging people from driving altogether (due to high parking costs). Additionally, circling for parking has decreased as high parking pricing decreases parking occupancy, making it easier to find a parking spot.
- In conjunction with bus lanes and other measures implemented during peak season, transit ridership has increased

Challenges:

- Monitoring has been a challenge to properly coordinate
- Having consistent and up-to-date parking technology across all parking lots

Effectiveness:

Parking Demand Reduction



High

Visitor/User Experience



Neutral

Environmental Footprint



High



June 12, 2020

Bus-Only HOT Lane on Deer Valley Drive

Implementation:

- Implemented only during peak season
- Requires barricades and staff time, as well as sufficient existing infrastructure on given roadway
- Promoted using local newspaper, local radio and social media
- The demand for the routes affected by this temporary bus-only lane has increased as a result of the lower transit travel time. As such, the city has increased the number of days that this bus-only lane is in service.

Benefits:

- Increased transit ridership observed during times when barricades are in place
- Because of transit-only lane, bus travel times become faster than vehicle travel times

Challenges

- Because the temporary bus lane impacts the cross-section of the roadway by putting temporary barricades in place, snow removal along the roadway becomes more difficult than it would otherwise be.
- This measure is only successful in conjunction with other measures such as high parking costs

Effectiveness:

Parking Demand Reduction



Medium

Visitor/User Experience



Neutral

Environmental Footprint



Medium



June 12, 2020

Drop-Off/Loading Zones in Downtown

This measure was recently implemented by Park City in order to reduce curbside dwell time caused by shuttles, residents, and ride-share companies. Overall, city staff expressed dissatisfaction with the current operation of this system. They have observed a decrease in drop-off/loading violations for residents and resort shuttles, as well as better downtown circulation. However, they have had difficulty getting ride-share companies to adhere to the appropriate zones. Under Utah law, municipalities are not able to impose certain regulations on ride-share companies. Should this measure be considered for Garibaldi, it is important that proper enforcement mechanisms be put in place and that necessary coordination be made with municipalities and groups.





Ketchum, ID



Case Study Description



Facility Context

Ketchum, ID is a resort community that serves the Sun Valley Ski Resorts during the winter, in addition to various other outdoor recreational activities year-round. Ketchum also hosts multiple arts and other cultural festivals during the summer months. See the red pin on the map for the general location of Ketchum in relation to Twin Falls, ID.

Transportation Context

The peak travel seasons for Ketchum are December through February and June through September. While recreational travel peaks on the weekends, Ketchum also sees traffic patterns that correlate with resort entering and exiting traffic during the week, particularly on blue bird and powder days. As with many resort communities, ski/recreational ingress occurs during the same morning peak hour as commuter ingress, while the recreational evening peak hour is more unpredictable. Ketchum has one regional roadway (SR 75) running north/south through the city that connects Ketchum to many communities to the south. At its most constrained points, SR 75 is a two-lane arterial roadway, but it widens in other areas to include 3-5 lanes, leading to bottlenecks during high travel times. SR 75 connects into other local and regional roadways (such as Gannett Road, SR 20 and SR 26). Based on the limited regional



roadway infrastructure, the biggest travel management issue identified is how to get people into and out of the city, rather than managing traffic within the city itself.

Mountain Rides Transportation Authority provides transit service to many of the communities of Blaine County, including local service in Ketchum and Sun Valley, as well as more regional connections to Hailey and other towns. This transit service varies seasonally in order to meet the summer and winter tourist demands, with most buses running on 15-30 minute headways.

Comparison to Garibaldi Site

Ketchum/Sun Valley is further from a major metropolitan area than the Garibaldi Site, being roughly 130 kilometers (km) away from downtown Twin Falls. The Brohm Lake Turn Off (where the main access road will join Highway 99) is approximately 80 km from Vancouver City Hall. Like the Garibaldi site, Ketchum has one regional roadway that provides connection to the two portions of the Sun Valley resort. However, whereas Ketchum has an established community that has two resorts directly to the east and west of the city, the Garibaldi site would consist of one main village area, residential development and a couple of commercial nodes, with Squamish 15 km away from the resort proper. Ketchum also has a strong local transit system that does not yet exist in the Garibaldi area, although Garibaldi does have the potential for regional connections that would pass along the Sea-to-Sky Highway between Vancouver, Squamish and Whistler.





Types of TDM/Carbon Reduction Measures

Robust Pedestrian and Bicycle Improvements



Implementation:

- Requires public outreach to ensure that pedestrian and bike routes meet local needs
- Includes bike lanes, comfortable pedestrian sidewalks, flagged and flashing pedestrian crossings, etc.
- Best implemented as roadway infrastructure is built to ensure proper coordination between modes
- Should be coordinated well with transit system and parking systems

Benefits:

- An effective supplement to encourage “park once” behavior, allowing people to navigate areas of the community without driving
- Proper infrastructure increases non-motorized user safety
- Improves efficiency of transit systems by providing infrastructure for the “first mile, last mile” portion of the trip

Challenges:

- Requires extensive planning and construction to ensure a well-integrated system
- As this is permanent infrastructure, the upfront costs can be higher than other travel demand management strategies
- If community/visitors are very auto-centric, support for policy shifts towards non-motorized improvements could prove difficult

Effectiveness:

Parking Demand Reduction



Medium

Visitor/User Experience



Appealing

Environmental Footprint



High



June 12, 2020

Peak Parking Pricing

Implementation:

- The implementation generally just requires staff time, and paying for flexible parking software
- Parking price varies by time of day (more during evening hours, less during day-time hours)
- City also sells monthly parking permits for certain city lots that vary in price between peak and off-peak season
- Promoted via social media

Benefits:

- This measure has helped reduce overall traffic by discouraging people from driving altogether (due to high parking costs). Additionally, circling for parking has decreased as high parking pricing decreases parking occupancy, making it easier to find a parking spot.
- In conjunction with high quality transit and other measures implemented during peak season, transit ridership has increased

Challenges:

- Monitoring has been a challenge to properly coordinate
- Having consistent and up-to-date parking technology across all parking lots
- Citizen backlash has occurred with each rate change

Effectiveness:

Parking Demand Reduction



High

Visitor/User Experience



Neutral

Environmental Footprint



High



June 12, 2020

Parking and Transportation Advisory Committee (Participation)

In the case of Ketchum, this committee brings together the private ski entities as well as municipalities in the region to coordinate the transportation system at a local and regional level. This has allowed cities to secure funding more easily for transit, parking, and other transportation endeavors. It has also allowed ski resorts/lodges to better coordinate their shuttle and other services to ensure the satisfaction of their customers. This parking and transportation advisory committee becomes a public idea sharing space that brings public and private entities together in order to better coordinate in meeting regional needs.

In the case of the Garibaldi site, it would be important to organize a parking and transportation advisory committee that includes members from resort operators, Squamish Nation, MITI, provincial government, as well as other Sea-to-Sky Corridor municipalities and communities. This would allow for a more open forum for transportation discussion and coordination, and could lead to the effective implementation of various other travel demand mitigation strategies.



Bike-Share Service



From 2012-2019, Mountain Rides Transportation Authority provided a bike-share service in partnership with Ketchum and Hailey. This service included 40 cruiser bikes that could be borrowed for short-term trips. The pay-as-you-go pass was \$5 per day; Mountain Rides also offered four-day passes (\$12) as well as monthly memberships (\$30) to give lower cost options. This service was originally funded by a \$20,000 grant by the US Environmental Protection Agency, and was discontinued after seven years. Although the program was never profitable, it never operated under a deficit either. Mountain Rides staff considers the bike-share program to be a minimal success. They noted that there was not really a willingness by consumers to pay for bike-share. Additionally, residents and second-home owners in Ketchum tend to have their own personal bikes, while robust rental services are available for visitors. As such, the need/demand for the bike share program was consistently in question.

Garibaldi has planned for various methods of internal capture to help mitigate trips internal to the resort complex. Bike share has already been discussed within the Aquilini Group, and it has been decided that if such a program were to be implemented, it would likely have to be with e-bikes or other electric micro transportation.



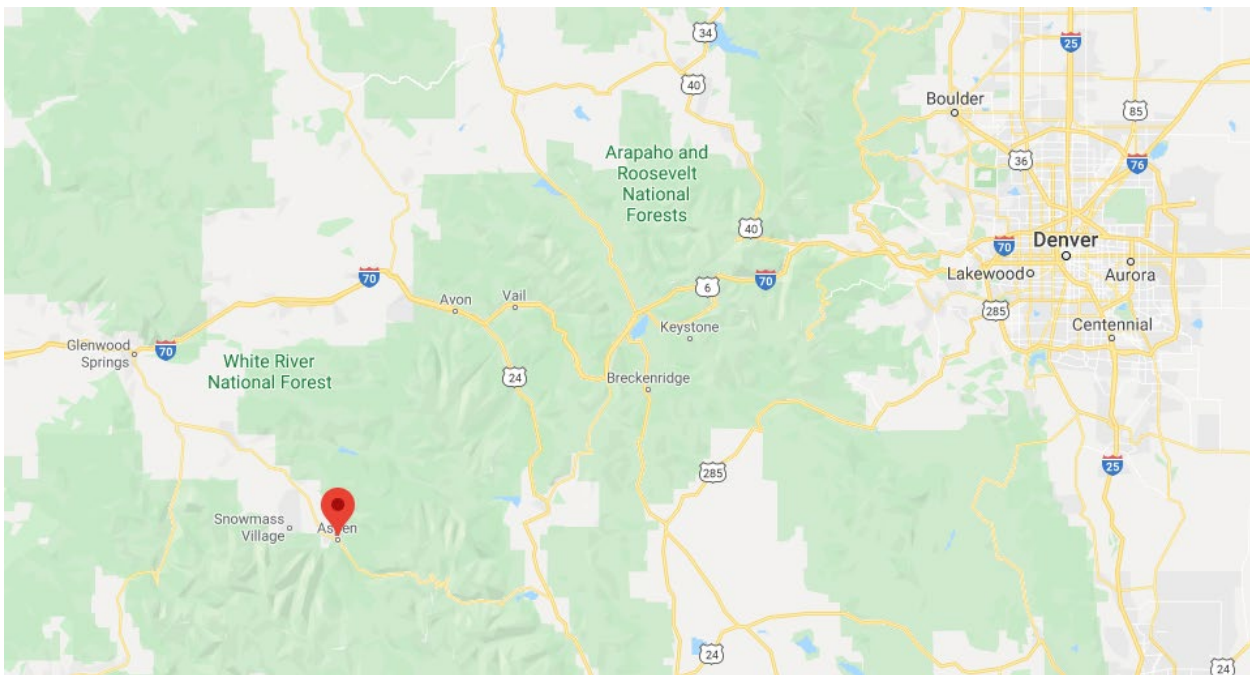
Aspen, CO



Case Study Description

Facility Context

Aspen, CO is a resort community that serves four major ski resorts during the winter, in addition to being a hub for various outdoor recreation activities year-round, including the X-Games. In the 2019 ski season alone, the four major ski resorts served by Aspen received approximately 1.5 million visitors. See the red pin on the map for the general location of Aspen in relation to Denver, CO.





Transportation Context

The obvious peak travel season for Aspen is winter. However, this peak travel features a lot of travelers flying to Aspen rather than driving. This is due to high ski demand from long-distance tourists and because SR 82 (the main access road to Aspen) is closed east of Aspen. As such, the peak driving season for Aspen is the summer when SR 82 is fully open to traffic, allowing more local visitors to travel from the surrounding areas. I-70 is Aspen's closest major regional connection and intersects with SR 82 approximately 65 km northwest of Aspen. During the summer, when SR 82 opens east of Aspen, it also connects with SR 24, which provides an alternate route to I-70. The daily travel peaks follow normal commuter patterns in the winter, with the peak travel periods being 7am – 9am and 4pm – 6pm. However, it has been observed by City staff that the daily travel peaks during the summer are more random and unpredictable. During the worst summer travel days, it has been observed that it can take up to 40 minutes to travel the seven-mile stretch from downtown Aspen to the airport; however, this is uncommon for most summer days, and very rare in the winter.

Transit service is provided by Roaring Fork Transportation Authority (RFTA), in addition to the micro transit service Downtowner that is contracted by the city of Aspen. This service emphasizes more commuter services, providing regional connection to nearby communities, as well as more local service within the city itself. Aspen is committed to reducing greenhouse gas emissions 30% communitywide by 2020 and 80% by 2050. This is being done through efficient transit and city fleet vehicles, as well as through a robust carpool system.

A big emphasis of the City of Aspen is to layer services. Rather than focus on providing any one transportation alternative, Aspen has worked to have a wide variety of alternatives and travel demand measures that are attractive to both wealthy visitors/residents and commuters/service employees. These include carpool incentives, micro transit/free transit, dynamic parking pricing, etc. The City's goal is to use all of these measures synergistically, rather than emphasizing any one strategy.

Comparison to Garibaldi Site

Aspen is much farther away from a major metropolitan area than the Garibaldi Site, being roughly 200 km away from downtown Denver. The Brohm Lake Turn Off (where the main access road will join Highway 99) is approximately 80 km from Vancouver City Hall. Similar to the Garibaldi site, Aspen has one major arterial providing access to it, with more regional connections tying in further away from the city. However, Aspen also has a more established community within city limits, with 7,000-8,000 permanent residents in addition to the normal commuters and tourists. The combined demand generated by permanent residents and commuters/tourists has allowed for a strong regional transit system to emerge that connects to various communities around Aspen, as well as long-distance bus connections from Denver. The Garibaldi Site has the potential for similar long-distance bus connection as a result of transit lines that pass along the Sea-to-Sky Highway between Vancouver, Squamish, and Whistler; however, the existing local transit system is more limited.





June 12, 2020

Types of TDM/Carbon Reduction Measures

Fare Free Transit

Implementation:

- Aspen has an annual operating budget of \$3-4 Million for Transit that it pays to RFTA for local transit service
- Fare-free aspect funded by lodging tax, sales tax, use tax, and parking fees within Aspen
- Transit has never had a fare within Aspen
- Thorough tracking of customer metrics and comments is done monthly to ensure more adaptable service
- Service frequency changes throughout the year based on events and peak season
- Seasonal transit pass available with 30-40% overall discount for more regional connections

Benefits:

- 5.1 million trips per year system wide and growing for RFTA, with 1.6 million annual users within Aspen
- Local fare-free transit helps encourage “park once” behavior, as well as encouraging visitors flying in to skip bringing a car
- Because of the City’s investment, current operation includes all day service, as well as evening hours, and has a frequency of 10-20 minutes, depending on route

Challenges:

- Many travelers using transit come from more regional connections, and employers end up having to pay for transit passes for commuting workers

Effectiveness:

Parking Demand Reduction



High

Visitor/User Experience



Appealing

Environmental Footprint



High



June 12, 2020

Dynamic Parking Pricing

Implementation:

- The implementation generally just requires staff time, and paying for flexible parking software
- The goal of dynamic parking pricing is to reduce occupancy in order to avoid people generating traffic by circling the block looking for parking

Benefits:

- This measure has helped reduce overall traffic by discouraging people from driving altogether (due to high parking costs). Additionally, circling for parking has decreased as high parking pricing decreases parking occupancy, making it easier to find a parking spot.
- In conjunction with bus lanes and other measures implemented during peak season, transit ridership has increased

Challenges:

- Pinning down the exact rate to charge for specific events is always difficult, and some city staff feel that they could always be charging more
- Having consistent and up-to-date parking technology across all parking lots

Effectiveness:

Parking Demand Reduction



High

Visitor/User Experience



Neutral

Environmental Footprint



High



Micro Transit (Downtowner)



Implementation:

- City pays roughly \$0.5 - 1 million annually to contractor Downtowner in order to run the service
- Service runs specifically within the downtown area, and is free
- Service is door-to-door, and is currently on demand similar to ride share apps like Uber or Lyft
- Availability of rides shifts from winter to summer to accommodate varying demand

Benefits:

- Very positive feedback from riders
- Low to no carbon emission vehicles
- Run by a third party
- 79,000 riders in 2019

Challenges

- By nature of service structure, service potential is very limited, and the City is currently struggling to define what the role of the Downtowner will be as demand increases in the future
- Range of fully electric vehicles during winter months can vary, presenting uncertainty in implementation

Effectiveness:

Parking Demand Reduction



Medium

Visitor/User Experience



Appealing

Environmental Footprint



High



June 12, 2020

Carpool Permitting Program

Implementation:

- Allows for free parking at most locations in Aspen in downtown for those who carpool besides select areas in downtown
- Carpool is defined by the City as two or more adults
- City has multiple kiosks set up where carpools go to get a daily permit.
 - This permit includes a “word of the day”, so permits from previous days can’t be used
 - The kiosk attendant confirms that 2+ individuals are in the car before providing the permit
- Heavily enforced rather than being honor-based, with officers checking permits daily for the “word of the day”
- Promoted via City website, social media, and highway signs

Benefits:

- Currently 30,000-40,000 daily permits distributed per year, with demand increasing
- Lowers the overall number of vehicles on both local roads and the regional connections

Challenges

- Requires high parking costs to encourage carpool usage
- Proper enforcement needs to be in place to ensure that the system is not abused
- Kiosks must be placed strategically to encourage use of the program

Effectiveness:

Parking Demand Reduction



High

Visitor/User Experience



Neutral

Environmental Footprint



Medium



June 12, 2020

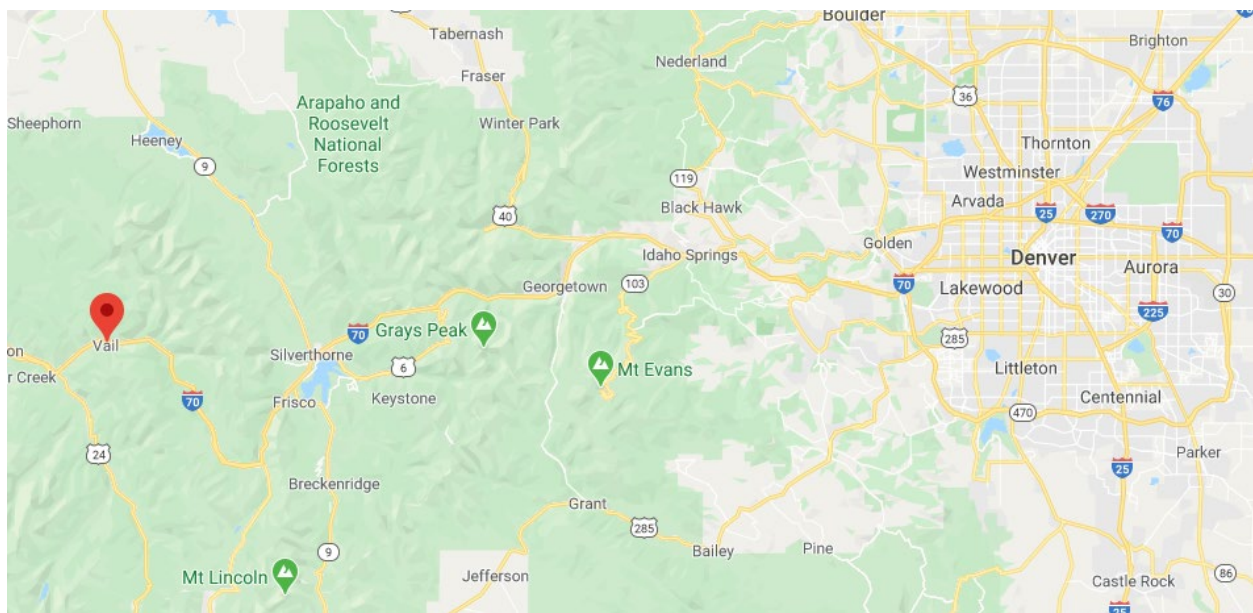
Vail, CO



Case Study Description

Facility Context

Vail, CO is a resort community that serves the Vail Ski Resort during the winter, in addition to being a hub for various outdoor recreation activities in the summer. Vail receives approximately 3.2 million annual visitors, with 2/3 of these visitors coming during the winter ski season. See the red pin on the map for the general location of Vail in relation to Denver, CO.



Transportation Context

The peak travel seasons for Vail are from Christmas week in December through April 1st in the winter, and 4th of July through September in the summer. Vail has direct access to the regional connector, I-70, which is a freeway with two travel lanes in each



direction. Vail has four I-70 exits within city limits, with three of those mitigated by roundabouts. Weekly travel peaks follow similar trends in Vail as other ski communities, with high travel on weekends and powder days. The layout of Vail was designed to be accommodating to long-distance travelers, with large parking facilities having direct and easy access to I-70. Parking is also designed to offer easy access to the walkable town center to encourage “park once” behaviors. Rather than providing a variety of methods for people to get to the city, the main focus of Vail is to give people transportation alternatives once they arrive.

Vail Transit provides free year-round bus service between east and west Vail in order to better connect the various lifts accessing the Vail ski areas. Eagle County Transit (ECO Transit) provides paid regional connections to Vail from the surrounding area. Regional service tends to be used by commuters coming into the city, while local service has a mixture of visitors and commuters using it.

Comparison to Garibaldi Site

Similar to the Garibaldi Site, Vail is easily accessible from the highway (I-70) that connects to its major urban area, Denver. However, Vail is much farther away from a major metropolitan area than the Garibaldi Site, being roughly 160 km away from downtown Denver. The Brohm Lake Turn Off (where the main access road will join Highway 99) is approximately 80 km from Vancouver City Hall. Vail and Garibaldi are both located directly along the regional roadway. However, Vail has multiple accesses onto the regional roadway, whereas Garibaldi is only planned to have one access to Highway 99. Additionally, unlike Vail, the Garibaldi Site has Squamish within 15 km. Vail, on the other hand, is surrounded mostly by small resort communities, making it so that those accessing Vail on a daily basis are more likely to be doing so from longer distances. Vail also has a strong local transit system that does not yet exist in the Garibaldi area, although Garibaldi does have the potential for regional connections that would pass along the Sea-to-Sky Highway between Vancouver, Squamish and Whistler.





Types of TDM/Carbon Reduction Measures

Dynamic Peak Parking Pricing

Implementation:

- The implementation generally just requires staff time, and paying for flexible parking software
- The goal of this parking is to reduce the need for people to drive from place to place within the city, instead parking once and using other modes

Benefits:

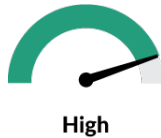
- This measure has helped reduce overall traffic by discouraging people from driving altogether (due to high parking costs). Additionally, circling for parking has decreased as high parking pricing decreases parking occupancy, making it easier to find a parking spot.
- In conjunction with bus lanes and other measures implemented during peak season, transit ridership has increased

Challenges:

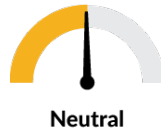
- Monitoring has been a challenge to properly coordinate
- Deciding what parking pricing to implement during given events or seasons
- Having consistent and up-to-date parking technology across all parking lots

Effectiveness:

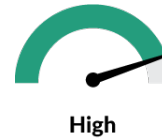
Parking Demand Reduction



Visitor/User Experience



Environmental Footprint





June 12, 2020

Free Hybrid/Electric Transit with Perimeter Seating

Implementation:

- Vail has an annual operating budget of \$5 Million for local transit
- Fare-free aspect funded by lodging tax, sales tax, use tax, and parking fees within Vail
- Service frequency changes throughout the year based on events and peak season
- Electric buses are still under testing to determine efficiency and range during winter season, and city will transition out of hybrid to fully electric once efficiency is up to the city's standards

Benefits:

- Roughly 3 million trips per year system wide and growing
- Local fare-free transit helps encourage "park once" behavior, as well as encouraging visitors flying in to skip bringing a car
- Because of the City's investment, current operation includes all day service, as well as evening hours, and has a frequency of 10-20 minutes, depending on route
- Specifically using perimeter seating has allowed for more standing room on buses to increase the overall capacity of the transit network. This also accommodates people bringing skis, snowboards, and other recreational equipment.

Challenges:

- Transit is currently only free at a local level, so regional commuters/visitors still have to pay for regional use
- The efficiency of the hybrid buses has been good, but with new developments in diesel clean air technologies, investing in more hybrid buses is viewed by the city as no longer worth the cost

Effectiveness:

Parking Demand Reduction



High

Visitor/User Experience



Appealing

Environmental Footprint



High



June 12, 2020

Parking and Transportation Advisory Committee (Participation)

One measure that Vail city staff recommended for any resort community is participation in a regional parking and transportation advisory committee. In the case of Vail, this committee brings together the private ski entities as well as municipalities in the region to coordinate the transportation system at a local and regional level. This has allowed cities to secure funding more easily for transit, parking, and other transportation endeavors. It has also allowed ski resorts/lodges to better coordinate their shuttle and other services to ensure the satisfaction of their customers. This parking and transportation advisory committee becomes a public idea sharing space that brings public and private entities together in order to better coordinate in meeting regional needs.

In the case of the Garibaldi site, it would be important to organize a parking and transportation advisory committee that includes members from resort operators, Squamish Nation, MITI, provincial government, as well as other Sea-to-Sky Corridor municipalities and communities. This would allow for a more open forum for transportation discussion and coordination, and could lead to the effective implementation of various other travel demand mitigation strategies.



Next Steps

Following development of this memo, Fehr & Peers will lead a concepts workshop with the Aquilini Group to present the findings of these case study research, including identification of measures that may be applicable for the Garibaldi area and how these measures would advance the Aquilini Group's desire to create an ecologically-minded resort destination (in terms of reduced greenhouse gas emissions, vehicles miles traveled, and congestion) that is welcoming and accessible to both visitors and employees. This workshop is scheduled for May 11, 2020 and is intended to solicit feedback on measures to research further and/or include in the Transportation Concept.

Following the workshop, Fehr & Peers will develop the Garibaldi Area Transportation Concept that is forward looking and advances the Aquilini Group's desire to be both ecologically-minded and highly accessible. The concept will quantify the effectiveness of proposed transportation demand management (TDM) and carbon reduction measures in terms of mode share benefits, the estimated cost ranges and implementation/design considerations of these measures for the resort, and next steps, including public and agency consultation.

Appendix B – May 11, 2020 Workshop Materials

A photograph of two hikers from behind, looking out over a vast mountain valley. The hiker on the left wears a yellow jacket and a blue cap, while the hiker on the right wears a dark jacket. Both have large backpacks and are using trekking poles. The background shows a wide valley with a town, a large body of water, and distant mountains under a clear sky. A semi-transparent white box is overlaid on the bottom half of the image, containing text.

Garibaldi Transportation Workshop

May 11, 2020

FEHR  PEERS



AGENDA

- Welcome & Introductions (10:00-10:20am)
- What We Heard From You (10:20-10:30am)
- Case Study Overview (10:30-11:00am)
- Developing a Concept for Garibaldi (11:00-11:45am)
- Next Steps (11:45am-12:00pm)





**HOW WOULD YOU DEFINE A SUCCESSFUL
TRANSPORTATION CONCEPT FOR GARIBALDI?**

WHAT WE HEARD FROM YOU

RESORT ACCESS EXPERIENCES

Positives

- Convenience:
 - Hassle free
 - Minimal Connections
- Navigability:
 - Wayfinding
 - Many modal options
 - Logical
- Navigability:
 - Clean
 - Beautiful Scenery
 - Entrance "Wow Factor"

Negatives

- Delays:
 - Bottlenecks/congestion
 - Transit not being on-time
- Complexity/Clunkiness:
 - Having to refeed parking meters
 - Overcharged (takes effort to understand)
- Discomfort:
 - Feeling unsecure
 - Having to walk from distant parking/lug bags



TRANSPORTATION STRATEGIES: OPENING DAY & BEYOND

Robust
Free
Interconnected
Micro Internal
Electric
Gondola
Bike-Rental
Multi-Faceted
Driverless

Ideas:

- E-buses internal to the resort (driverless?)
- Bike/scooter rentals
- Central Transit Drop-Off
- Gondola/Rail connection from Highway or Valley
- Transit service from Vancouver – train mentioned, but e-bus in the near term?
- Park & ride
- Rideshare capabilities
- Valet service

General Consensus:

- Car as a last option once in the resort
- Seamless and multi-faceted regional transit connections



CASE STUDIES

CASE STUDY OVERVIEW

- 16 resort communities evaluated
- 4 communities chosen for case study:
 - Park City, UT
 - Ketchum, ID
 - Aspen, CO
 - Vail, CO

Selection Criteria:

- Travel demand strategies in place
- Size of community
- Location relative to urban area
- Regional transportation infrastructure available to community



EFFECTIVENESS OF TRAVEL DEMAND MANAGEMENT STRATEGIES

Parking Demand Reduction – whether the strategy allows the community and/or resort to provide fewer parking spaces

Visitor/User Experience – a qualitative assessment of user experience, in terms of how intuitive the strategy is and how impactful it is on user experience

Environmental Footprint – discusses the strategy's performance in reducing overall driving trips and/or vehicle trip length



Parking Demand Reduction	Low	Medium	High
Visitor/User Experience	Not Appealing	Neutral	Appealing
Environmental Footprint	Low	Medium	High



PARK CITY, UT

Context:

- Serves three major ski resorts, as well as film festivals and outdoor recreation
- 600,000 overnight visitors annually
- 'Transit First' policy
- Zero emissions citywide by 2030

Comparison to Garibaldi:

Distance

- Park City: 50 km from downtown Salt Lake City
- Garibaldi: 80 km from Vancouver City Hall

Regional Connection

- Park City: 3 regional roadways
- Garibaldi: 1 regional roadway

Transit

- Park City: Robust regional transit system
- Garibaldi: Limited local transit system



TDM STRATEGIES



Free Lot to Zero-Emission Transit

Parking Demand Reduction



High

Visitor/User Experience



Appealing

Environmental Footprint



High



Dynamic Parking Pricing

Parking Demand Reduction



High

Visitor/User Experience



Neutral

Environmental Footprint



High



TDM STRATEGIES

Seasonal Shoulder-Running Bus-Only Lane

- Bus-only lane during peak season to encourage transit use
- Temporary barricades are put up to convert general purpose driving lanes into bus-only lanes

Parking Demand
Reduction



High

Visitor/User
Experience



Appealing

Environmental
Footprint



High



Drop-Off/Loading Zones in Downtown

- This strategy was not scored, as the city is still learning lessons from its implementation
- Observed decrease in drop off/loading violations for residents and resort shuttles, but not for visitors or ride-share.

KETCHUM, ID

Context:

- Serves two base areas of one major ski resort in addition to various recreational activities year-round
- Limited roadway infrastructure to/from the city provides unique travel demand issues to address

Comparison to Garibaldi:

Distance

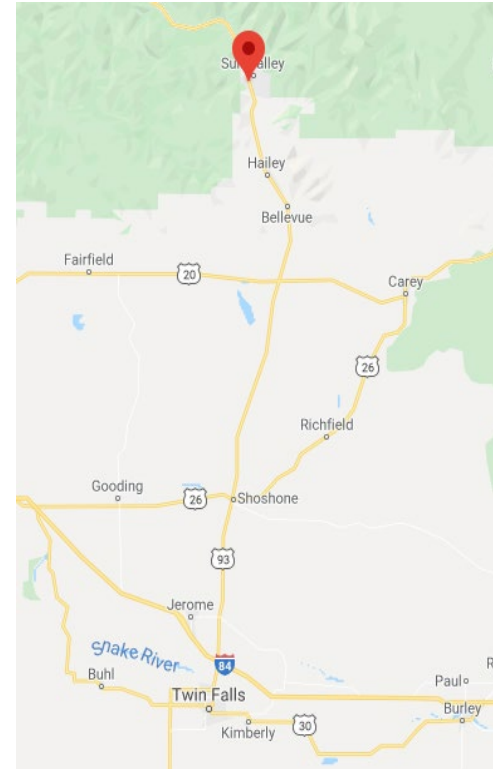
- Ketchum: 130 km from downtown Twin Falls
- Garibaldi: 80 km from Vancouver City Hall

Regional Connection

- Ketchum: 1 regional roadway (2-lane)
- Garibaldi: 1 regional roadway (2- to 4-lane)

Transit

- Ketchum: Robust regional transit system
- Garibaldi: Limited local transit system



TDM STRATEGIES



Robust Pedestrian and Bicycle Improvements

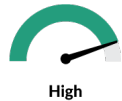
Parking Demand Reduction



Visitor/User Experience

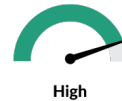


Environmental Footprint



Peak Parking Pricing

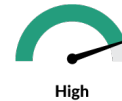
Parking Demand Reduction



Visitor/User Experience



Environmental Footprint



TDM STRATEGIES

Parking and Transportation Advisory Committee

- Vary in efficiency, but tend to enable more efficient coordination of other travel demand management strategies between public and private entities
- In the case of Garibaldi, would enable coordination between resort operators, Squamish Nation, MITI, provincial government, as well as other Sea-to-Sky Corridor municipalities and communities



Bike-Share Service

- This strategy was not scored, as the city has ended up discontinuing the service after only minor success
- It was found that most visitors didn't opt to use the bike-share service
- In the case of Garibaldi, bike-share service would likely have to be e-bikes.



ASPEN, CO

Context:

- Serves four major ski resorts, in addition to other year-round recreation activities, including the X-Games
- Four Aspen ski resorts received 1.5 million visitors in 2019 alone
- Layered service approach that emphasizes providing diverse transportation options
- Goal to reduce communitywide emissions 80% by 2050

Comparison to Garibaldi:

Distance

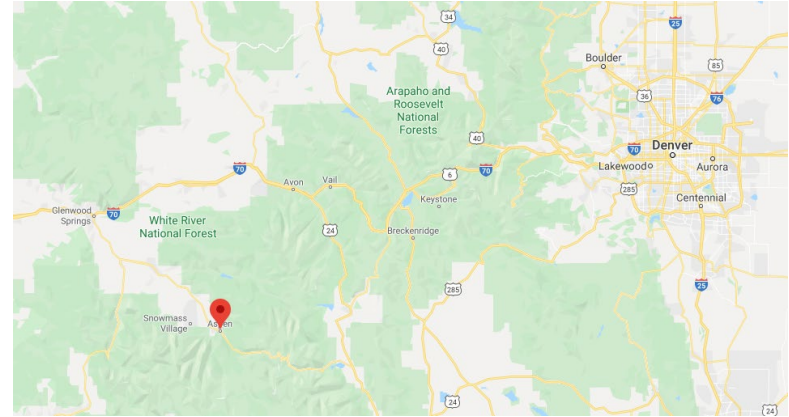
- Aspen: 200 km from downtown Denver
- Garibaldi: 80 km from Vancouver City Hall

Regional Connection

- Aspen: 1 regional roadway (4-lane)
- Garibaldi: 1 regional roadway (2- to 4-lane)

Transit

- Aspen: Robust regional transit system
- Garibaldi: Limited local transit system



TDM STRATEGIES



Fare-Free Transit

Parking Demand Reduction



High

Visitor/User Experience



Appealing

Environmental Footprint



High



Dynamic Parking Pricing

Parking Demand Reduction



High

Visitor/User Experience



Neutral

Environmental Footprint



High

TDM STRATEGIES



Micro Transit (Downtowner)

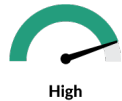
Parking Demand Reduction



Visitor/User Experience

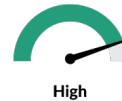


Environmental Footprint



Carpool Permitting Program

Parking Demand Reduction



Visitor/User Experience



Environmental Footprint



VAIL, CO

Context:

- Serves the Vail Resort with its various accesses, in addition to being a hub for year-round recreation
- 3.2 million annual visitors, with 2/3 during the winter season
- 'Park once' goal
- Vail focuses on providing transportation alternatives for once visitors arrive

Comparison to Garibaldi:

Distance

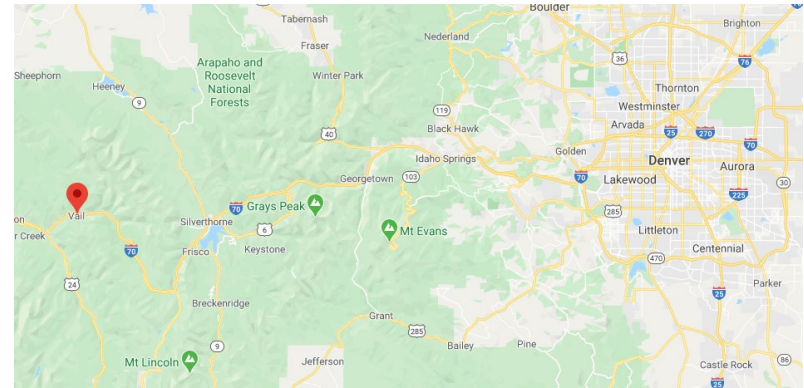
- Vail: 160 km from downtown Salt Lake City
- Garibaldi: 80 km from Vancouver City Hall

Regional Connection

- Vail: 1 regional roadway (6-lane)
- Garibaldi: 1 regional roadway (2- to 4-lane)

Transit

- Vail: Robust local transit system
- Garibaldi: Limited local transit system



TDM STRATEGIES



Free Hybrid/Electric Transit with Perimeter Seating

Parking Demand Reduction



High

Visitor/User Experience



Appealing

Environmental Footprint



High



Dynamic Parking Pricing

Parking Demand Reduction



High

Visitor/User Experience



Neutral

Environmental Footprint



High



TDM STRATEGIES

Parking and Transportation Advisory Committee

- Vary in efficiency, but tend to enable more efficient coordination of other travel demand management strategies between public and private entities
- In the case of Garibaldi, would enable coordination between resort operators, Squamish Nation, MITI, provincial government, as well as other Sea-to-Sky Corridor municipalities and communities

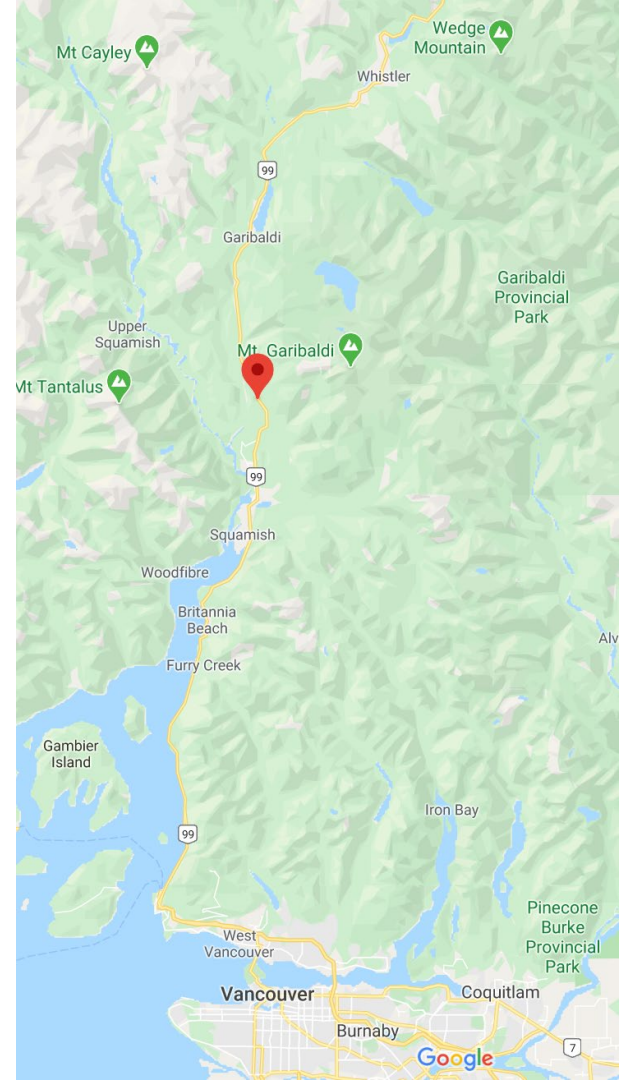


DEVELOPING A CONCEPT FOR GARIBALDI

DEVELOPING A CONCEPT FOR GARIBALDI

Measures to consider

- ✓ Timeline
- ✓ Spatial considerations
- ✓ Implementation needs



NEXT STEPS FOR DEVELOPING CONCEPT REPORT



Over the next 4 weeks, develop a **transportation concept** that both **highly accessible & ecologically-minded**.

What **elements** would you like to see?



Menu:	Opening Day:	Near-Term:	Long-Term:
Gondola/Rail from Valley/hwy -People Mover Gondolas within Village	E-buses/Equivalent internal to the resort E-Micro Transportation Network -Potential micro transportation pass?	Bus service from Vancouver -Private bus service/Sky Train system in place that can be leveraged	Ferry Service to Squamish from Vancouver Canoes from Horseshoe Bay
Park & Rides	Dynamic Wayfinding (Apps) -Incentives attached to apps	-Incentivized in Lift Ticket? -Important to incorporate public aspect to transit service	
Valet service	-Gamification	-Ensure good bus service with comfortable headways	
Autonomous Vehicle Infrastructure	Good Resort Design (Central Transit Drop-Off) -Goal to ensure transit trips are equal/more convenient than parking	Rail From Lower Mainland -CN Rail Line	
E-Carts	-Onsite Lockers -Bicycle/Hiking Incentives	Transportation Hub in Lower Mainland	
	Transportation Advisory Committee (Participation)	Gondola from Highway to Village -Need to ensure that addresses congestion	
	Parking Disincentives (Paid Parking) -Carpool incentives -Rideshare capabilities	-Some challenges due to utility lines	
	Data Management/Data Collection Process -Traffic monitoring		
	Transportation/Parking Bundled with Tiered Lift Ticket		

Appendix C – EA Certificate Condition

#11

**GARIBALDI AT SQUAMISH PROJECT
(PROJECT)**

SCHEDULE B

**TABLE OF CONDITIONS
FOR
AN ENVIRONMENTAL ASSESSMENT CERTIFICATE**

December 16, 2015

DEFINITIONS	
Construction	The phase of the Project during which physical activities in connection with site preparation, building or installation of any component of the Project occurs. For purposes of these conditions, Construction does not include any investigative use or testing conducted prior to commencement of site clearing.
Existing Well	Has the meaning given to such term in Condition 5.
Holder	Has the same meaning as defined in the Environmental Assessment Certificate.
Main Pumping Well	Consists of at least two wells (one well to be a standby well for maintenance purposes and/or alternate pumping).
Observation well OBS-1	A well, in the vicinity of the Original Location to monitor the Paradise Valley Aquifer at coordinates N 5521135.175, E 488666.713.
Operations	Operations commences when the first lift ticket is sold.
Original Location	Original location of the Main Pumping Well described in Chapter Five of the Supplemental Application.
Park Plans	2002 Alice Lake Purpose Statement and Zoning Plan and the 1990 Garibaldi Provincial Park Master Plan.
Piteau, 2014	Garibaldi at Squamish Hydrogeological Investigation for Groundwater Supply- Cheakamus River Valley, Squamish, BC, Draft Report, prepared by Piteau Associates Engineering Ltd., October 2014.
Project	The project as described in the Certified Project Description.
Pumping Commencement	Has the meaning given to such term in Condition 5.
Qualified Professional	An applied scientist or technologist specializing in an applied science or technology applicable to the duty or function, including, if applicable and without limiting this, archaeology, agronomy, biology, chemistry, forestry, engineering, geology, hydrology or hydrogeology, relevant to the field of practice set out in the condition; and who is registered with the appropriate professional organization in the Province of BC, is acting under that organization's code of ethics and is subject to disciplinary action by that organization.
Replacement Wells	Has the meaning given to such term in Condition 5.
Spring Season	March 1 - April 31
Summer Season	May 1 - November 14
Supplemental Application	Supplemental Application from Garibaldi at Squamish Inc., dated April 30, 2015, to the Environmental Assessment Office applying for an Environmental Assessment Certificate.
Winter Season	November 15 - February 28

ACRONYMS

AEMP	Aquatic Effects Monitoring Plan	FLNR	Ministry of Forests, Lands and Natural Resource Operations
amsl	above mean sea level		
BC	British Columbia	HLTH	Ministry of Health
BREMP	Biodiversity Retention Environmental Management Plan	l/s	litres per second
		LWMP	Liquid Waste Management Plan
BRMP	Brohm River Monitoring Plan	MoE	Ministry of Environment
CEMP	Construction Environmental Management Plan	MRB	Mountain Resorts Branch
		MWR	Municipal Wastewater Regulation
COPC	chemicals of potential concern		
CPD	Certified Project Description	OGMA	Old Growth Management Area
DFCC	Dam Failure Consequence Classification	PVCA	Paradise Valley Community Association
DFO	Fisheries and Oceans Canada	QP	Qualified Professional
		QPA	Qualified Professional Archaeologist
DOS	District of Squamish	RRA	Relevant regulatory Authority
EA	Environmental Assessment	SWMP	Solid Waste Management Plan
EAC	Environmental Assessment Certificate		
EAO	Environmental Assessment Office	TEKARP	Traditional Ecological Knowledge Acquisition and Retention Plan
EMP	Environmental Management Plan		
		WFS	British Columbia Wildfire Services

TABLE OF CONDITIONS

No.	Condition
1	<p>Plan Development</p> <p>Where a condition of this EAC requires the Holder to develop a plan, program or other document, any such plan must include, at a minimum, the following information:</p> <ul style="list-style-type: none"> • Purpose and objectives of the plan, program and document; • Roles and responsibilities of the Holder; • Roles and responsibilities of project personnel and contractors; • Schedule for implementing the plan, program and document throughout the relevant Project phases; • Monitoring programs and schedules designed to evaluate the effectiveness of mitigation measures; • Adaptive management plan to address effects of constructing or operating the Project if those effects: <ul style="list-style-type: none"> ○ are not mitigated to the extent contemplated in the Application; or ○ are not predicted in the Application. • Schedules and methods for the submission of monitoring reports to be provided to specific agencies, Squamish Nation and the public and the required form and content for those reports; and • Process and timing for reviewing and updating the plan, program and document, including any consultation with agencies and Squamish Nation that would occur in connection with such updates and revisions.
2	<p>Consultation</p> <p>Where a condition of this EAC requires the Holder to consult a particular party or parties regarding the content of a plan, program or document, the Holder must:</p> <p>(a) provide written notice to each such party that:</p> <ul style="list-style-type: none"> • includes a copy of the plan, program or document ; • invites the party to provide its views on the content of such plan, program or document; and • indicates: <ul style="list-style-type: none"> ○ if a timeframe providing such views to the Holder is specified in the relevant condition of this EAC, that the party may provide such views to the Holder within such time frame; or ○ if a timeframe providing such views to the Holder is not specified in the relevant condition of this EAC, specifies a reasonable period during which the party may submit such views to the Holder; <p>(b) undertake a full and impartial consideration of any views and other information provided by a party in accordance with the timelines specified in a notice given pursuant to paragraph (a);</p>

	<p>(c) provide a written explanation to each party that provided comments in accordance with a notice given pursuant to paragraph (a) as to:</p> <ul style="list-style-type: none"> • how the views and information provided by such party to the Holder received have been considered and addressed in a revised version of the plan, program or document ; or • why such views and information have not been addressed in a revised version of the plan, program or document ; <p>(d) maintain a record of consultation with each such party regarding the plan, program or document; and</p> <p>(e) provide a copy of such consultation record to the EAO, the relevant party or both, promptly upon the written request of the EAO or such party.</p>
3	<p>Satisfaction of Agencies</p> <p>Where a condition of this EAC requires the Holder to develop a plan, program or document to the satisfaction of one or more agencies (which may include the EAO), after submitting a draft of the plan, program or document to the agency or agencies listed in the relevant condition the Holder will not need to make further revisions to such plan, program or document unless any such listed agency communicates to the Holder that further revisions to such plan, program or document are required. Any such required changes must be pursued by the Holder in a manner that is acceptable to EAO and in accordance with any timelines specified by EAO.</p>
4	<p>Water Supply</p> <p>(a) Subject to paragraph (b) The Holder must not withdraw, from the Paradise Valley Aquifer, more than:</p> <ul style="list-style-type: none"> (i) 90 l/s, measured on a daily basis during the Winter Season; (ii) 54 l/s, measured on a daily basis during the Spring Season; and (iii) 35 l/s, measured on a daily basis during the Summer Season. <p>(b) The Holder may apply to EAO for approval to increase withdrawal rates from the Paradise Valley Aquifer by up to 20 l/s during the Spring Season and/or Summer Season by preparing and delivering to EAO:</p> <ul style="list-style-type: none"> (i) a water conservation plan developed in consultation with Paradise Valley Community Association (PVCA); and (ii) a report setting out the results of the groundwater monitoring completed under Condition 6, <p>that are to the satisfaction of EAO.</p> <p>The Holder must not increase the withdrawal rates in paragraph (a) unless approved in writing by EAO. If increased withdrawal is approved by EAO, the Holder must implement the water conservation plan prior to increasing the withdrawal rate.</p> <p>(c) The Holder must, prior to withdrawal of any water from the Paradise Valley Aquifer:</p> <ul style="list-style-type: none"> (i) cause a QP to develop a Groundwater Protection Action Plan in consultation with PVCA and FLNR that outlines the specific measures the Holder will undertake to achieve maximum reduction of water use in relation to the Project; and (ii) obtain the approval of FLNR for such Groundwater Protection Action Plan.

	<p>(d) If, pursuant to Condition 9, the Main Pumping Well is located at the Original Location and the groundwater level at observation well OBS-1 falls below the Holder's predicted minimum geodetic water level at OBS-1¹ during the Summer Season, the Holder must, within three days of learning of such water level, implement the Groundwater Protection Action Plan referred to in paragraph (c).</p> <p>(e) If, pursuant to Condition 9, the Main Pumping Well is located at a location other than the Original Location, the Holder must:</p> <ul style="list-style-type: none"> (i) Prior to Pumping Commencement, retain a QP to direct the location and installation of a monitoring well to be used as an alternative to OBS-1; (ii) install such alternative monitoring well prior to Pumping Commencement; (iii) cause such QP to develop a numerical groundwater model that predicts the minimum geodetic water level at such alternative monitoring well in response to seasonal pumping at the alternative Main Pumping Well prior to the commencement of pumping operations; and (iv) if, during the Summer Season, the groundwater level at such alternative monitoring well drops below the predicted minimum geodetic water level for such well, within three days of learning of such water level, implement the Groundwater Protection Action Plan referred to in paragraph (c). <p>(f) Prior to Pumping Commencement and during Operations, the Holder must develop a public, online information website which shows, at a minimum:</p> <ul style="list-style-type: none"> (i) Daily pumping rate of the Main Pumping Well; and (ii) Live monitoring results (geodetic water level) of the observation well referred to in paragraph (d) or (e), as applicable. <p>(g) The Holder must monitor pumping rate and live monitoring results under paragraph (f) on a daily basis to ensure that the Holder is aware of groundwater levels for the purpose of paragraph (d) and (e), as applicable.</p>
5	<p>Replacement Wells</p> <p>(a) Prior to the Holder commencing pumping operations which would remove groundwater from the Paradise Valley Aquifer (Pumping Commencement), the Holder must identify all wells existing which are within both:</p> <ul style="list-style-type: none"> (i) a 2 kilometre radius of the Main Pumping Well for the Project; and, (ii) the Paradise Valley Aquifer or the Cheakamus Valley (each an Existing Well) as of the date of this EAC, and measure the available drawdown in each Existing Well. <p>(b) If an Existing Well does not have an available drawdown that exceeds:</p> <ul style="list-style-type: none"> (i) the documented drawdown referenced in Paragraph 5(a)(ii) (ii) plus: <ul style="list-style-type: none"> 1. if, pursuant to Condition 9, the Main Pumping Well is located at the Original Location, four metres below 55.2 metres amsl, i.e. the lowest predicted water level at the location of the subject well, based on the drought scenario predicted for mid-November in Piteau, 2014; or 2. if, pursuant to Condition 9, the Main Pumping Well is located at a location other

¹ monthly predicted geodetic groundwater level at OBS-1 for seasonal pumping scenario for drought condition recharge (see top right panel in Figure G-2 in Piteau, October 2014).

	<p>than the Original Location, a depth below the lowest predicted water level at the subject well, as determined by a QP retained by the Holder in a manner consistent with the methodology used in Piteau, 2014, then the Holder must make reasonable efforts to offer to the owner or operator of such Existing Well to drill a new well and install associated infrastructure such as pumps and wiring (each a Replacement Well), which in the case of domestic wells, will not exceed six inch pipe diameter. For greater certainty, if the Main Pumping Well is located at a location other than the Original Location, the Holder must cause a QP to complete the modeling contemplated in Paragraph 5(b)(ii)(2) prior to Pumping Commencement.</p> <p>(c) The Holder must make reasonable efforts to deliver offers of Replacement Wells pursuant to paragraph (b) at least six months prior to the Holders planned date of Pumping Commencement. The Holder must cause all Replacement Wells for which it received accepted offers at least three months prior to Pumping Commencement to be installed and operational by the date of Pumping Commencement.</p> <p>(d) Prior to Pumping Commencement, the Holder must provide EAO with a report which:</p> <ul style="list-style-type: none"> (i) provides a map of the Existing Wells which meet the criteria in Paragraph 5(b) (ii) the name and address of each owner or operator of an Existing Well who was offered a Replacement Well; and (iii) the current operating status of each Replacement Well that the Holder caused to be installed pursuant to this condition.
6	<p>Groundwater Research and Monitoring Plan</p> <p>The Holder must cause a QP to develop, and the Holder implement throughout Construction and Operations, a groundwater research and monitoring plan which, at a minimum, contains the following elements:</p> <ul style="list-style-type: none"> (a) groundwater level and quality monitoring at a minimum of six monitoring wells to be installed by the Holder within two years of this EAC as follows: <ul style="list-style-type: none"> (i) two wells, with one approximately 200 metres upgradient and the other approximately 200 metres downgradient of the Main Pumping Well; (ii) two wells, with one approximately 1000 metres upgradient and the other approximately 1000 metres downgradient of the Main Pumping Well; and (iii) the two wells required under Condition 7. (b) a monitoring program for Swift Creek which will monitor water stage and flow on a quarterly basis; and (c) a requirement for the Holder to submit an annual report to EAO, FLNR, DOS and Squamish Nation by December 15 of each year, that describes the results of monitoring under Paragraphs (a) and (b) for the preceding 12 complete months. <p>The Holder must obtain approval of EAO and FLNR for the groundwater research and monitoring program prior to (i) the third anniversary of this EAC, or (ii) the commencement of Construction, whichever comes first. The Holder must implement the program consistent with the timelines set out in the program and prior to Pumping Commencement.</p>

7	<p>Fish and Fish Habitat in Side Channels</p> <p>The Holder must, prior to (i) the third anniversary of this EAC or (ii) the commencement of Construction, whichever comes first, cause a QP to complete and deliver to EAO a written study that determines potential adverse effects from the construction and operation of the groundwater pumping aspect of the Project on the fish and fish habitat in the side channels located between the Tenderfoot Hatchery and the North Vancouver Outdoor School as illustrated in Figure 3 in the CPD. The study must, at a minimum, include the following components:</p> <ul style="list-style-type: none"> (a) an investigation into the seasonal use of the side channels by anadromous and non-anadromous fish and benthic invertebrates; (b) an investigation into the sources of water which supply the side channels (surface water or groundwater) and the various contributions of those sources, including, but not limited to, the water sources during late summer drought conditions; (c) the installation of a minimum of two groundwater monitoring wells that will be monitored by the Holder in order to provide primary information to support the study described in this condition; and (d) an assessment of the role of the Cheakamus River in supplying water to the side channels. <p>Prior to commencing this study, the Holder must (i) consult with FLNR, DOS, DFO, PVCA and Squamish Nation on the scope of work of the study, including the location of the groundwater wells and (ii) obtain the approval of EAO for the scope of work included in the study.</p> <p>If the study results demonstrate that mitigation actions are required to ensure that adverse effects on fish and fish habitat do not occur, the Holder must consult with FLNR, DFO, PVCA and Squamish Nation and cause a QP to develop and implement a Side Channels Fish and Fish Habitat Management Plan within timelines and in a manner that are to the satisfaction of EAO.</p>
8	<p>Snowmaking Reservoir</p> <p>The Holder must not use any groundwater withdrawn from the Paradise Valley Aquifer to fill the Project's snowmaking reservoir during the Summer Season.</p>
9	<p>Location of the Main Pumping Well</p> <p>Prior to (i) the third anniversary of this EAC, and (ii) the commencement of Construction, whichever comes first, the Holder must:</p> <ul style="list-style-type: none"> (a) in addition to the proposed Original Location of the Main Pumping Well, identify at least two different alternative locations for the Main Pumping Well with a view to locating the Main Pumping Well in a manner that will minimize or eliminate the noise, safety and aesthetic effects from the construction and operation of the Main Pumping Well on persons resident in the Paradise Valley as of the date of this EAC; (b) consult with the DOS, FLNR, Squamish Nation and PVCA regarding their respective

	<p>views on the potential effects of alternative locations identified by the Holder pursuant to paragraph (a); and</p> <p>(c) submit to EAO and DOS a report, in a form satisfactory to EAO, that includes, among other things:</p> <ul style="list-style-type: none"> (i) a revised effects assessment that compares the predicted effects of the alternative locations identified by the Holder pursuant to paragraph (a) to the predicted effects of the Original Location described in Chapter Five of the Supplemental Application; (ii) a summary of the consultations carried out pursuant to paragraph (b), including a consultation log and summary of the views expressed by DOS, FLNR, Squamish Nation and PVCA during such consultations; and (iii) the Holder's views as to whether the Original Location or any of the alternative locations described by the Holder pursuant to paragraph (a) are preferred in terms of (A) technical viability, (B) overall predicted effects, and (C) acceptability to the Holder, and (D) the views of DOS, FLNR, Squamish Nation and PVCA. <p>If the EAO provides written notice to the Holder of the required location of the Main Pumping Well within 60 days of receipt of such report, the Holder must locate, construct and operate the Main Pumping Well and locate the associated pipeline in accordance with any such direction by EAO. If EAO does not provide any such direction, the Holder must locate the Main Pumping Well at the Original Location subject to any changes required by EAO to minimize adverse impacts on fish and persons resident in the Paradise Valley.</p>
10	<p>Secondary Source of Water</p> <p>The Holder must identify a source of water that is capable of being used as an alternative to the Paradise Valley Aquifer at the rates set out in Condition 4 for a period of at least three weeks in the event of emergency.</p> <p>The Holder must, prior to (i) the third anniversary of this EAC, or (ii) the commencement of Construction, whichever happens first provide a report to FLNR that demonstrates that such alternative source will remain available to the Project and is capable of supplying water to the Project at the rates set out in Condition 4 for at least three weeks during each emergency that prevents the Holder from, or requires the Holder to cease, drawing water from the Paradise Valley Aquifer during the life of the Project.</p> <p>The Holder must not commence Construction until FLNR has approved the Holder's emergency use of such alternative water source.</p>
11	<p>Transportation</p> <p>The Holder must, prior to the start of Operations, develop a Transportation Plan in consultation with the Ministry of Transportation and Infrastructure, DOS, and SLRD relating to transportation requirements for the Project. The Plan must address the movement of people and materials within the Project site, and to and from the Project. The Plan must be developed to the satisfaction of FLNR. The Plan must be implemented throughout Operations.</p>

	<p>The Plan must include specific actions or protocols to:</p> <ul style="list-style-type: none"> ▪ move people and goods safely and efficiently; ▪ provide for multi-modes of transportation; ▪ promote the use of walkways and bike paths for transportation within the resort development; and ▪ support environmentally sensitive transportation modes and practices. <p><u>Plan Components</u> Plan components will:</p> <ul style="list-style-type: none"> ▪ detail steps and actions to manage transportation demands, including integration with existing and/or future traffic congestion notification systems and implementation of transportation hubs to facilitate mass transit and ride sharing; ▪ describe plans for the Highway 99 interchange; and, ▪ identify measures to minimize air quality impacts from vehicle exhaust based on the Air Quality Plan. <p><u>Plan Management and Linkages</u> The Plan will develop short term (zero to five years), mid-term (six to ten years), and long-term (great than ten years) goals and measures.</p> <p>The Plan must reflect the DOS Transportation Plan and recommendations in the DOS 2031 District Wide Multi-Modal Transportation Study Report #2 Final Transportation Plan (September 2011) and finalized BC Transit Sea to Sky Transit Future Plan, or as such documents are revised and replaced from time to time.</p>
12	<p>Environmental Monitor</p> <p>Prior to commencing Construction, the Holder must retain the services of a QP as an environmental monitor with demonstrated experience and knowledge of environmental monitoring for construction projects in BC (Environmental Monitor). The Holder must give the Environmental Monitor the authority to stop Project work or a portion of Project work to the extent that the Environmental Monitor determines it necessary to prevent or reduce adverse effects from non-compliance with the terms and conditions of this EAC.</p> <p>The Environmental Monitor must be retained by the Holder throughout Construction. Prior to commencing Construction, the Holder must ensure that the Environmental Monitor's terms of engagement require the Environmental Monitor to conduct site inspections at a frequency and schedule that is acceptable to EAO.</p> <p>The Holder must notify EAO of any non-compliance with the EAC within 72 hours of the Holder becoming aware of any such non-compliance. The Holder must ensure that the Environmental Monitor prepares and delivers to the Holder, monthly reports on the Holder's compliance with the terms and conditions of the EAC. These reports must be retained by the Holder through Construction and for five years after commencing Operations. The Holder must provide any such reports to any government agency upon request.</p>

13	<p>Recreation Sites and Trails Plan</p> <p>The Holder must prepare, to the satisfaction of FLNR, a plan (the “Recreation Sites and Trails Plan”) for Construction and Operations.</p> <p>The Plan must include specific actions to:</p> <ul style="list-style-type: none"> (a) Enhance connectivity of trails that link the Project to recreational amenities, trails and other significant recreation features in the Sea to Sky Corridor excluding Garibaldi Provincial Park; and (b) Maintain and enhance public access to and use of recreation features located within the Project site. <p>The Plan must ensure there is no net loss of recreational trails within the Project area and must be consistent with any plans developed through or contemplated within Conditions 15, 22, 37 and 38.</p> <p>The Plan must be completed in a manner and on a timeline as specified by EAO.</p> <p>The Holder must develop the Plan in consultation with DOS, SLRD, BC Parks and Squamish Nation. The Holder must also consult with the public on the Plan in a manner consistent with a Public Consultation Plan. The Holder is required to provide the Public Consultation Plan to DOS for review and approval.</p> <p>The Public Consultation Plan and Recreation Sites and Trails Plan must be implemented during Construction and Operations.</p>
14	<p>Helicopter Use</p> <p>The Holder must not carry out or permit to be carried out helicopter tours or helicopter skiing in the Certified Project Area.</p>
15	<p>Access</p> <p>The Holder must not construct or advertise any access routes from the Project into Alice Lake or Garibaldi Provincial Parks prior to the completion of an approved amendment or replacement to the 2002 Alice Lake Purpose Statement and Zoning Plan and the 1990 Garibaldi Provincial Park Master Plan (together, the Park Plans) which would permit such use and access.</p> <p>If BC Parks amends or replaces the Parks Plans to allow access to Alice Lake or Garibaldi Provincial Parks from the Project, the Holder must develop and implement an access monitoring protocol within one year, for review and approval by BC Parks, which will measure and monitor the effect of resort development and operation on recreational demand and the resulting impacts to Alice Lake and Garibaldi Parks.</p> <p>Prior to the commencement of Operations, the Holder must also develop and implement a plan that provides measures to mitigate the potential impacts of increased access and</p>

	visitation on Alice Lake and Garibaldi Provincial Parks. The Holder must obtain BC Parks' approval of this plan. The plan must be implemented according to direction provided by BC Parks.
16	<p>Garibaldi Provincial Park</p> <p>The Holder must not develop or construct any facilities or infrastructure within 100 metres of Garibaldi Provincial Park until a formal amendment of the Garibaldi Provincial Park Master Plan is approved by BC Parks and such access is a component of that plan.</p>
17	<p>Construction Environmental Management Plan</p> <p>The EAC Holder must retain a QP to develop a Construction Environmental Management Plan. The Plan must be developed in consultation with MOE, FLNR and the Squamish Nation.</p> <p>The Construction Environmental Management Plan must include at least the following:</p> <ul style="list-style-type: none"> • conformance and effectiveness monitoring requirements and specification of when corrective action must be undertaken; and, • reporting requirements (including timeframe). <p>The Construction Environmental Management Plan must include, at a minimum, component plans to address:</p> <ul style="list-style-type: none"> • Air Quality Plan; • Aquatic Effects Monitoring Plan; • Archaeology Plan; • Biodiversity Retention Plan; • Brohm River Monitoring Plan; • Emergency Response Plan; • Erosion and Sediment Control Plan; • Spill Contingency and Management Plan; and, • Fertilizer and Pesticide Management Plan. <p>The EAC Holder must provide the Construction Environmental Management Plan to MOE, FNLNR and Squamish Nation for review a minimum of 90 days prior to the planned commencement of construction.</p> <p>The EAC Holder must provide the updated Plan to MOE, FNLNR and Squamish Nation a minimum of 30 days prior to the commencement of construction.</p> <p>The EAC Holder must develop the Plan and component plans, and any amendments, to the satisfaction of EAO.</p>
18	<p>Aquatic Effects</p> <p>The Holder must, prior to (i) the third anniversary of this EAC or (ii) the commencement of Construction, whichever comes first develop an Aquatic Effects Monitoring Plan (AEMP), in consultation with Squamish Nation, Ministry of Environment (MoE), DOS and SLRD. The AEMP must be developed by a QP. The Holder must implement the AEMP during</p>

Construction and Operations to the satisfaction of MoE. The Holder must not start Construction until the AEMP is approved by MoE.

The goal of the AEMP must be to investigate and detect potential environmental effects in the aquatic receiving environment that may result from Project activities and provide adaptive management to mitigate the effects.

The AEMP must be designed to include any point-source discharge from the municipal waste water treatment systems as well as the potential effects of any Project-related Construction and Operations activities that a QP determines have the potential to adversely affect aquatic environments. The AEMP must be developed in a manner that will allow both local and regional scale environmental effects of the Project to be identified and mitigated. Monitoring to meet provincial legislative requirements must be integrated into the AEMP.

The AEMP must include specific actions or protocols to:

- detect any unexpected effects of the Project and emerging environmental trends as measured against baseline conditions;
- identify the potential cause-effect relationship between Project activities and any predicted or unexpected adverse effects to the Valued Components included in the Supplemental Application;
- provide data for the development of any adaptive management and mitigation strategies; and
- ensure compliance with discharge and receiving environment regulations and criteria and applicable permits and authorizations.

Plan Components

The AEMP must include at a minimum:

- a conceptual site model to aid in the identification of potential COPC that may be released into the aquatic environment from the Project during Construction and Operations including their fate or exposure pathways (including but not limited to treated wastewater, storm drain run-off), and receptors for the COPC in the aquatic receiving environment;
- a summary of the potential effects of the Project to fish and aquatic habitat that were identified in the EA for the Project; and
- a summary of mitigation measures in section 6.4.4 of the Supplemental Application.

The AEMP must include baseline and monitoring throughout Construction and Operations of any aquatic environments that the QP determines may be affected by the Project, including but not limited to:

- surface water quantity;
- surface water chemistry;
- sediment volume, suspended sediment concentrations and chemistry;

- primary producers;
- benthic invertebrates;
- fish; and
- water temperatures for the Brohm, Swift and Cheakamus Rivers (as well as tributaries as identified by the QP developing the plan) which may be affected by Project Construction and Operations.

Monitoring and Adaptive Management Program Design, Sampling Methods, and Analysis

Monitoring locations for the factors listed above will be selected in consultation with MoE, Squamish Nation, DFO, DOS and SLRD. The AEMP must contain, at a minimum the, following:

- monitoring and adaptive management program design, including:
 - identification of monitoring locations on the Brohm, Swift and Cheakamus Rivers, and tributaries;
 - sampling frequency;
 - list of parameters or variables to be measured;
 - laboratory analytical methods; and,
 - reportable detection limits for laboratory analyses;
- sampling methodologies including equipment, sample collection, handling, and transport, and Quality Assurance/Quality Control methods, consistent with the current version of the:
 - British Columbia Field Sampling Manual; or as amended or replaced from time to time ;
 - Environmental Data Quality Assurance Regulation (BC Reg. 301/90) or as amended or replaced from time to time ; and,
 - Other equivalent guidance documents, as acceptable to MoE;
- statistical analysis to be used, including but not limited to before-after-control-impact, trend analysis; and
- identification of triggers for additional mitigative action.

Management Response

An adaptive management approach must be implemented under the AEMP to facilitate the implementation of early mitigation strategies before concentrations COPC in the aquatic receiving environment approach levels where the QP determines adverse effects may occur. The AEMP must identify monitoring and management strategies in order to meet the objectives of the AEMP and must be consistent with the following documents, as updated or replaced from time to time:

- BC Ambient Water Quality Guidelines (approved and working guidelines);
- Guideline for the Derivation and Application of Water Quality Objectives in British Columbia (2013);
- Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Aquatic Life (1987); and,
- other equivalent guidance documents acceptable to MoE.

	<p><u>Reporting Summary</u></p> <p>The Holder must include in the AEMP a summary of baseline data collected during the pre-construction phases including, but not limited to, historical data, data to support environmental assessment, and ongoing pre-construction monitoring) in order to establish the foundation for comparison of monitoring data to baseline conditions. Raw pre-Construction baseline data must be provided in appendices of the AEMP.</p> <p>The Holder must include in the AEMP specific reporting and notification actions and timelines, including a description of the required contents of any such reports, reporting frequency, and report distribution. The Holder must provide reports produced under the AEMP to EAO, MoE, Squamish Nation, DOS, SLRD and DFO at the request of those groups.</p>
19	<p>Brohm River</p> <p>The Holder must cause a QP to develop and implement a Brohm River Monitoring Plan (BRMP) in consultation with Squamish Nation, MoE, FLNR, DOS and SLRD. The BRMP must be developed to the satisfaction of FLNR. The BRMP must be developed prior to the start of Construction and must be implemented during Construction and Operations.</p> <p>The primary goal of the BRMP must be establish actions and protocols to understand, investigate and detect potential environmental effects in the Brohm River that result or have the potential to result from the Construction and Operations, including, but not limited to effects to fisheries resources in the Brohm River.</p> <p>The monitoring program must be designed to establish an accurate baseline of the riverine environmental attributes (including but not limited to geomorphology, riparian area structure and fisheries resources) and human use of the Brohm River in order to monitor Construction and Operations and to develop adaptive strategies to reduce, mitigate or eliminate potential effects on the riverine environment.</p> <p>The BRMP must include specific actions or protocols to:</p> <ul style="list-style-type: none"> • detect any Construction and Operations effects on the Brohm River or emerging environmental trends associated with resort development as measured against baseline conditions; • assist in identifying the potential cause-effect relationship between Construction and Operations and any environmental effects to the aquatic receiving environment of the Brohm River; and • provide data for the development of adaptive management and mitigation strategies if effects are detected. <p><u>Plan Components</u></p> <p>The BRMP must contain, at a minimum include, the following pre-development baseline information:</p> <ul style="list-style-type: none"> • a baseline inventory of the riverine geomorphology and hydrology of the Brohm River, including but not limited to riffles, pools, stability and type of substrates, cascades, and flow regimes;

- a baseline inventory of riparian area attributes of the Brohm River, including but not limited to coarse woody debris, function of debris jams and riparian vegetation;
- a baseline inventory of benthic invertebrates in the Brohm River, to be taken from the approved AEMP;
- a baseline inventory of fish habitats (identifying each life stage of fish species and the known times when each life-stage or activity is occurring in each monitored river, tributary or wetland);
- a baseline inventory of water quality and quantity in the Brohm River, to be taken from the approved AEMP; and
- existing public recreational use on the Brohm River, including, but not limited to rod days and angler effort.

The BRMP will describe monitoring throughout Construction and Operations related to how resort development may affect:

- surface water quantity and chemistry;
- sediment chemistry, sediment volume and suspended sediment concentrations;
- primary producers;
- benthic invertebrates;
- coarse woody debris;
- fish and fish habitat;
- water temperature in the Brohm and any identified key tributaries;
- recreational angler use; and
- other recreational use such as trails and swimming in or at the Brohm River.

Monitoring and Adaptive Management Program Design, Sampling Methods, and Analysis

Monitoring locations will be selected in consultation with MoE, FLNR, Squamish Nation and DOS. The BRMP must contain at a minimum the following information:

- monitoring and adaptive management program design, including:
 - identification of monitoring locations on the Brohm River and key tributaries, as identified by a QP;
 - sampling frequency;
 - list of parameters or variables to be measured;
 - laboratory analytical methods; and
 - reportable detection limits for laboratory analyses;
- sampling methodologies (including equipment, sample collection, handling, and transport), and Quality Assurance/Quality Control methods, consistent with the current version of the:
 - British Columbia Field Sampling Manual;
 - Environmental Data Quality Assurance Regulation (BC Reg. 301/90); or
 - other equivalent guidance documents, as acceptable to MoE;
- statistical analysis to be used, including but not limited to before-after-control-impact, trend analysis; and
- identification of triggers for additional mitigative action.

	<p><u>Management Response</u></p> <p>An adaptive management approach must be implemented under the BRMP in order to facilitate the implementation of early mitigation strategies before adverse effects to fish and the aquatic receiving environment occur. The BRMP must require the Holder to implement monitoring or management strategies which relate to, among other things, the operation and maintenance of resort infrastructure that the QP determines has the potential to effect the Brohm River and the placement, maintenance, communication and design of recreational trail design and access to the Brohm River.</p> <p>The BRMP must indicate areas of critical and important habitat for which the Holder will undertake action to ensure public access is restricted, as determined by EAO, in consultation with the Squamish Nation.</p> <p><u>Reporting</u></p> <p>The Holder must, on or before January 15 or every year, must cause a QP to provide to Squamish Nation, EAO and FLNR a report that summarizes:</p> <ul style="list-style-type: none"> a) Data collected under the BRMP during the preceding calendar year; b) The efforts made by the Holder to implement the various components of the BRMP during the preceding calendar year; and c) Baseline collected during the pre-construction phases, including but not limited to historical data, baseline data, and pre-construction monitoring as the foundation for comparison of future monitoring data to baseline conditions.
20	<p>Dam for Snowmaking Reservoir</p> <p>The Holder must develop a Dam Failure Consequence Classification (DFCC) for the Snowmaking Reservoir. The DFCC must be completed within three years of the issuance of this EAC or prior to the commencement of Construction, whichever happens first. The Holder must obtain the approval of FLNR for the DFCC prior the commencement of Construction.</p>
21	<p>Snowmaking Water</p> <p>Any water distribution systems used by the Holder for snowmaking purposes must be separate and independent from the Project's potable water distribution system.</p>
22	<p>Biodiversity Retention (Wildlife and Vegetation)</p> <p>The Holder must develop a Biodiversity Retention and Ecosystem Management Plan (BREMP). The Holder must not start Construction until the BREMP and subplans are approved by FLNR. The Holder must cause a QP to oversee the development and implementation of the BREMP and subplans. The BREMP must be implemented throughout Construction and Operations. The BREMP must be developed in consultation with Squamish Nation and FLNR.</p> <p>The primary goal of the BREMP must be to provide information and analysis to support an integrated, ecosystem-based approach to managing wildlife, vegetation, Squamish Nation traditional and cultural uses and resort-based activities including, but not limited to, all-season recreational use such as skiing, trail development and hiking.</p>

Plan Requirements

The BREMP must be developed in a manner which recognizes that impacts on or changes to any of the foregoing factors have the potential for both positive and negative effects on the other factors. The BREMP must ensure that vegetation loss and disturbance of ecosystems and wildlife habitat resulting from land clearing, vegetation maintenance activities and human uses associated with the Project is minimized. The BREMP must be designed to take into account the effects of Project-related activities during Construction and Operations in order to allow both local and regional scale effects to be identified and mitigated.

The Plan must include specific actions or protocols to:

- define what constitutes a natural area;
- identify remaining natural areas in the Project area;
- identify mitigation measures to avoid disruption to, and limit human use of, the remaining natural areas in the Project area;
- monitor the effects predicted in the Supplemental Application, identify mitigation measures to address Project effects on biodiversity retention and ensure mitigation measures are working as intended;
- detect any effects or emerging environmental trends as measured against baseline conditions;
- identify the potential cause-effect relationship between Construction and Operations and any environmental effects a QP determines has the potential to affect wildlife and vegetation;
- provide data for adaptive management and for the development of mitigation strategies if environmental effects are detected by the Holder;
- ensure compliance by the Holder with mitigation measures; and,
- develop effective communication materials to ensure visitors and residents of the Project are aware of potential effects on biodiversity.

The BREMP Plan must include, at a minimum, two individual Sub Management Plans:

- Wildlife Management Subplan
- Terrestrial Ecosystems and Forestry Subplan

Wildlife Management Subplan Components

The Wildlife Subplan must contain, at a minimum, the following components:

Baseline Inventory and Mapping that includes but is not limited to:

- Details on the development and implementation of Species at Risk surveys, including, but not necessarily limited to:
 - resort base development areas;
 - ski runs/lift lines;
 - reservoirs;
 - access roads; and
 - control areas to be monitored as part of the general monitoring program discussed below;

- Details on the development and implementation of a program of bat surveys which include plans to examine large caves, abandoned structures and large wildlife trees which have the potential for bat presence, including protocols for temporary suspension of construction activities and development of management response if any Townsend's big-ear bat hibernacula are located;
- Details on the development and implementation of raptor and spotted owl surveys prior to the clearing or mature and old-growth forests, including protocols for the implementation of non-disturbance buffers around active raptor nest sites;
- Details on the development and implementation of spring surveys for harlequin duck; and
- Details on the development and implementation of marbled murrelet surveys prior to commencing Construction during each breeding season consistent the inventory methods for marbled murrelet radar surveys (Resources Inventory Standards Committee (2006)) and subsequent audio-visual surveys following inventory methods for marbled murrelets in marine and terrestrial habitats (Resources Inventory Standards Committee (2001)).

Mitigation

- Details on the development and implementation of an approach to ensure slash piles and woody debris from clearing are retained and spaced at regular intervals along the edges of ski runs and provide security and thermal cover for small mammals, particularly for species such as Deer Mouse and Yellow-pine Chipmunk;
- Details on the development and implementation of how detailed site design will maintain connectivity for dispersal, movement and breeding of wildlife, reptiles and amphibians;
- Details on the development and implementation of how coarse woody debris generated during construction will be utilized to enhance fish and wildlife habitat;
- Details on the development and implementation of how potential effects to mountain goat will be mitigated during Construction and Operation of the Project, including adhering to the visual, noise, and area closure commitments made in the Supplemental Application;
- Details regarding specific designs, as well as implementation of those designs, that will prohibit the development of earthworks roads on unstable soils or soil piles that a QP determines may impact amphibian breeding and foraging habitat;
- Details on the development and implementation of an amphibian and reptile management and mitigation program, which will include protocols for amphibian surveys targeting western toad, coastal tailed frog and red-legged frog; details on the implementation of a 150 m non-disturbance vegetated buffer around known rubber boa hibernacula;
- Details on the development and implementation of how seepages, caves, talus, and other moist, rocky sites, as identified by a QP, will be protected; and
- Details on the development and implementation of a deer management program, which will include, at a minimum:
 - identification of winter range that will be protected from development;
 - options to mitigate Project-related impacts to Black-tailed deer winter

and early spring habitats, including habitat compensation opportunities; and

- specific measures to reduce and avoid vehicle/deer collisions, including but not limited to controlling vehicle speed limits by posting signs, winter road maintenance activities that allow animals to escape from the roadways, planting roadside areas with non-palatable grasses and installation of speed bumps.

Terrestrial Ecosystems and Forestry Subplan

The Terrestrial Ecosystems and Forestry Subplan must contain, at a minimum, the following components:

Inventory and Mapping

- Details on the development and implementation of ecosystem mapping of the Project area

Mitigation

- Details on how the development and implementation of road construction and associated works will avoid riparian areas such as wetlands, marshes, streams and ponds;
- Details on the development and implementation of an approach for avoiding the removal of wildlife trees, veteran trees and other trees that may be suitable for nesting, roosting, perching, roosting or feeding for raptors;
- Details regarding specific designs, and the implementation of those designs to ensure that roads and trails are aligned to one side of surface water features as opposed to bisecting them or, where such alignment is not possible due to safety, environmental or traditional use reasons, a rationale and description of mitigation methods that will be implemented in order to minimize the potential and actual adverse effects of bisecting any such surface water feature;
- Details regarding the specific methodology and implementation of a vegetation management program which will include, at a minimum, the following:
 - Measures to ensure that no more than 235 ha of old growth forest will be cleared during Construction;
 - Measures to minimize old-growth forest and natural vegetation loss at the reservoir and clearings by only clearing up to anticipated high water mark and subject to Workers Compensation Board and safety concerns;
 - Measures to avoid environmentally sensitive areas as identified by a QP including red and blue listed plants, rare plant communities and traditional plants of medicinal or cultural use and associated boundaries;
 - Measures to revegetate disturbed areas to the satisfaction of a QP with a seed mixture that is appropriate, as determined by a QP, for the biogeoclimatic zone and certified weed-free;
 - Measures to utilize native plants for landscaping and revegetation including, but not limited to replanting of native riparian vegetation

- along newly-created snow-making reservoir shorelines;
- Measures to retain natural vegetation and structural attributes in forest patches, grassland, talus and substrates surrounding the Project snow-making reservoir development sites;
- Measures to prevent degradation of habitat quality in terrestrial habitats around road, pipeline and reservoir infrastructure by controlling spills, human access, spread of exotic species and other disturbances that may result from Construction and Operations;
- Measures to evaluate the effectiveness of site restoration methods and monitor the success rate, survival and general health of the vegetation replanted in the disturbed areas. For instances where targeted survival rates are not achieved, specific measures to meet targets must be implemented to the satisfaction of FLNR and ;
- Measures to log ski runs in a manner that decreases the edge effect, including, but not limited to, “feathering” edges by retaining smaller trees near clearing and progressing toward larger trees away from ski runs and retaining the integrity of naturally occurring tree clumps;
- Measures to ensure that plant cover on disturbed sites is established before the onset of fall precipitation and ensuring that high elevations sites are re-vegetated annually in the spring to allow adequate time for vegetation growth prior to winter;
- Measures to ensure only native plants are used for landscaping purposes in commercial and residential developments, including the prohibition of the use invasive exotic species including but not limited to Scotch broom; and
- Measures to control invasive species.
- Details regarding an urban-wildfire interface prevention program.

Monitoring

The BREMP must contain a monitoring program design for both the Wildlife and Terrestrial Ecosystems subplans which will contain, at a minimum:

- identification of specific sampling and data collection areas, including sampling and data collection frequency for each of the data collection areas,
- a record the mitigation and management actions that have taken place cumulatively to date, and an analysis of their efficacy; and
- a description of sampling methodologies including equipment, sample collection, handling, and transport, and Quality Assurance/Quality Control methods, consistent with Provincial data collection standards.

Adaptive Management

An adaptive management approach must be included in the BREMP which describes how monitoring, inventory, mitigation or management actions and strategies may be modified or updated periodically and upon what information those modifications or updates will be based. The adaptive management component of the BREMP must include recognition that individual species can only be effectively managed by protecting their entire habitats, including soils, hydrologic systems, plants, and other animals, and by

	<p>understanding the relationships and linkages among the ecosystem components.</p> <p>The adaptive management program must contain, at a minimum, the following specific components:</p> <ul style="list-style-type: none"> • Details on the development and implementation of monitoring and management programs which will determine Project-related effects and mitigations for: <ul style="list-style-type: none"> ○ Mountain goat; ○ Furbearers; ○ marmots; ○ marten; ○ grizzly bears; ○ bats; ○ amphibians and reptiles; ○ birds, including harlequin duck, murrelet and raptors; ○ any small mammal species red-listed by the BC Conservation Data Centre that are found by a QP to inhabit the Project area; and ○ any avian species red-listed by the BC Conservation Data Centre that are found by a QP to inhabit the Project area. <p><u>Communication</u></p> <p>The BREMP must include details on an Education and Environmental Awareness Program which will educate Project staff and clients on appropriate and responsible behavior around wildlife and wildlife habitats in order to ensure public safety and reduce wildlife/human conflicts.</p> <p><u>Reporting</u></p> <p>The Holder must, prior to January 15 each year, provide Squamish Nation, EAO and FLNR a report that summarizes the data collected during the preceding calendar year, efforts made to implement the various components of the BREMP and a summary of the baseline data collected during the pre-construction phases, including but not limited to historical data, baseline data, and pre-construction monitoring, as the foundation for comparison of future monitoring data to baseline conditions.</p>
23	<p>Nest Management</p> <p>The Holder must not clear vegetation which has the potential to impact nesting birds, as determined by a QP, from April 1 – July 31.</p> <p>In the event that the Holder determines that the Project construction schedule requires clearing during this breeding period, the Holder must hire a QP with expertise in raptors and song birds to conduct pre-clearing nest surveys. If any raptor nests and/or active song bird nests are found prior to or during construction activities or in disturbed areas, the Holder must implement a Nest Management Plan under the supervision of a QP that includes work setbacks, limitations to disturbance, and monitoring of the efficacy of mitigation.</p>

	The Holder must develop any such Nest Management Plan to the satisfaction of FLNR and implement such plan prior to commencing construction in the vicinity of any nest.
24	<p>Black Bear and Grizzly Bear</p> <p>The Holder must develop a Black Bear and Grizzly Bear Interaction Management Plan that describes the actions that will be taken to avoid and reduce risks of potential bear-human conflicts. The plan must be developed in consultation with the Conservation Officer Service, FLNR and Squamish Nation. The Holder must obtain the approval of FLNR for the plan prior to the start of construction. The Holder must not start construction until the Plan has been approved by FLNR.</p> <p>The Plan must contain, at a minimum, the following elements:</p> <ul style="list-style-type: none"> a) A bear sighting and reporting protocol; b) A log or inventory of active bear dens within the Project area; c) Procedures to minimize sensory disturbance to hibernating bears, including but not limited to closure of ski runs or other winter uses; d) A public education program with the goal of minimizing bear-human interaction; e) Implementation of waste management procedures (e.g. placement of bear-proof garbage containers and appropriate storage of all municipal solid waste, composting and recycling) to remove attractants; f) Implementation of a site assessment monitoring program that evaluates the Project site as an attractant to bears; and g) Construction and operations staff training with the goal of minimizing bear-human interaction. <p>The Holder must implement the Plan during Construction and Operations.</p>
25	<p>Bear Smart</p> <p>The Holder must ensure the Project achieves “Bear Smart” status, or equivalent, designation by no later than the first anniversary of the commencement of operations. The Holder must ensure the Project maintains the “Bear Smart” status or equivalent status throughout Operations.</p>
26	<p>Mountain Goat</p> <p>The Holder must ensure ski run and lift development construction activities, including but not limited to vegetation management, snow making and grooming of runs on Brohm Ridge will not be conducted during the months of April, May or November, in order to avoid impacts on goats moving between winter and summer ranges.</p>
27	<p>Mountain Goat</p> <p>The Holder must ensure that power transmission lines associated with the Project are not located in areas of spring and winter Mountain Goat range.</p>

28	<p>Mountain Goat</p> <p>The Holder must ensure that Lift Q is constructed as an aerial lift and designed to ensure skiers are located below the north side crest of Brohm Ridge to ensure that the lift is not visible to mountain goats wintering on the south-facing slopes of Brohm Ridge and the upper reaches of the Cheekye drainage.</p>
29	<p>Culverts</p> <p>To reduce the potential for collisions and wildlife mortality, the Holder must cause all Project culverts to be bottomless arches in those areas identified in the BREMP as being critical and important wildlife habitat.</p>
30	<p>Amphibian Habitat</p> <p>The Holder must retain a minimum of 30 metre setback along fish-bearing or permanent non-fish-bearing streams in order to ensure the amphibian habitat is maintained unless otherwise authorized by FLNR on the advice of Holder's QP.</p>
31	<p>Old Growth Management</p> <p>The Holder must not develop or construct any Project-related facilities within legally designated Old Growth Management Areas (OGMAs) without having developed and obtained FLNR's approval of an Old Growth Replacement Plan that, among other things, describes how the Holder will offset potential impacts within such OGMAs by protecting or causing the protection of new areas of protected old growth forest that are managed to avoid or otherwise protected from adverse effects. When developing any such plan, the Holder must meet with FLNR to discuss, among other things, FLNR's expectations related to replacement conditions, including appropriate site series and species information. The Holder must not undertake any construction activities without the approval of FLNR.</p>
32	<p>Air Quality</p> <p>Prior to commencing construction, the Holder must develop an Air Quality Mitigation and Monitoring Plan (Air Quality Plan), in consultation with MoE and HLTH. The Air Quality Plan must, at a minimum, include the following components:</p> <ul style="list-style-type: none"> • Means by which the Project will meet the objectives of the Sea to Sky Air Quality Management Plan, including but not limited to addressing emissions from machinery, vehicles and heating systems; • Measures to monitor air emissions impacts to air, including but not limited to the establishment of air quality monitoring stations and determining which parameters to monitor; • An approach for regular reporting of the effects from air emissions, including reporting to the appropriate government agencies, Squamish Nation and the public; and • The adaptive management plan to address Project-related effects related to air quality, if those effects are not mitigated to the extent predicted in the Application or if unexpected effects occur.

	<p>The Holder must engage Squamish Nation in developing and sharing information regarding implementation of the plan.</p> <p>The Holder must provide the plan to EAO, MoE, HLTH and Squamish Nation no less than 30 days prior to the Holder's planned date to commence Construction. The Holder must implement the final plan to the satisfaction of EAO. The Plan must be implemented during Construction and Operations.</p>
33	<p>Air Quality</p> <p>The Holder must not burn wood waste or construction materials during any phase of the Project.</p>
34	<p>Liquid Waste Management</p> <p>The Holder must cause a QP to develop a Liquid Waste Management Plan (LWMP). The LWMP must be developed in consultation with the Ministry of Environment, the SLRD, Squamish Nation and the SLRD.</p> <p>The LWMP must be developed in accordance with the most recent version of the "<i>Interim Guidelines for Preparing Liquid Waste Management Plans</i>", and the <i>Environmental Management Act</i> and applicable regulations.</p> <p>The LWMP must include, but is not necessarily limited to, the following:</p> <ul style="list-style-type: none"> • an inventory of existing infrastructure in the Project footprint serviced by on-site water and sewer systems including permitted and registered discharges under the MWR; • identify the Project area that is subject to the plan including the boundaries of all watersheds within the Project area; • provide future land use and population projections to aid in the long term development of treatment for municipal waste water originating from the Project; • identify how the Project will be designed to promote water conservation within both residential and commercial sectors and prevent inflow and infiltration into the sewer system; • identify how the stormwater management system will be designed to incorporate on-site rain water management into building design; • identify a population size, that achievement of which will cause the Holder to construct a municipal waste water treatment system for the Project; • identify the municipal waste water treatment system to be used at the Project for treating municipal waste water to reclaimed water standards in accordance with the Municipal Wastewater Regulation and specify the ways in which reclaimed water will be used; • identify hazardous and toxic products used at the project that would reduce or prevent the municipal waste water treatment system from functioning as designed if they entered the municipal waste water infrastructure or treatment system; • identify mitigation measures that the Holder will implement in the design of the municipal waste water infrastructure to prevent the introduction of the hazardous and toxic products to the Project sewer system and municipal waste water

	<p>treatment system;</p> <ul style="list-style-type: none"> • identify a population size, that achievement of which will cause the Holder to either expand the municipal wastewater treatment system in use or construct additional municipal wastewater treatment system(s) for the Project; • create an environmental monitoring program to assess the impact to the receiving environment of any municipal waste water discharge from the Project that includes an assessment of the cumulative effects of the discharge on the receiving environment ,trend analysis of the discharge on the receiving environment, and monitoring of endocrine disrupting chemicals, persistent organic pollutants and other micro-contaminants; • identify how septage will be managed as biosolids in accordance with the Organic Matter Recycling Regulation; • identify how gray water recovery systems will be integrated into building design; and, • identify a protocol for establishing a plan monitoring advisory committee, including roles and responsibilities, to monitor the implementation of the actions required by the plan. <p>The LWMP must be developed to the satisfaction of the MOE and EAO. The LWMP must be submitted to MOE and EAO for review and comment 90 days before Operations commence. An annual report on the implementation of actions required by the plan must be submitted to MOE and EAO by January 31 each year for the preceding calendar year.</p>
35	<p>Solid Waste Management</p> <p>The Holder must cause a QP to prepare a Solid Waste Plan (SWP) for Operations to the satisfaction of MoE prior to commencing Operations. The SWP must identify the procedures for handling, transporting, and disposing of non-hazardous and household hazardous solid waste generated by the Project. The Holder must develop the SWMP in consultation with DOS and SLRD.</p> <p>The SWP must be implemented before Operations commence and reviewed every 5 years thereafter to determine whether the project can continue to send waste to SLRD facilities or whether the SWP needs to be reviewed to determine alternate disposal options. If it is determined that alternate disposal options are required, the holder must consult with the MOE, DOS and SLRD to determine alternate waste disposal options and the plan must be revised to include the alternate waste disposal options the project wishes to utilize. The revised plan must be submitted to MOE for review and comment 90 days prior to implementation. The plan and any revisions to the plan must be to the satisfaction of MOE.</p> <p><u>Plan Objectives</u> The SWP objectives must be to:</p> <ul style="list-style-type: none"> • comply with the SLRD solid waste management plan, including incorporating SLRD waste reduction principles (reduce, reuse, recycle); and • detail how the Project will integrate into SLRD waste diversion programs, and utilize existing waste management infrastructure.

	<p>The SWP must:</p> <ul style="list-style-type: none"> • detail recycling and composting programs and facilities; • identify plans for waste collection from waste generators (households, businesses, and others); • identify plans for handling and disposal of land clearing, construction and demolition waste; • identify plans for household hazardous waste management; • identify waste reduction targets; • define educational programs related to reducing, reusing and recycling; • develop and implement programs for commercial waste generators, in conjunction with the SLRD; • identify plans for temporarily holding recycling material and refuse prior to transport for processing or to landfills; and • detail plans to prevent and clean-up illegal dumping and littering. <p><u>Reporting</u></p> <p>The SWP must include annual reporting requirements and require that such reports regarding the implementation of the SWP including but not limited to the Holder's progress toward achieving waste reduction targets be provided to SLRD, DOS and MoE by January 31 each year for the preceding year, if development occurred during the preceding year. After the project site is fully developed a report regarding the implementation of the SWP including by not limited to the Holder's progress toward achieving waste reduction targets will be submitted once every 5 years.</p>
36	<p>Archaeology Plan</p> <p>The Holder must, prior to the commencement of Construction, retain a QP to prepare, to the satisfaction of FLNR, an Archaeology Plan that, for Construction and Operations, includes, at a minimum:</p> <p>(a) a methodology for identifying archaeological features in areas of ground disturbance and Project-related areas of public recreational use is anticipated including, but not limited to commercial and residential developments, access roads, snowmaking reservoir and geotechnical assessments, ski runs, utilities; and,</p> <p>(b) a detailed plan for inventory, assessment and impact management of archaeological features, including but not limited to monitoring of Project development areas for archaeological features.</p> <p>The Holder must implement the Archaeology Plan during Construction and Operations.</p> <p>All documentation required by the Archaeological Plan must be completed in accordance with Archaeology Branch standards.</p>
37	<p>Archaeology</p> <p>The Holder must retain the services of a Qualified Professional Archaeologist (QPA) acceptable to the Squamish Nation with demonstrated experience and knowledge of</p>

	<p>environmental monitoring for construction projects in BC. The QPA must report independently to FLRN and the Squamish Nation and have the authority to ensure that the Holder comply with all aspects of the EAC that relate to archaeology. The Holder must ensure that the QPA's terms of engagement require the QPA to conduct site inspections at a frequency and schedule that is acceptable to FLNR and Squamish Nation. The Holder must give the QPA the authority to stop work if the QPA determines the Holder has not, or may have not, complied fully with this EAC as it relates to archaeology.</p> <p>The Holder must ensure that the QPA prepares and submits reports on its compliance with the terms and conditions of this EAC and the CEMP to EAO at a timeframe specified by EAO. The Holder must ensure that the QPA provides copies of the reports to the Holder, FLNR and Squamish Nation at the same time as it provides copies to EAO.</p> <p>If the QPA determines that Holder has not, or may not have complied fully with this EAC as it relates to archaeology, the QPA must notify EAO, FLRN and the Squamish Nation within 24 hours of learning of such non-compliance. EAO may direct the Holder to retain a new QPA if this reporting timeline is not met.</p> <p>The Holder must retain the QPA prior to the commencement of Construction and continue to employ the QPA for the duration of Construction.</p>
38	<p>Squamish Nation Traditional Knowledge</p> <p>The Holder must prepare, to the satisfaction of Squamish Nation, a Traditional Ecological Knowledge Acquisition and Retention Plan (TEKARP) that, for Construction and Operations, includes:</p> <ul style="list-style-type: none"> (a) Areas of ground disturbance and areas where public recreational use is anticipated, including but not limited to commercial and residential developments, access roads, snowmaking reservoir, ski runs, utilities; and (b) Procedures for acquisition, inventory, assessment, management and monitoring of the potential impacts of Project development on areas of Squamish Nation traditional and culturally important use. <p>The TEKARP must contain the following core elements:</p> <ul style="list-style-type: none"> (a) Details on how inventory, recovery, salvage and relocation, if necessary, of culturally important plants (including culturally modified trees) potentially affected by Project development; (b) Details on how access through the resort area for current traditional use purposes will be maintained; (c) Details on the provision of opportunities opportunity to recover or salvage and relocate culturally significant plants and to protect culturally significant plant species; (d) Details on how Project design will be modified to mitigate potential impacts on plants of medicinal or cultural use and areas of traditional use; and (e) Identification of Squamish Nation terrestrial and aquatic harvesting areas, including

	<p>the identification of alternative harvesting areas should, in the opinion of Squamish Nation, mitigation or Project design is not successful in protecting the harvesting opportunities of the Squamish Nation.</p> <p>The TEKARP must contain specific information on the following areas and topics:</p> <ul style="list-style-type: none"> (a) The potential effect of ski runs and associated infrastructure on mountain goats; (b) Squamish Nation interests in deer, moose and grouse hunting on lower Brohm Ridge and adjacent areas, including ways to design the Project to restrict public access into these and other culturally important areas; and (c) Squamish Nation interests in deer, moose and grouse hunting areas located north of the Cheekye River between the Cheakamus River and Brohm Lake to Culliton Creek. <p>The TEKARP must be completed on a timeline as specified by EAO, in consultation with the Squamsh Nation.</p> <p>The TEKARP must be implemented during Construction and Operations.</p>
39	<p>Climate Monitoring</p> <p>Within three months of the date of the issuance of this EAC, the Holder must provide a Weather Data Collection Plan to Mountain Resorts Branch (MRB) which describes the placement of industry-standard weather stations at strategic locations agreed to by MRB within the Project area, including, but not limited to areas on Brohm Ridge. The Plan will enable the Holder to provide MRB with annual weather data reports and make real time data available to BC Wildfire Services (WFS) including:</p> <ul style="list-style-type: none"> • Temperature; • Precipitation; • Relative Humidity; and • Wind speed. <p>The Holder must, at a time specified by MRB, provide annual reports which must include, among other things, summary analysis for the year for snow levels at various locations, timing and duration of wind events that would preclude lift operations, number of skiable days in specific pods identified by MRB and any other unusual weather events of note.</p> <p>Real-time data must be provided to WFS to enable the evaluation of wildfire risk to human life and infrastructure, based on long-term climate trends and real-time weather information that informs fire risk ratings, based on their direct influence on forest fuel types, and would also inform wildfire response in event of an active wildfire.</p> <p>The Plan must be implemented in a timeline determined by MRB.</p>
40	<p>Employee Housing</p> <p>The Holder must provide at least 10% of the resort bed units as employee housing.</p>