Sea to Sky Multimodal Evacuation Plan

Resort Municipality of Whistler
and District of Squamish

SQUAMISH | WHISTLER

RECORD OF AMENDMENTS

Date	Amendment Description	Entered By
26/06/2019	Updated DOS flood hazard areas map on pg. 14	Megan Latimer

Contents

Introduction

Purpose of the Plan

The purpose of the Sea to Sky Multimodal Evacuation Plan ("the Evacuation Plan" or "the Plan") is to establish the principles, structures, roles and responsibilities for a coordinated evacuation of the entire community of the Resort Municipality of Whistler (RMOW) or District of Squamish (DOS). The Plan specifies arrangements, agency roles and responsibilities, and a range of considerations and actions for the evacuation of people from a hazardous community environment to a location where they will be safe. Addressing mass transportation and evacuation issues are critical components of the response to a major emergency in the Sea to Sky Corridor.

Vision of the Plan

The vision for the Plan was:

- For all agencies in the Corridor with jurisdiction, responsibility, or resources for mass evacuation to come together and collaboratively develop an evacuation process and plan to effectively evacuate an entire community;

- That the Evacuation Plan would be based on realistic scenarios, strategies, resources and timelines, so it will be effective in practice;

- That all agencies with a role in the execution of the Plan would be included in its development and have a clear understanding and a shared approach to evacuation planning;

- To enable evacuations to be executed effectively in a coordinated manner; and

- To demonstrate communities and agencies coming together for the purpose of protecting and serving the public in times of emergency.

The protection of life is the key principle and the primary objective of this evacuation planning effort.

Plan Approach

The mass evacuation of a community is multi-jurisdictional, which means that there is neither a single authority with a mandate for all components of an evacuation, nor one agency with all the necessary resources to execute a mass evacuation. Therefore, to successfully develop an Evacuation Plan for the RMOW and DOS it was necessary to bring together the agencies with a responsibility or resource for evacuation, and collaboratively develop a Plan that is supported by the respective agencies. Agencies were brought together in the form of a project Steering Committee.

Scope of the Plan

The Sea to Sky Multimodal Evacuation Plan outlines the process and resources for the complete evacuation of either the RMOW or DOS to the north or south using the existing highway system and other safe and practical modes of transportation, including rail, ferry, and air. The Plan considers all hazards, meaning the plan and process is not specific to one hazard, but can be implemented for any hazard requiring the complete evacuation of either the RMOW or DOS. The Plan can be implemented for a hazard threat or hazard incident.

A hazard threat is a hazard that may occur, but that has not yet impacted people or property (e.g. rising water levels or a wildfire outside the community). A hazard incident is a hazard that has already materialized and is impacting people or property (e.g. a dyke breach or structure or interface fire within the community). The Plan can be implemented for evacuation scenarios that provide advanced warning or those that provide no notice at all and pose an immediate threat.

Plan Format

The Plan has been formatted in three parts including a Guidance Document, a Geographic Information System (GIS) Map, and an Operational Evacuation Plan.

The Guidance Document presents the core planning principles and operational elements for a mass evacuation in response to an emergency. Because the scope of operations is so broad, the information in the Guidance Document is intended to be general with more detailed operational information provided in the other parts of the Plan. The Guidance Document is not a step-by-step guide of how an evacuation will be implemented, but rather an overview of the process and strategies that will be used to coordinate an evacuation. The Guidance Document captures and shares the information gathered and evaluated through the planning process as a historical record of background and rationale for decisions made through the process. The audiences for the Guidance Document are the key agencies involved in the evacuation of a community, Councils and staff of the RMOW and DOS, and the public.

The Operational Evacuation Plan is a detailed step-by-step document containing the specific information required to implement and coordinate an evacuation. The Operational Evacuation Plan will include flow charts, checklists, pre-scripted messaging, and resource and phone lists with specific information. The Operational Evacuation Plan will not include rationale or background information. The Operational Evacuation Plan will be used by decision makers in the Emergency Operations Centre (EOC) and by agencies with a role in implementing a portion of the Plan.

The Evacuation Plan includes a GIS Map, which includes road network features, road network constraints, transit stops, community muster points, evacuation zones, changes to be implemented to the road network in an evacuation, and guidance on the time needed to evacuate the community under different scenarios. The GIS Map will be used as a reference for spatial decision-making during mass evacuation scenarios. The GIS Map will be used by decision makers in the Emergency Operations Centre and by agencies with a role in implementing a portion of the Plan. The Guidance Document is the only portion of the Evacuation Plan that will be shared publically.

Guidance Document

Guidance Document - Explains the strategy of a mass evacuation for RMOW and DOS. Frames and guides the operational document and GIS map

Operational Evacuation Plan

Operational Evacuation Plan - Step-by-step document containing the specific information required to implement and coordinate an evacuation

GIS Map

GIS Map – Visualizes key spatial data for evacuation operations

Document Use

This document will be shared with the public for informational purposes only. The document is not to be used or reproduced without permission from the RMOW and DOS.

Project Organization

Project Leads

The DOS and RMOW provided funding and coordinated the development of the Evacuation Plan. The DOS and RMOW staff led the project Steering Committee and completed the Guidance Document and Operational Evacuation Plan. The DOS and RMOW retained ISL Engineering and Land Services Ltd. (ISL) to complete the technical aspects of the Plan.

Steering Committee

The project Steering Committee was integral in the development of the Evacuation Plan. The committee was comprised of representatives from agencies with a responsibility or resource for evacuation. The committee met regularly to review data, provide subject area expertise and resource information, discuss options and make decisions on the direction of the project.

Agencies represented on the Steering Committee included:

- District of Squamish
- Whistler Transit Ltd.
- Resort Municipality of Whistler
- RMOW Transportation Advisory Group
- Squamish Nation
- BC Ferries
- Lil'wat Nation
- Squamish Terminals
- Squamish Lillooet Regional District
- BC Wildfire Service
- Village of Pemberton
- RCMP
- Ministry of Transportation and Infrastructure
- Canadian Red Cross
- BC Transit
- Emergency Management BC

A project Steering Committee List, including names of the representative of each agency, can be found in **Appendix 1** Project Steering Committee List of Representatives on page 116.

ISL Engineering

ISL was the lead on the technical aspects of the Evacuation Plan. Specifically, ISL completed an in-depth technical review of highway transportation infrastructure to understand the capacity and constraints of Highway 99 and potential opportunities to overcome them, and to calculate evacuations recommend evacuation strategies that maximize the use of available infrastructure and minimize the amount of time for each community to evacuate. ISL used PTV VISSIM software (Version 9.00-11) and a previously developed model of Highway 99 from Pemberton to West Vancouver to estimate the time it would take for each community to evacuate under different conditions. ISL also developed the GIS Map and contributed to the Guidance Document and Operational Evacuation Plan. ISL presented options to the project Steering Committee members, who then decided on which options and strategies to develop into the Evacuation Plan.

Plan Approval

The project Steering Committee was the first to approve the Evacuation Plan in its entirety, including the Guidance Document, the Operational Plan and the GIS Map. The Guidance Document will be taken to RMOW and DOS Councils, respectively, for consideration and endorsement once complete. The GIS Map and Operational Plan are operational documents, which will be approved by the Steering Committee, but do not require Council endorsement.

Plan Updates

Much of the information used to compile the Evacuation Plan is dynamic and will change over time. The RMOW and DOS will update the information, as infrastructure, personnel, and resources change and as best practices for evacuation evolve. Any major changes to the Evacuation Plan, such as significant changes to hazard and resource information or general strategy, will be taken to Council for approval.

The project Steering Committee will reconvene annually in the spring to review and test the Plan.
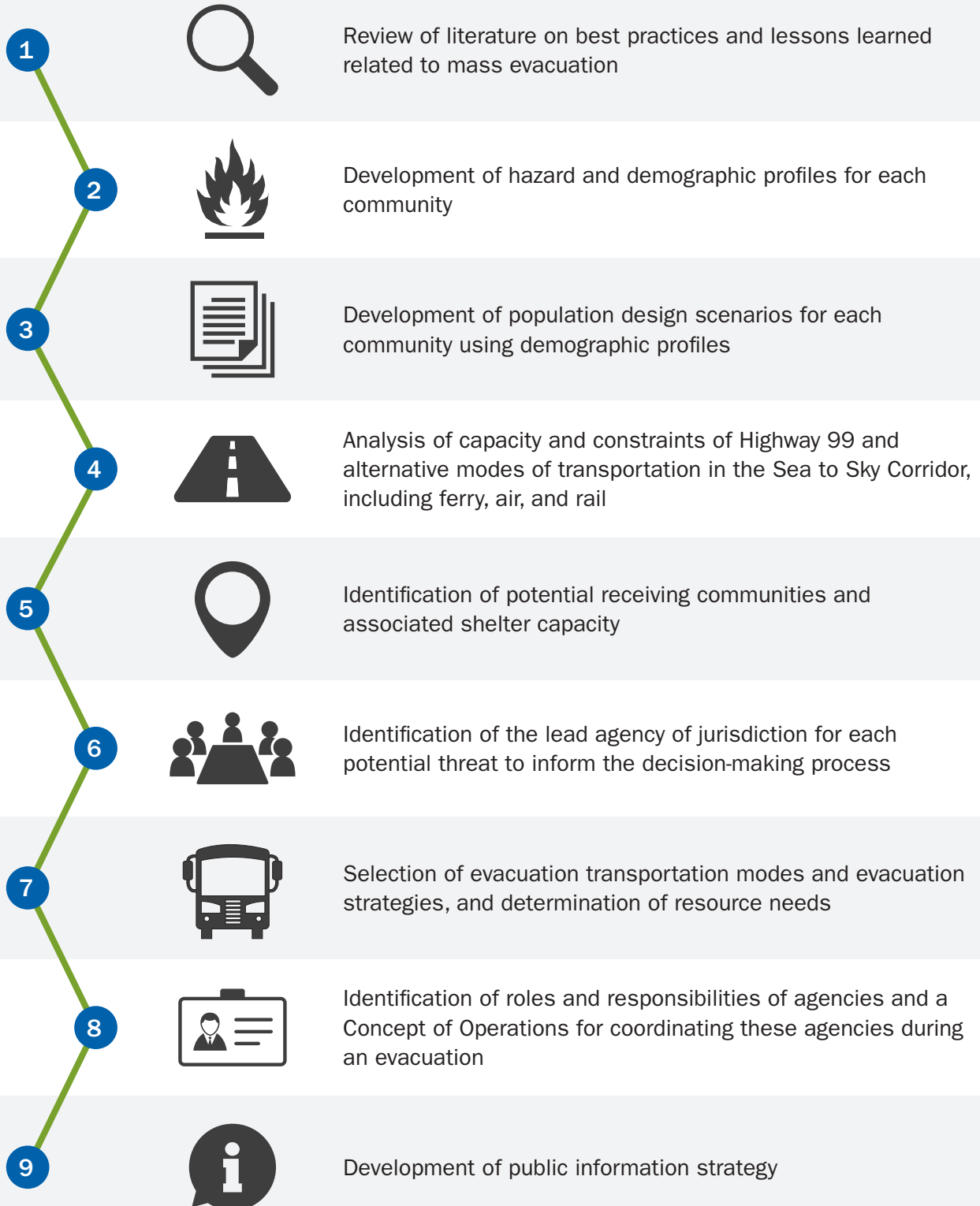
Planning Questions

A series of questions were considered during the initial planning to develop a comprehensive evacuation plan. These questions guided the planning process, and the responses to the questions are answered through the Guidance Document. Among the questions considered were the following:

- What are the hazards in the DOS and RMOW that could require a mass evacuation both with advance notice and no notice?
- Are there any hazards that could cause the mass evacuation of both communities simultaneously?
- What is the maximum number of people, who may need to evacuate from each community?
- What is the maximum number of vehicles that will need to be on the highway during an evacuation?
- What is the potential demand for transit services (i.e. what percentage of people are carless and will rely on transit during an evacuation)?
- Where will people want or need to go once evacuated?
- How many people may require assistance to evacuate?
- How many people may require shelter?
- How can we maximize the capacity of highway infrastructure by using traffic management strategies?
- What is the approximate amount of time it will take to evacuate an entire community using this plan?
- What are the multimodal transportation infrastructure options in the Sea to Sky Corridor?
- How will these options be used in an evacuation?
- What are the methods of decreasing congestion on the highway? Is phased evacuation an option? Is carpooling an option?
- Who has the legal authority to order a mass evacuation? Under what conditions?
- How is the decision to evacuate a community made? What information do decision makers need to determine if an evacuation is required?
- What is the common organizational framework for a mass evacuation? How will agencies communicate? When an evacuation is implemented, how do we ensure the information is clear and coordinated between agencies? How will we ensure a common operating picture with so many agencies involved in the implementation of the Evacuation Plan?
- How do we communicate evacuation information to the public in a timely manner? What communications channels will we use? What information does the public need to take action?

Planning Process

There were many steps in the planning process. A large part of the process was gathering data to inform the planning questions and decisions made by the project Steering Committee. Steps in the planning process included the following:

1. Review of literature on best practices and lessons learned related to mass evacuation

2. Development of hazard and demographic profiles for each community

3. Development of population design scenarios for each community using demographic profiles

4. Analysis of capacity and constraints of Highway 99 and alternative modes of transportation in the Sea to Sky Corridor, including ferry, air, and rail

5. Identification of potential receiving communities and associated shelter capacity

6. Identification of the lead agency of jurisdiction for each potential threat to inform the decision-making process

7. Selection of evacuation transportation modes and evacuation strategies, and determination of resource needs

8. Identification of roles and responsibilities of agencies and a Concept of Operations for coordinating these agencies during an evacuation

9. Development of public information strategy

Review of Hazards in the Sea to Sky Corridor

The Evacuation Plan is considered "all hazard" meaning the evacuation process and plan will be used to coordinate a mass evacuation regardless of the nature of the threat. Despite the all hazard nature of the Plan, a review of the hazards that could necessitate a mass evacuation of the RMOW or DOS was included in the planning process. This review informed the potential scale of an evacuation, the intensity of the event, the amount of time between the onset of a hazard and a need for evacuation, and specific planning considerations for each hazard. A list of potential hazards for the DOS and RMOW are included below.

Key questions that guided the hazard review for both communities included:

- What are the hazards in the DOS and RMOW that could require a mass evacuation both with advance notice and no notice?
- Are there any hazards that could cause the mass evacuation of both communities simultaneously?

Hazards with Potential to Necessitate the Mass Evacuation of the RMOW

Event type	Probability / frequency / likelihood	Onset potential (advance notice or no notice)	Considerations
🔥 NATURAL HAZARDS			
Air quality (wildfire smoke)	Not Rated in HRVA	Advance notice	
Interface fire	High	Advance notice or no notice	Hazard most likely to require a mass evacuation of the entire community
Volcanic eruption – Garibaldi Volcanic Belt	High	Advance notice	Would likely have advance notice through precursor volcanic activity
Earthquake	High	No notice	Evacuation would likely be due to damage to structures and critical infrastructure, and cause loss of essential services.
Loss of Essential Services or Critical Infrastructure	Not Rated in HRVA	Advance notice or no notice	Extended interruption to electrical power, water, or sewer or loss of community access and egress routes
☠ HUMAN-CAUSED			
Hazardous substance spill	Moderate	No notice	Could be due to industrial spill, rail or highway spill
Terrorist assaults using chemical, biological, radiological, or nuclear agents		Advance notice or no notice	

Hazards with Potential to Necessitate the Mass Evacuation of the DOS

| Event type	Probability / frequency / likelihood	Onset potential (advance notice or no notice)	Considerations
NATURAL HAZARDS			
Flood – moderate to major	Moderate-high	Advance notice (in most cases)	Flood could trigger partial or mass evacuation (due to dam failure, resultant debris flows, and access cut-off).
Debris flow	High	No notice	Cheekeye Fan and Stawamus River areas are most vulnerable. Most scenarios also show the debris flow running down the highway as the path of least resistance. This means the highway would be closed for many days, impacting transportation north of Squamish.
Dam failure	Low	No notice	Evacuation of all affected areas. BC Hydro has mapped eight inundation scenarios to help with emergency planning.
Barrier collapse	Low	No notice	Rockfall from the barrier could block the Cheakamus River, which could then cause an outburst flood. A blockage of this nature would increase the likelihood of a debris flow that could affect all of the Paradise Valley with the most intense impacts occurring near the District's northern boundary.
Fire - interface	Moderate-high	Advance notice	71% of the DOS is categorized as having a moderate, high, or extreme wildfire threat rating in the provincial Wildfire Threat Analysis (updated in 2018).
Volcanic eruption	Low	Advance notice	Would likely have advance notice through precursor volcanic activity
Earthquake	Low-Moderate	No notice	Evacuation would likely be due to damage to structures and critical infrastructure, and cause loss of essential services.
Loss of Essential Services or Critical Infrastructure	Moderate	Advance notice or no notice	Extended interruption to electrical power, water, or sewer or loss of community access and egress routes
HUMAN-CAUSED			
Hazardous materials release	Moderate-high	No notice	Response could also include shelter-in-place.
Terrorist assaults (including the use of conventional weapons, as well as chemical, biological, radiological, or nuclear agents)		Advance notice or no notice	

Hazards of Note

While the Plan will be used for any hazard requiring mass evacuation of the RMOW or DOS, there are specific hazards for each community that are of greatest concern and were at the forefront of planning process. For the RMOW, the greatest risk is wildfire, while for DOS flood-related hazards are of primary concern.

WILDFIRE HAZARD IN THE RMOW

The RMOW is a wildland urban interface—an area in which homes, infrastructure and businesses are found adjacent to the forest—and this proximity to the forest places the community at high risk of wildfire. The RMOW's limited access and egress routes from the community compound the risk and are of particular concern, if there is a wildfire threat significant enough to require the evacuation of the entire population.

As a result of climate change, Whistler is expected to experience longer wildfire seasons in the future. The RMOW's Community Energy and Climate Change Action Plan (CECAP) suggest that over the next 25 to 55 years Whistler will experience longer, hotter and drier summers. This is supported by historical fire danger rating data from the British Columbia Wildfire Service (BCWS), which illustrates an increasing trend in the number of high and extreme fire hazard days. Below are the fire danger rating trends in Pemberton, Whistler and Squamish.

Pemberton Fire Danger Rating 2001-2018

Whistler Fire Danger Rating 1995-2018
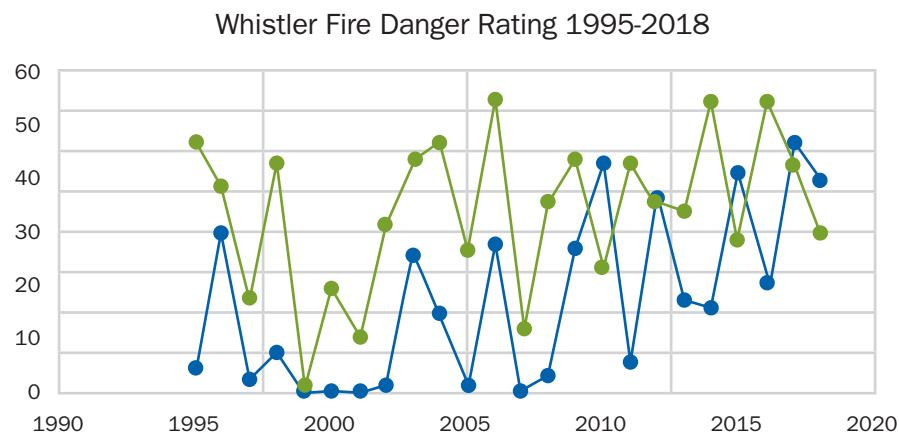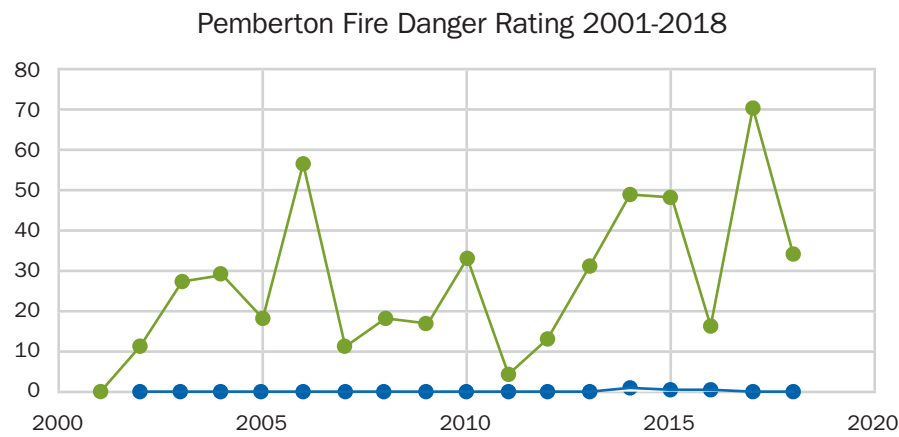
● Number of Extreme Days   ● Number of High Days

Note: The Whistler weather station location was moved in 2006 and again in 2017 to its current location in Cheakamus. There is some uncertainty in the accuracy of data from 2006 through 2016. The current Cheakamus location was installed for better accuracy.

Squamish Fire Danger Rating 1995-2018

Number of Extreme Days • Number of High Days
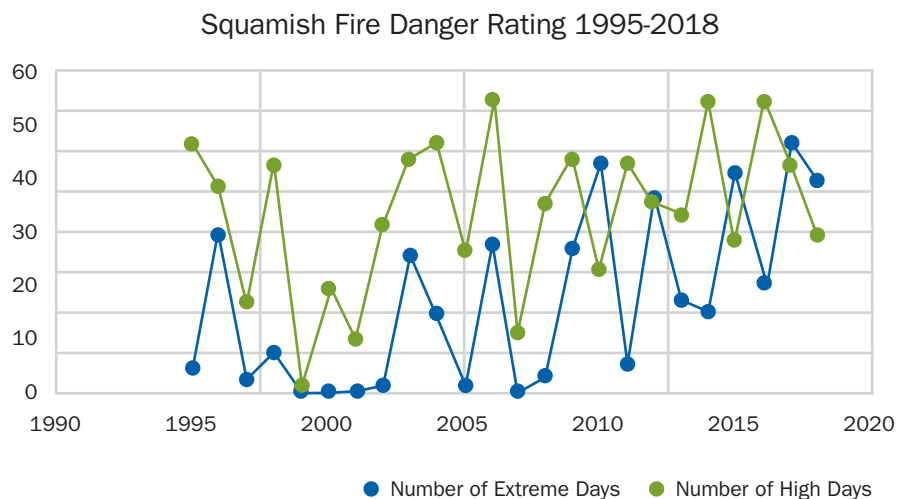
WORST-CASE SCENARIO MODELLING FOR WILDFIRE

Best practices for evacuation planning state that evacuation plans should address plausible worst-case scenarios. Fire behaviour modelling completed by B.A. Blackwell and Associates Ltd. indicates that in a worst-case scenario a wildfire in the RMOW has a potential rate of spread of 97 metres per minute or 5.82 km/h. This worst-case scenario is based on a wind speed of 40 km/h on a 45 per cent slope in a forest with C-2 fuel type. C-2 fuel-type is considered the most hazardous fuel-type in Whistler in terms of fire behaviour, rate of spread, and spotting. While a worst-case scenario is possible, it is an extremely unlikely scenario. Several rare occurrences would need to come together including sustained 40km/h winds, ignition of a C2 fuel type (which makes up only 14.5 per cent of Whistler's fuel types), and High or Extreme fire danger rating.

It's also important to note that if these conditions are present, wildfire prevention and response agencies are on standby for immediate dispatch. Despite the low probability of this situation, it was important to understand the absolute worst-case scenario for planning purposes.

Worst-case scenario modelling, in addition to recent mass evacuations in B.C, Alberta and California, have further highlighted the need for wildfire preparedness and response planning. Wildfire preparedness is a priority for the RMOW, and significant staff resources were invested in developing this Evacuation Plan.

FLOOD-RELATED HAZARDS IN THE DOS

The DOS is located at the head of Howe Sound and at the confluence of five rivers. The geography of Squamish combines four of the five most commonly flooded land types: river floodplains; basins and valleys affected by flash flooding; land below water-retention structures (dams); and low-lying coastal and inland shorelines. Flood-related hazards include floods, erosion, and dike breaches along the Squamish, Mamquam, Cheakamus and Stawamus Rivers. The Cheekeye River and several smaller creeks present flood, debris flow and avulsion hazards (the rapid blockage of a river channel with sediment and formation of a new channel), as well. Coastal flooding and tsunami hazards are also possible in Howe Sound, and are expected to worsen, as sea levels rise due to climate change.

In October 2017, the DOS Integrated Flood Hazard Management Plan was released, which includes updated floodplain mapping, as well as an overview of neighbourhoods vulnerable to flood hazard risks. Much of the community is located within flood hazard areas, including the downtown commercial area, and critical infrastructure such as the main Fire Hall, pump stations, wastewater treatment plant and primary Emergency Operations Centre. The risk of flood-related hazards is expected to become more common in the DOS, as climate change brings heavier, more intense precipitation events. This means that mass or partial evacuation within the DOS is also more likely. These factors, combined with limited evacuation egress routes and Squamish's overall exposure to the second highest number of hazards in the province, provide rationale for the resources invested by the DOS into developing this Evacuation Plan.
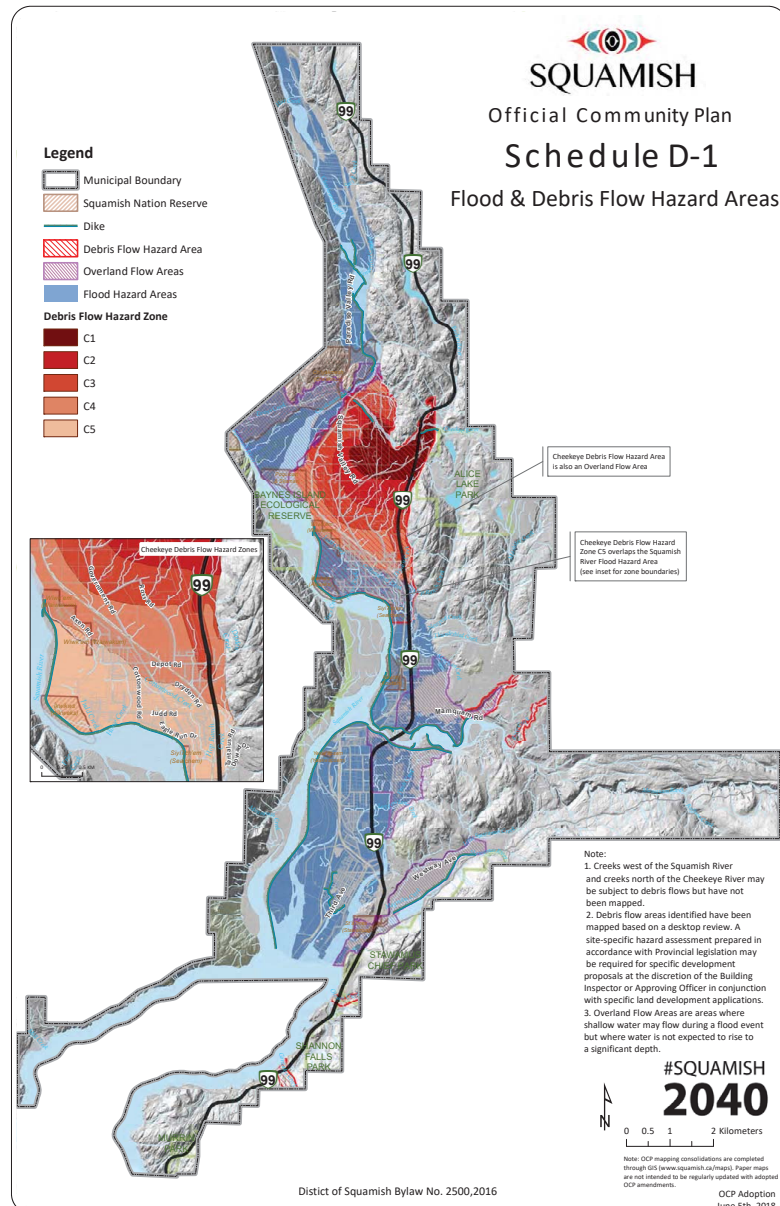
Hazards Impacting Both Communities Simultaneously

A review of hazards enabled the project Steering Committee to rule out any known hazards with the scope and scale to cause the mass evacuation of the RMOW and DOS within the same 12-hour time frame, given that the communities are almost 50 kilometres apart.

In the very unlikely scenario that both communities were threatened and needed to evacuate in the same 12-hour time frame, there would be a conversation between local governments to determine which community to evacuate first. In most cases, the community with the highest risk would evacuate first. One alternative is that the outbound community would evacuate first, and once cleared, the inbound community would evacuate. Another alternative is that the most at-risk neighbourhoods from both communities would evacuate first through a phased evacuation process. If the RMOW and DOS were unable to come to agreement, the Province of BC, acting within the authority of the Emergency Program Act, could consider providing direction under a provincial declaration on the sequence of the evacuation orders.

Community Profile and Evacuation Design Scenarios

Understanding the demographics of each community was a significant part of the planning process to ensure the Evacuation Plan would accurately represent the number of people and vehicles needing to evacuate. Information was compiled in the form of a demographic profile for each community, which was then used to establish evacuation design scenarios for modelling purposes.

Key questions that guided the design of the demographic profile for each community included:

- What is the maximum number of people, who may need to evacuate from each community?
- What is the maximum number of vehicles that will need to be on the highway during an evacuation?
- What is the potential demand for transit services (i.e. what percentage of people are carless and will rely on transit during an evacuation)?
- Where will people need to go once evacuated?
- How many people may require assistance to evacuate?
- How many people may require shelter?

To do this, the RMOW and DOS reviewed many data sources including:

- 2016 Census data
- Whistler Economic Development Model
- Interviews with municipal staff and participating agencies
- Tourism Whistler Visitor Volume Model
- Tourism Squamish annual statistics
- RMOW housing Council presentation
- Whistler Housing Authority Business and Financial Report 2017
- ICBC insurance information
- BC Housing assessment data

Population Demographics in RMOW and DOS

The RMOW and the DOS are the largest population centres within the Sea to Sky Corridor. The RMOW has a population of 11,854, and the DOS has a population of 19,512. Both municipalities fall within the Squamish-Lillooet Regional District (SLRD), which is home to 42,665 people. Tourism brings millions of people into the Sea to Sky Corridor every year.

The RMOW is a resort community, and as a result the population fluctuates depending on the season and day of the week. While the resident population is 11,854, there can be upwards of approximately 50,000 people in Whistler on a peak day. In total, Whistler sees an average of 3 million visitors per year with about 40 per cent of visitation in winter and 60 per cent in summer **(Economic Development)**. The annual estimated population equivalent in Whistler, which includes permanent residents, seasonal residents, and the average number of visitors on any given day, was 33,361 in 2016 **(Annual Estimated Population Equivalent).**

A detailed demographic profile for the RMOW can be found in the Operational Evacuation Plan. The demographic profile includes demographic information for permanent residents, seasonal residents, second homeowners, commuters and visitors. These demographic groups were evaluated separately to better understand their points of origin, potential travel patterns and possible needs in an evacuation. Some of the statistics are proprietary in nature, so the detailed demographic profile is not included in this document.

The DOS has a more consistent population base, which can be broken down into permanent residents and visitors. The total residential population of 19,512 fluctuates to some degree during weekdays, when approximately 40 per cent of the working population commutes to Vancouver or Whistler for employment. The DOS is one of the fastest growing communities in Canada with a population increase of 13.7 per cent between 2011 and 2016. On weekends Squamish has become an outdoor recreation destination for the Lower Mainland, and is a popular place for tourists to stop en route to Whistler throughout the year. Squamish Tourism data, as well as information collected from parks, tourist attractions, and accommodation providers, indicate that during peak summer weekends, Squamish can experience approximately 5,500 visitors daily within its boundaries, increasing the number of people in the DOS to over 27,000.

TELUS INSIGHTS

Using TELUS Insights—large sets of de-identified and aggregated cellphone data—to understand local population densities at different times of day and the mass movement trends of residents and visitors was explored, but not included in the planning process. This data would provide a fairly accurate snapshot of how many people are in the RMOW or DOS and where they are located in the communities, at a specific moment. While the cost of accessing this information for the planning process was prohibitive, TELUS indicated that the information could be gathered quickly, if needed in a mass evacuation. This could be useful at the onset of a mass evacuation of the RMOW or DOS, providing decision makers with an estimate of the number of people in the community, where they are located by neighbourhood and their points of origin. A reminder to staff to reach out to TELUS in an evacuation and request this data is included in the Evacuation Readiness Checklist in the Operational Evacuation Plan.

Evacuation Design Scenarios

The demographic profiles for each community were used to:

- develop evacuation design scenarios to guide the evacuation planning process;
- estimate the potential travel demand;
- estimate the transit resource and shelter requirements; and
- determine clearance times for the RMOW using model simulations.

EVACUATION DESIGN SCENARIOS RMOW

The evacuation design scenarios for the RMOW considered population and travel data for permanent residents, seasonal residents, commuters, and visitors (including day visitors and overnight visitors), second homeowners, campers and people staying with family and friends. Three different scenarios were completed, including a peak winter day, a peak summer day, and an average day based on the resort population equivalent.

Much of the raw data used to develop the evacuation design scenario is proprietary in nature, and as a result was omitted from the Guidance Document. The Operational Evacuation Plan includes an Excel template that can be used during an evacuation to estimate the number of people in the RMOW on any given day using the current occupancy rate from Tourism Whistler.

Total Estimated number of evacuees:

Average (Population equivalent): 33,361

53,480

*17,030 *Carless*

48,859

*8,442 *Carless*

*Estimated Number of (Carless) evacuees, who may need transportation.
Average (Population equivalent): 10,807

Predicted Destination:
90% South

🟡 Peak Summer Day   🔵 Peak Winter Day
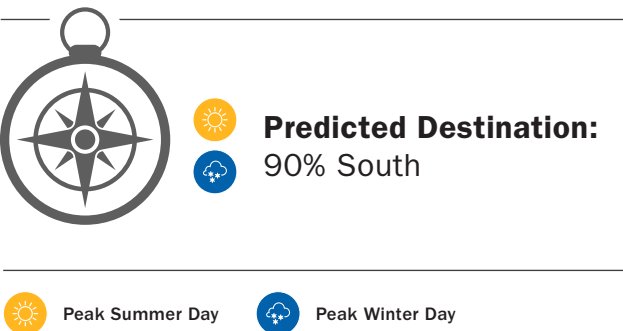
Potential number of vehicles:

Average (Population equivalent): 12,700

21,876   **21,065**
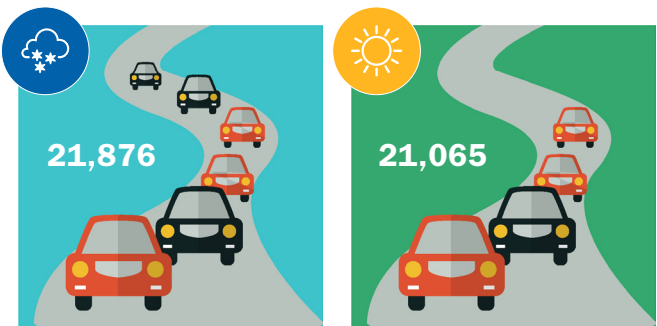
Estimated number of evacuees, who may require group lodging

Average (Population equivalent): 4,877

7,206

5,221
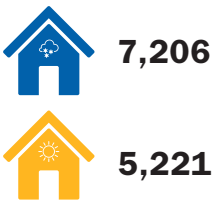
Estimated number of people, who may require evacuation assistance

Average (Population equivalent): 167

267   **244**
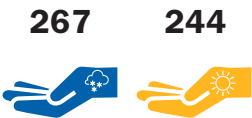
EVACUATION DESIGN SCENARIOS DOS

The evacuation design scenarios for the DOS are built using the maximum estimated population that can be expected during the year, which would be a peak summer weekend day. This includes residents, visitors (including daytime visitors and overnight visitors), and campers. Only one population assumption was chosen for the DOS evacuation design scenarios because the community is not subject to the same level of seasonal tourism-driven fluctuations as in the RMOW. Evacuation clearance times outside of peak days are not expected to be considerably different from a planning perspective due to the relative stability of Squamish's residential population base and lower tourism numbers, as well as a high vehicle ownership rate within the community. In addition, it was assumed that the majority of overnight visitors to Squamish arrive via their own transportation, which they would use to evacuate if necessary.

One phenomenon unique to the DOS which was not modeled, but is worth highlighting for evacuation transportation planning considerations, is the significant number of commuters who travel from the DOS to Metro Vancouver and Whistler (estimated to be a minimum of 34% of working age adults). If an evacuation was to occur on a weekday during working hours while commuters are outside of the DOS, there may be fewer vehicles on the highway; however, the remaining residents of single-vehicle households would require alternate transportation to be provided (via buses, carpooling, etc.) if their household's vehicle was being used by the commuter. The impact on the potential number of vehicles available for an evacuation during working hours is included below for information and evacuation transportation planning purposes; it was decided that there are too many variables to accurately model this assumption.

Total Estimated number of evacuees:

WEEKEND 27,612

*348 *Carless*

MON-FRI 23,642

*1,834 *Carless*

Estimated Number of (Carless) evacuees, who may need transportation.

Predicted Destination:
100% South

Peak Summer Weekend Day

Peak Summer Weekday (Mon– Fri, during business hours)

Potential number of vehicles:

WEEKEND 14,366

MON-FRI 10,329

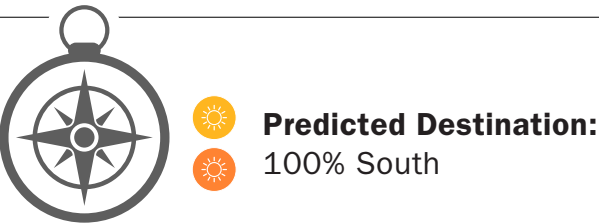**Estimated number of evacuees, who may require group lodging** 4,816

3,903

Estimated number of people, who may require evacuation assistance 390 390
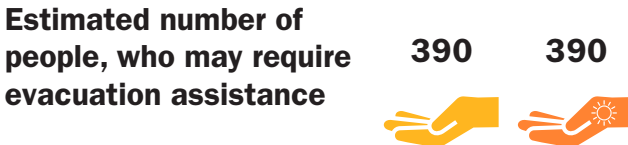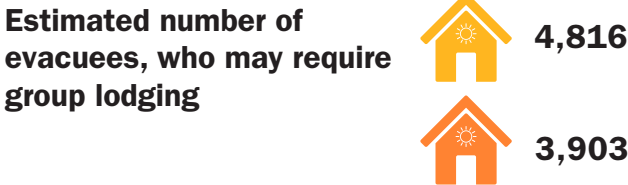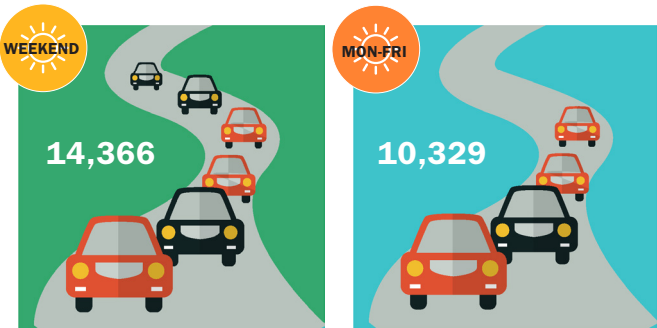
Whistler:

Design scenario	Total estimated number of evacuees	Potential number of vehicles	Estimated number of (carless) evacuees, who may need transportation	Predicted destination	Estimated number of evacuees, who may require group lodging	Estimated number of people, who may require evacuation assistance
Peak winter day	53,480	21,876	17,030	90% south	7,206	267
Peak summer day	48,859	21,065	8,442	90% south	5,221	244
Average (population equivalent)	33,361	12,700	10,807	90% south	4,877	167

Squamish:

Design scenario	Total estimated number of evacuees	Potential number of vehicles	Estimated number of (carless) evacuees, who may need transportation	Predicted destination	Estimated number of evacuees, who may require group lodging	Estimated number of people, who may require evacuation assistance
Peak summer weekend day	27,612	14,366	348	100% south	4,816	390
Peak summer weekday (Monday – Friday, during business hours)	23,642	10,329	1,834	100% south	3,903	390

Figures included for illustration only. This population assumption was not modeled.

Transportation Analysis

As part of the planning process, ISL completed a detailed transportation analysis of Highway 99 to assess roadway capacities and identify highway constraints to inform the development of effective evacuation strategies. In addition, ISL used a previously developed model of the highway using that information along with evacuation design scenarios to estimate a clearance time for each community in an evacuation. The transportation analysis is summarized below. Evacuation strategies developed using ISL's findings are available in the Evacuation Strategies section.

Key questions that guided this section include:

- How can we best manage or maximize the capacity of highway infrastructure using traffic management strategies?
- What is the approximate amount of time it will take to evacuate an entire community using this plan?

Transportation Analysis

As part of the transportation analysis, the highway was analyzed for existing conditions and constraints, including general highway lane capacity and traffic signal timing. Identifying and understanding the various highway capacities and constraints allowed ISL to estimate how many vehicles per hour would be able to evacuate out of each community, and recommend evacuation strategies to minimize congestion and maximize highway capacity during an evacuation.

HIGHWAY LANE CAPACITY

ISL estimated both lane and traffic signal capacity, as both affect the number of vehicles per hour that could evacuate via Highway 99. Vehicle headway—the time gap between each vehicle passing a common point on the highway, based on observations during reasonably congested conditions—is the primary factor used in determining highway lane capacity.

ISL estimated that a conservative lane capacity for Highway 99 is approximately 1,650 vehicles per hour. Traffic signal capacity was calculated by reviewing the variations in traffic signal timing at each intersection and measuring the throughput of vehicles for a number of cycles. Traffic signals are typically programmed to give priority to the approach with the highest demand, depending on time of day and day of week. For example, on Sunday afternoons traffic signals are often programmed to give priority to the southbound highway movement to facilitate the weekly departure of hotel guests and day visitors from Whistler. During off-peak times, the signals provide less priority to the highway and increased priority for the east-west local roads. In addition, traffic signals are equipped with vehicle detector loops in the roadway that detect vehicle demands and can restrict a signal phase, if no vehicles are detected; extend a signal phase, if high vehicle demand continues; or reduce a signal phase, if vehicle demand drops. If no traffic approaches the intersection from the minor road, the light on the priority route will stay green for much longer. For this reason, traffic signal capacity varies considerably, as indicated in the chart below. If traffic signals are programmed to give priority to the highway and there is no minor road traffic at any of the below intersections, capacity of the intersection will increase significantly, in line with the 1,650 vehicles per lane value mentioned above.

Location	Description	Southbound capacity range	Northbound capacity range
PEMB	Pemberton Portage Rd / Vine Rd	575-750	575-750
WHIS	Ski Rainbow / Crazy Canuck Dr	700	700
WHIS	Alpine Way	750-850	750-850
WHIS	Cypress Place / Nicklaus North Blvd (Ped Signal)		
WHIS	Nesters Rd / Spruce Grove Way	800-850	800-850
WHIS	Nesters Rd / Nancy Green Dr (Ped Signal)		
WHIS	Lorimer Rd	400-600	400-600
WHIS	Village Gate Blvd	1250-1450	575-675
WHIS	Blueberry Dr	1000	1000
WHIS	Lake Placid Rd (Creekside)	1000-1050	700-750
WHIS	Bayshore Dr	800-1000	575-850
WHIS	Alta Lake Road (Ped Signal)		
WHIS	Spring Creek Rd (Fire Hall Signal)		
WHIS	Alpha Lake Rd / Cheakamus Lake Rd (Function Junction)	650-1250	550-875
SQM	Depot Rd	1400-1550	1400-1550
SQM	Garibaldi Way	550-1500	550-1500
SQM	Mamquam Rd	500-1175	500-1175
SQM	Commercial Way	750-1000	1750-1950
SQM	Industrial Way / Finch Rd (DOS Emergency Operations Centre)	700-1275	700-1275
SQM	Cleveland Ave / Loggers Ln (Downtown Squamish)	1100-1550	1450-1700
SQM	Clarke Dr	1850-2100	1000-1600
SQM	Valley Drive (Casino)	1200-1975	1200-1975
SQM	Shannon Falls Park Rd	1300	1300
BRIT	Copper Dr / Main St / Mining Museum Access	900	900

In a scenario in which all highway lanes are open, all signal approaches are giving priority to the highway, traffic on the highway is steady, and there is little demand at minor roads, traffic signal timing maximizes highway capacity at about 1,650 vehicles per hour per lane.

Capacity is frequently reduced from the maximum due to constraints on the road network. These include intersection controls, such as stop controls or traffic signals; lane drops where two lanes merge into one; highway geometry that forces vehicles to reduce their speed, such as tight curves; topography that restricts any capacity improvements; or narrow bridges that restrict two-way traffic to single lane alternating traffic. There are other restrictions, such as height restrictions that will impact only some vehicles or vehicles behind them. Likewise, there are railway crossings that will dramatically impact capacity, if a train is passing through the area during an evacuation.

Evacuation Demand Modelling

Evacuation demand modelling analyzes characteristics of the evacuation road network with population numbers and characteristics to calculate the total time required (clearance time) to safely evacuate an area —in this case a community. Knowing a community's approximate clearance time under various conditions will help decision makers know how late they can leave it to initiate an evacuation order and still have a high probability of evacuating everyone. The modelling results reflect the shortest possible notice recommended based on a few selected scenarios. Decision makers are encouraged to allow more time to evacuate if possible, which will reduce the impact of any unforeseen circumstances. Evacuation demand modelling is also a valuable tool to identify transportation-related problems that may hinder an evacuation, such as the location of potential traffic bottlenecks. The modelling also provided an opportunity to test the benefits of lane reversal between Whistler and Squamish.

It is important to note that the evacuation of Whistler and Squamish via Highway 99 will take varying amounts of time, depending on the population that needs to evacuate, their access to various modes of transportation, the efficiency of the transportation system, and either the need for immediate mass evacuation or the ability to phase the evacuation. Given the significant constraints of the local highway infrastructure and the large number of people in the Sea to Sky Corridor, moving people out of Whistler or Squamish will take time.

MODELLED SCENARIOS

The evacuation design scenarios outlined in the previous section Evacuation Design Scenarios were used for evacuation demand modelling. In most of the modelling, a worst-case scenario (no-notice, peak-day mass evacuation) was used to determine how long the evacuation would take, if everyone ordered to evacuate actually did.

Seven evacuation design scenarios were modelled and assessed for evacuation from Whistler:

1. **Peak Winter Southbound Phased Mass Evacuation.** This scenario represents Whistler's peak day in winter - total vehicle volume evacuating is 21,876 vehicles. The evacuation from each neighbourhood is phased in a manner that keep traffic volumes at approximately 1,500 vehicles per hour; this avoids significant congestion along the highway.

2. **Peak Summer Southbound No-Notice Mass Evacuation.** This scenario represents Whistler's peak day in summer – total vehicle volume evacuating is 21,065 vehicles. This scenario assumes that everyone evacuates all at once and as a result all residents try to access the highway with 90% heading southbound to Squamish or the Lower Mainland, and 10% heading northbound to Pemberton or beyond. This scenario is considered a worst-case scenario.

3. **Peak Summer Southbound No-Notice Mass Evacuation with Two Lanes Southbound.** This scenario uses the same peak summer day as Scenario 2 but with an additional lane Southbound from Lorimer Road in Whistler to Depot Road in Squamish. Total vehicle volume evacuating is 21,065 vehicles.

4. **Peak Summer Northbound Phased Mass Evacuation.** This scenario uses the same peak summer day as Scenario 2, but 100% of traffic is guided north - total vehicle volume evacuating is 21,065 vehicles. Phasing was developed to keep vehicle volumes at around 1,500 vehicles per hour.

5. **Average Day Southbound Phased Mass Evacuation.** This scenario uses Whistler's population equivalent - total vehicle volume evacuating is 12,700 vehicles. Similar to scenario 1, the evacuation from each neighbourhood is phased in a manner that keep traffic volumes at approximately 1,500 vehicles per hour; this avoids significant congestion along the highway.

6. **Peak Southbound No-Notice Mass Evacuation with Traffic Control Personnel at Stop Control Intersections.** This scenario uses the same peak summer day as Scenario 2, but adds traffic control personnel at stop controlled intersections on Highway 99. Traffic control split time equally between the highway and side roads, until the side road was clear of traffic. In scenario 2, stop controlled intersections had difficulty turning onto the highway due to congested conditions. Total vehicle volume evacuating is 21,065 vehicles.

7. **Peak Southbound Individual Neighbourhood Evacuation.** This scenario models the time it will take to evacuate each neighborhood individually – with traffic control personnel stopping highway traffic. This scenario was not modelled explicitly, but rather is based on the number of vehicles within the neighbourhood and approximate turning capacities onto the highway. This scenario assumes people within the neighbourhood are packed and ready to go and leave at once. The time shown is the time to get all vehicles out of the neighbourhood. Time need to set up traffic control and for people to prepare to leave is not included.

The following three scenarios were developed and assessed for evacuation from Squamish.

1. **Peak Southbound Phased Mass Evacuation.** This assumes the entire population is evacuated in a phased manner with all traffic evacuated to the south. As above phasing was developed to keep vehicle volumes at around 1,500 vehicles per hour. Total vehicle volume evacuating is 14,366 vehicles.

2. **Peak Northbound Phased Mass Evacuation.** This assumes the entire population is evacuated in a phased manner with all traffic evacuated to the north. Phasing was developed to keep vehicle volumes at around 1,500 vehicles per hour. Total vehicle volume evacuating is 14,366 vehicles.

3. **Peak Split Direction Phased Mass Evacuation.** This assumes the entire population is evacuated in a phased manner with traffic from north of the Mamquam River evacuated to the north, and traffic originating from south of the Mamquam River to the south. Phasing was developed to keep vehicle volumes at around 1,500 vehicles per hour in each direction, which effectively lets us evacuate around 3,000 vehicles per hour. Total vehicle volume evacuating is 14,366 vehicles.

The evacuation design scenarios were assessed using a VISSIM microscopic traffic flow simulation model in which each vehicle is simulated individually. Each vehicle is represented in the simulation, and interacts with the physical limitations (e.g. curbs, lanes, curves, and merges) and other entities (i.e. maintaining headways, merging into gaps, yielding to vehicles or pedestrians with higher priority) to accurately represent traffic conditions. The output from the model includes travel time information along pre-determined routes, queue lengths at intersections, and traffic density heat maps. This type of model is particularly useful to study the build-up and dispersion of congestion and traffic queues.

MODELLING RESULTS

There were two main objectives for the modelling – to determine clearance times, or estimates of the time that would be required to evacuate each neighborhood and community under various scenarios, and to identify problem locations and neighborhoods that would take the longest to evacuate or have difficulty evacuating. The modelling also tested the potential benefit of lane reversal between Whistler and Squamish in the southbound direction only. It is important to know that the evacuation design scenarios and modelling results are only a guide; each evacuation is likely to be unique in some way and thus has the potential to create a different evacuation profile.

EVACUATION DEMAND MODELLING RESULTS FOR WHISTLER

Clearance Time for Whistler

The clearance time indicates the time from when the first evacuating vehicle enters the road network to the time when the last vehicle reaches an assumed point of safety. The results of the modelling indicate a mass evacuation of Whistler, on a peak-day with no-notice, will take approximately 15 Hours; the same scenario modelled with traffic control personnel in place at stop-controlled intersections reduces evacuation time to approximately 12.5 hours. Comparatively, a mass evacuation on a peak-day with advanced notice allowing for a phased evacuation by neighborhood, is expected to take approximately 20 hours. This additional time is required to reduce hourly volumes to a level the highway can accommodate comfortably. On an average day the phased evacuation estimate is reduced to approximately 13 hours. While the modelling illustrates that a phased evacuation will increase the evacuation clearance time overall, it also means a better controlled condition with lower highway volumes that avoid backups and reduce driver travel times out of the community. Whenever possible, a phased evacuation would be preferable. Phased evacuations are discussed in further detail in the section **Evacuation Strategies.**

Evacuation Design Scenario	Estimated Number of Hours
Peak Day Phased SB	20
Peak Day Immediate SB	15
Peak Day Phased NB	20
Avg Day Phased SB	13
Peak Day Immediate SB with TCP	12.5

Clearance Time by Neighborhood for Whistler

In addition to community clearance time, the modelling showed the estimated time to evacuate each neighborhood, under all seven evacuation design scenarios. The charts below provide the full set of neighbourhood evacuation times for Whistler. It is evident that the amount of time to evacuate each neighborhood is variable, depending on density of the population and access to the highway. This is discussed in detail in the next section.

|	Single Neighbour-hood	Peak SB Phased	Peak SB No-Notice	Peak SB No-Notice 2L	Peak NB Phased	Avg SB Phased	Peak SB No-Notice TCP
Alpha Lake Road EB	0.5	1	3.5	2	2	0.5	3.5
Cheakamus Lake Road WB	0.8	3	3.5	3.5	2	1.5	3.5
Spring Creek Drive WB	0.5	1	4.5	5	1	1	1
Alta Lake Road EB	0.5	1.5	4	4.5	2	1	1.5
Bayshore Drive WB	0.7	3.5	4	4	2	2	4
Lake Placid Road EB	0.5	2	4	4.5	3	2	5
Lake Placid Road WB	1.5	3	4	3.25	2.25	2	5
Whistler Road WB	0.9	12	14.5	8	2	2	3
Nordic Drive WB	0.9	7	14	11	2	2	4
Hillcrest Drive EB	0.5	4	11	9	2	2	3.5
Blueberry Drive EB	0.5	1	4	4	2	1	4.5
Panorama Ridge WB	0.5	2	12	9	2	1	4.5
Village Gate Boulevard WB	5.0	7	11.5	8	13	5	14
Whistler Cay Drive EB	0.6	5	12	6	2	2	8
Lorimer Road EB	0.5	1	2	1	1.5	1	5.5
Lorimer Road WB	4.6	9	14	10	3	7	17
Nesters Rd South EB	0.5	1	1.5	1	4	1	7
Nancy Green Drive WB	0.6	1	9	5.5	1	1	8
Nesters Rd North EB	0.5	1	2	1	8	1	5.5
Spruce Grove Way WB	0.5	1	4	1.5	1	1	7.5
Cypress Place	0.5	1	8	4	1	1	7.5
Nicklaus N-Boulevard WB	0.5	1	4.5	2	1	1	8
Alpine Way EB	0.8	1	7.5	4	2.5	1	10.5
Alpine Way WB	0.5	1	2.5	1	1	1	6
Meadow Lane EB	0.5	1	7	4	2.5	1	10
Crazy Canuck Drive EB	0.5	1	6.5	3.5	2	1	5
Autumn Drive EB	0.5	2	5	2	1	1	8
Emerald Drive WB	0.5	1	1	1	1	1	1
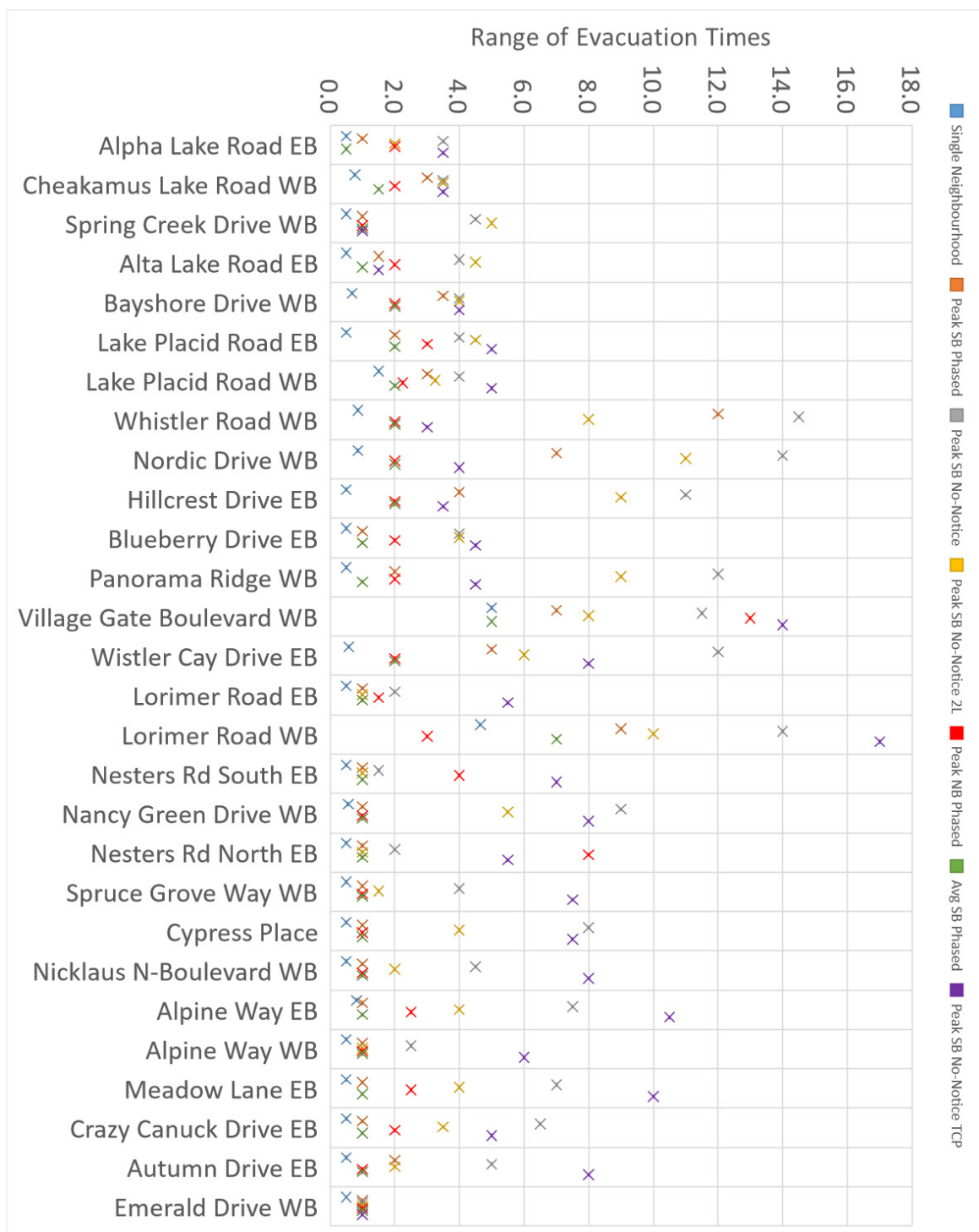
Figure: Neighbourhood Evacuation Times Whistler

Problem Areas for Whistler

The second objective of the modelling was to identify neighborhoods that would take the longest to evacuate or have difficulty evacuating. The modelling indicates that neighbourhoods that evacuate via a stop controlled intersection, which is an intersection with a stop sign and not a traffic light, will have the most difficulty evacuating. In Whistler, these include:

- Spring Creek Drive WB
- Alta Lake Road WB
- Whistler Road WB
- Nordic Drive WB
- Hillcrest Drive WB
- Panorama Ridge WB
- Whistler Cay Drive EB
- Nesters Rd South EB
- Nancy Green Drive WB
- Cypress Place
- Nicklaus N-Boulevard WB
- Meadow Lane EB
- Autumn Drive EB
- Emerald Drive WB

As an example of the length of time to evacuate a neighborhood with a stop controlled intersection – in a peak day no-notice evacuation scenario (scenario 2) – the neighborhood of Nordic (Whistler Road) could take over 14 hours to evacuate. Comparatively, Cheakamus Crossing may take less than four hours. When the same scenario is modelled with manual traffic control implemented at stop controlled intersections to split time equally between the highway and side roads (scenario 6), the time to evacuate Nordic is reduced to three hours; a significant reduction in evacuation time. This scenario does delay neighbourhoods further downstream as a result of the reduced highway capacity, but the delays are not as significant as they were for neighborhoods with stop controlled intersections. These outcomes indicate that in some evacuation scenarios, neighbourhoods with a stop controlled intersection, particularly those that must turn left to evacuate, will benefit from traffic control. This has been including in the Operational Evacuation Plan.

TWO SOUTHBOUND LANES

The evacuation demand modelling illustrated that temporarily implementing two southbound lanes on Highway 99 from Lorimer Road to Depot Road in Squamish, reduces evacuation time, and reduces the spikes in travel times as there are no merges. As an example, the results of the modelling indicate a mass evacuation of Whistler, on a peak-day with no-notice, will take approximately 15 Hours. In comparison, the mass evacuation of Whistler, on a peak-day with no-notice, with two outbound lanes reduces evacuation tome to 10 hours. When two outbound lanes are implemented, travel times are lower, as speed limits were set to 60km/hr to reflect work zone conditions, but because merge sections are removed, there is no opportunity for conditions to become congested. Ten hours does not include set-up time for the traffic management strategies required to implement two outbound lanes.

The section titled **Evacuation Strategies** provides options for two-outbound lanes, and a Transportation Management Plan is included in the Operational Evacuation Plan with specifics on how two outbound lanes will be implemented.

EVACUATION DEMAND MODELLING RESULTS FOR SQUAMISH

Clearance Time

As mentioned in the previous section, clearance times are measured from when the first evacuating vehicle enters the road network until the last vehicle evacuates and reaches an assumed point of safety. Only phased evacuations were tested for Squamish, as the nature of a flood-based evacuation (Squamish's highest risk for a mass evacuation) would likely be identified in advance through rising river levels over several days.

In a no-notice scenario, significant congestion would be expected at merge locations and traffic signals along the highway resulting in longer and less certain individual travel times. Although a no-notice evacuation is expected to be slightly shorter overall (as per the modeling done for Whistler), individual time per vehicle would be much longer, and potentially put people living closest to the hazard impact at risk by blocking their neighborhoods from being able to evacuate first. Phased evacuations are preferable in order to reduce congestion on the highway and ensure that those who are most at-risk from an approaching hazard are able to evacuate safely. Ideally, there will be people on the ground monitoring conditions to best manage the phasing.

The results of the modeling indicate that for Squamish, clearance time on a peak day with a phased northbound evacuation will take approximately 12 hours, with some congestion experienced along the route. A slightly longer phasing of the evacuation of up to 15 hours would be ideal to reduce congestion for a northbound exodus.

A phased mass evacuation to the south of Squamish would take approximately 13 hours, with some minor spikes in travel time suggesting temporary congestion at certain intersections with Highway 99. Better phasing would again help smooth out these problem areas.

A phased mass evacuation of the neighborhoods to both the north and the south (split at the bridge over the Mamquam River) is expected to take seven hours to the north and six hours to the south. The evacuation modeling for northbound traffic experienced some initial congestion which then dissipated; this can be addressed through better phasing (which would increase clearance time). The evacuation of the neighborhoods south of the Mamquam is expected to experience only minor congestion.

Evacuation Design Scenario	Estimated Number of Hours
Peak Day Phased NB	15
Peak Day Phased SB	13
Peak Day Phased Split NB/SB	7/6

Clearance Time by Neighborhood for Squamish

The clearance time by individual neighborhood in each of the three scenarios modeled for Squamish is shown in the chart below. Evacuation time by neighborhood is variable, and depends on the population density of each neighborhood, highway access constraints at intersections, and the impact of other neighborhoods evacuating onto the highway.

|	Peak SB Phased	Peak NB Phased	Peak Split at River Phased
Copper Drive WB	0	0	0
Darrell Bay Road EB	0	0	0
Shannon Falls Road WB	0	0	0
S2S Gondola WB	0	0	0
Stawamus Chief Parking WB	0	0	0
Mamquam River Service Rd EB	0	0	0
Mamquam River Service Rd WB	0	0	0
Valley Drive EB	0	2	1
Valley Drive WB	3	1	3
Clarke Drive WB	5	2	5
Mill Road EB	0	0	0
Scott Crescent WB	0	0	0
Cleveland Avenue EB	2	5	3
Loggers Lane South WB	3	1	1
Industrial Way EB	0	5	0
Finch Drive WB	3	0	1
Commercial Way EB	0	3	1
Centennial Way	0	0	0
Loggers Lane North WB	0	0	0
Mamquam Road EB	0	2	2
Mamquam Road WB	9	3	2
Garibaldi Way EB	0	2	2
Garibaldi Way WB	6	2	2
Depot Road EB	0	5	5
Depot Road WB	2	1	1
Squamish Valley Road EB	0	1	1
Alice Lake Road WB	1	0	0
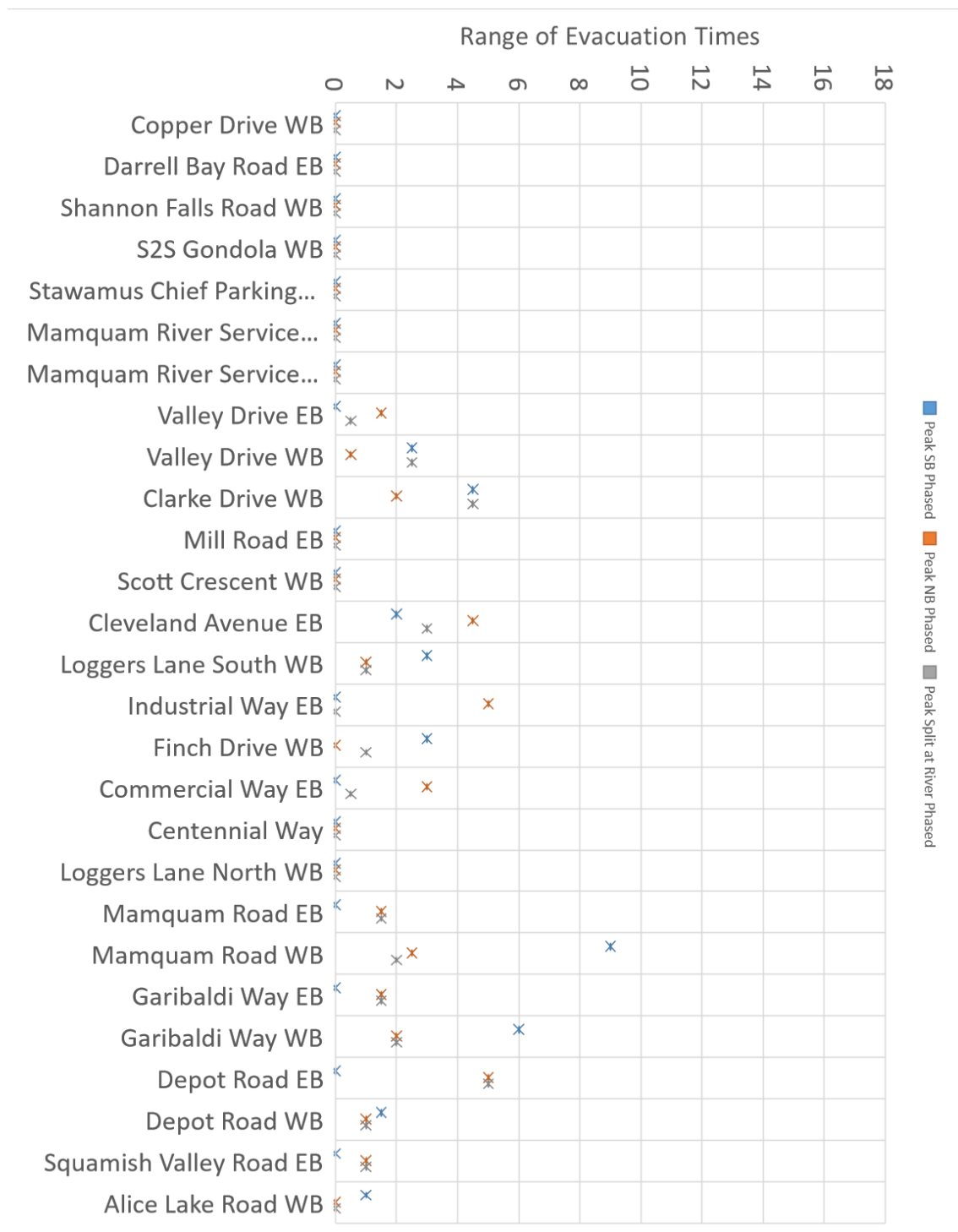
Figure: Neighbourhood Evacuation Times Squamish

Problem Areas for Squamish

The modelling identified a number of problem locations in Squamish where evacuation would take longer or pose difficulties. Stop controls are less of an issue in Squamish than they are in Whistler, as most intersections along the highway are signal controlled; problems arise in Squamish in neighborhoods with higher populations and limited egress routes onto the highway.

The neighborhoods in Squamish with the longest evacuation times (for complete clearance of the neighborhood) are displayed in the chart below.

Neighborhood	Estimated Number of Hours
Mamquam Road	9
Garibaldi Way	6
Depot Road	5
Industrial Way	5
Cleveland Avenue	4.5
Clark Drive	4.5

The section titled **Evacuation Strategies** provides options for resolving some of these issues and decreasing the neighborhood clearance times.

TWO NORTHBOUND LANES

Evacuation demand modeling for implementing two northbound lanes is planned for later in 2019. In theory, having two northbound lanes would have an initial positive effect for northbound vehicles (similar to what the modelling for two southbound lanes has indicated); however once they reach Whistler Village (and the highway is reduced back to one lane), significant congestion may be experienced which would back up along the highway. Options for reducing this congestion may be explored if the modeling results indicate a significant reduction in evacuation time by implementing the two lanes, and a Transportation Management Plan would be developed and included in the Operational Evacuation Plan to outline how two outbound lanes will be implemented.

Transportation Infrastructure: Opportunities and Limitations for Mass Evacuation

As mentioned in the previous section, all viable transportation modes were analyzed to maximize evacuation options along the Corridor, including road, marine, air and rail. The process for activating each option was documented, including the jurisdictional authority and main contact person; this information is housed in the Operational Evacuation Plan.

The pros and cons of each option were researched to provide a better understanding of their feasibility, as well as their temporal impact on organizing and implementing the evacuation process. These options can generally be categorized as primary transportation means (e.g. Highway 99) and secondary or complementary means (marine, rail, and air). Combinations of some modalities, such as road and marine, could potentially improve the efficiency of the evacuation process or offer solutions for evacuees without access to their own transportation.

The detailed analysis for each transportation infrastructure option can be found in the following sections. The specific evacuation scenario at the time of the emergency will dictate which transportation infrastructure is used, and in what capacity, to ensure the Plan is flexible enough to be effective.

Key questions that guided this section include:

- What are the multimodal transportation infrastructure options in the Sea to Sky Corridor?
- How will these options be used in an evacuation?

Road

Road transportation will be the most likely evacuation option for communities within the Corridor with the principal route being the Sea to Sky Highway (Highway 99). Alternative road modalities, including Forest Service Roads (FSRs) and trails, were also examined as options for evacuation.

HIGHWAY 99/SEA TO SKY HIGHWAY

The evacuation plan encompasses the 230-km Sea to Sky Corridor, which extends along Highway 99 from West Vancouver, through Squamish, Whistler, and Pemberton to Lillooet. Highway 99 was significantly upgraded prior to the 2010 Winter Olympics to improve capacity, passing opportunities and safety between West Vancouver and Whistler.

The highway is the only continuous road-based transportation corridor in the evacuation plan study area. In Whistler and Squamish there are some alternate routes bypass sections of the highway, such as Alta Lake Road in Whistler and Government Road and Loggers Lane in Squamish, but they ultimately rejoin Highway 99.

Options for Evacuation on Highway 99

Highway 99 will be the main evacuation route for the evacuation of DOS or RMOW both to the north and south. There are several proposed evacuation strategies to maximize capacity of Highway 99 in an evacuation scenario and these are discussed in detail in the **Evacuation Strategies** section.

TRAILS

Whistler Valley Trail

The Whistler Valley Trail is a three-metre wide multi-use paved trail network that connects all of Whistler's neighbourhoods, lakes, and parks from Function Junction in the south to Emerald in the north on both sides of Highway 99 with the exception of the north side of the highway on the north end of town. The Valley Trail is used by cyclists, pedestrians and skateboazrders. Under normal conditions, motorized vehicle use is prohibited on the Valley Trail.

In emergency situations or for maintenance, emergency vehicles can drive the entire length of the Valley Trail with the exception of the Nordic overpass pedestrian bridge, which traverses Highway 99 south of Whistler Village. The Valley Trail is considered an alternate route for emergency access and egress. Some sections are challenging to drive in a vehicle due to sharp corners and steep banks. Winter vehicle access is also limited due to narrowing width caused by snow banks, and some sections of the Valley Trail are not plowed. All Valley Trail bridges permit loads of up to 63,000 kg. There are gates along the trail, which are left down in the winter to allow for snow plowing of some sections. In the summer these gates would have to be opened to be used as access, egress or alternate evacuation routes.

Squamish Corridor Trail

The Corridor Trail is a three-metre wide (in most sections) paved cycling commuter trail that, when complete, will stretch from the Stawamus Chief Apron to Depot Road in Brackendale. It is used by cyclists, pedestrians, and runners as an environmentally-friendly option to get safely from one end of town to the other, and also connects neighbourhoods and important recreation sites, such as Brennan Park Recreation Centre, Smoke Bluffs Park and Stawamus Chief Provincial Park.

In an emergency situation, some sections of the trail could be driven by emergency vehicles. However, there are a number of constraints along the trail (e.g. narrowing at bridges over the Mamquam River and the Mamquam Blind Channel) that would make parts of it impassable for vehicles.

Options for Trail Use in an Evacuation

In a mass evacuation, the Whistler Valley Trail and Squamish Connector Trail would be used by pedestrians and cyclists to travel to bus stops or central muster points or to meet friends or family. The trails could also allow someone to quickly escape an immediate threat. If primary access and egress routes are closed, the Whistler Valley Trail may be used as an alternate evacuation route; limited parts of the Squamish Corridor Trail may be appropriate for emergency vehicle access.

FOREST SERVICE ROADS

There is a large network of Forest Service Roads (FSRs) in the Sea to Sky Corridor. FSRs are roads found on Crown land and are not part of the provincial highway system managed by the Ministry of Transportation and Infrastructure (MOTI). FSRs are typically one or two-lane gravel roads used by industrial vehicles engaged in resource operations (e.g. forestry, mining or gas) or by the general public and commercial recreation operators (ex. rafting companies or fishing lodges).

FSRs are administered by the Ministry of Forest Lands and Natural Resource Operations and Rural Development (FLNRORD) and are maintained either by the forest industry under road use permits, or where there is no industrial user responsible for maintenance, by FLNRORD. Where there is no industrial maintainer, FLNRORD carries out maintenance, which is subject to available funding. Communities, rural residents and high value recreation sites have priority. FSRs are not built or maintained to the same standards as public highways; most have gravel surfaces and are narrow (often one-lane wide). There may be roadside brush limiting visibility, soft shoulders, tight curves and road grades that are much steeper than on public highways. FSRs do not necessarily have signs or barriers identifying hazards or dangers. Common hazards on FSRs include large industrial vehicles; poor visibility due to brush, alignment, dust, fog or smoke; passing or being passed on narrow roads; changing road surface conditions; freezing rain or snow; others failing to follow traffic control procedures; wildlife; gravel; rocks; deep ruts; cliffs; and lack of turnaround areas.

FSRs as Through Roads

While the FSR network in the Sea to Sky Corridor is vast, there are limited FSRs that are through-roads between communities and therefore limited opportunities for use in an evacuation, which are identified below. There are four routes that could be used as last-resort evacuation routes or bypass routes, although FSRs are a poor option for people without backcountry driving experience or off-road vehicles.

Hurley River Road – Pemberton to Gold Bridge

The Hurley River FSR connects Pemberton with the community of Gold Bridge in the Bridge River Valley. At Gold Bridge people can connect with Route 40, which is a paved provincial Highway. The Hurley is suitable for vehicles in summer (preferably 4x4) and is not maintained in winter (November to May). There is a cardlock fuel station in Gold Bridge that accepts credit cards for gas and diesel. This area is very remote and there is no cell service after Pemberton.

In-SHUCK-ch Forest Road 4x4 – Pemberton to Harrison Lake

The In-SHUCK-ch FSR runs by the Lillooet River from Mount Currie to the north side of Harrison Lake. The road provides access to several communities including Lillooet Lake Estates, Samahquam Nation, Skatin Nations and Douglas First Nation. The In-SHUCK-ch FSR connects with the Sts'Ailes FSR and then the Chehalis FSR onto Highway 7 East of Mission. The road is recommended for 4x4 vehicles and the last 40 km from Port Douglas to Harrison Hot Springs is very rough. Note: As of November 24, 2017, the Sts'ailes FSR was closed at 56 km, and has not yet (as of January 8, 2019) reopened to vehicle traffic.

Stawamus/Indian River

The Stawamus-Indian FSR is accessed by the Stawamus Chief in Squamish and runs to the top of Indian Arm. Once at Indian Arm, people would need to be moved by boat.

FSR as Neighbourhood Evacuation Routes

There are FSRs in the RMOW and DOS that provide an alternate evacuation route to neighbourhoods.

In Whistler these include:

- Cheakamus/Black Tusk FSR (Forest File 3077 Road Section 03)—Alternate emergency evacuation route for Cheakamus Crossing neighbourhood via Mount Fee Rd/Cloudburst Drive
- Janes Lake Road (Forest File 3077 Road Sections 04, 10)—Alternate emergency evacuation route for Cheakamus Crossing neighbourhood via top of Legacy Way
- CBC Tower West (Forest File 3077 Road Sections 02, 05) —Alternate emergency evacuation route for Kadenwood neighbourhood via top of Trails End Lane

Note: These FSRs may be used as alternate evacuation routes, if municipal roads and the Whistler Valley Trail are not useable. This section was written in winter, and routes will be confirmed once the snow melts.

In Squamish, FSRs that have the potential to be used as alternate evacuation routes include:

- Mamquam FSR (Forest File 9283 Road Section 01) – Alternate emergency evacuation route for Valleycliffe neighborhood to Highway 99 via Westway Ave/Cherry Drive (gate would need to be opened at Cherry Drive to enable access)

Options for Evacuation on Forest Service Roads

FSRs should be considered a very last resort as evacuation routes, as they are not considered a viable option for the general public. One motor vehicle accident or stuck vehicle on an FSR would halt traffic flow completely and create backups. The slow movement of traffic could also put evacuees in more danger in the case of a fast-moving hazard, like wildfire.

Instead of using the through-road FSRs (specifically, In-SHUCK-ch and Stawamus-Indian FSRs) as evacuation routes, officials should consider requesting FLNRORD to close these FSRs, depending on the evacuation scenario, to prevent public access during an evacuation. The exception to this is the Hurley River Road, which is in better condition than the other mentioned FSRs and is an access route to many recreational properties owned by RMOW and DOS residents. These residents may want to access their recreational properties, if their primary residence is under evacuation order. Closing the majority of FSRs will help prevent the public and emergency responders from being in a position where stranded vehicles on FSRs would require additional rescue efforts, which may not be available. With FLNRORD's assistance FSRs may be useful for bringing in resources in an emergency. The local authority should contact the Sea to Sky District FLNRORD District Manager to use or close FSRs during an evacuation. Refer to the Operational Evacuation Plan for contact information.

Note: If FSRs are closed during an emergency evacuation, local and emergency access would be maintained. For example, the residents of Lillooet Lake Estates, Samahquam First Nation, Skatin Nations and Douglas First Nation would need access to their communities serviced by the In-SHUCK-ch FSR.

Marine

Marine transportation is a viable form of evacuation transportation, particularly from the DOS. While marine transportation is unlikely to be the main mode of evacuation transportation, it may be used in addition to highway evacuation or as an alternative, if there is a highway closure. Both ferry and private marine transportation are discussed in this section, including their options for use in an evacuation scenario.

FERRY

BC Ferries does not offer direct service to the evacuation zone. The closest terminal offering regular ferry service is Horseshoe Bay in West Vancouver, which offers daily service to Vancouver Island, Bowen Island and the Sunshine Coast. MOTI maintains two emergency ferry docks south of Squamish (at Porteau Cove and Darrell Bay), which are tested annually. MOTI's emergency ferry service plan includes operational details to provide ferry service between Horseshoe Bay and Darrell Bay or Porteau Cove south of Squamish in the event of a prolonged highway closure between Horseshoe Bay and Darrell Bay. The plan uses one or more BC Ferries vessels to provide access or egress for emergency responders; allow for the supply of basic goods and essential services (food, fuel, medical supplies, etc.); and allow individuals isolated as a result of the closure to travel to their places of residence or business. While the emergency ferry service plan was not developed with evacuation in mind, many of the plan's operational components will work for evacuation.

A request to use BC Ferries in an emergency response should go through Emergency Management B.C. (EMBC). MOTI and BC Ferries would determine ferry routes, schedules and capacity.

Options for Evacuation Using Ferry

The MOTI Emergency Ferry Plan is easy to implement on short notice, and the passenger capacity of the ships is limited only by the number of life jackets. The use of the ferry is considered to work best for foot passengers being dropped off by bus only, as cars would likely back up onto the highway and slow the flow of traffic.

Darrell Bay is the preferred option, as it is closer to both Squamish and Whistler and has a traffic signal at the intersection with Highway 99, which would allow buses to drop off passengers and return to the highway. There is a parking lot at the entrance to Darrell Bay Road (at Klahanie Campground) with space for approximately 20 buses to park and capacity for additional parking within the campground, which could be used for passenger drop-off. The parking lot is a five-minute walk to the ferry dock. There are also washroom facilities available here. Alternatively, Shannon Falls parking lot on the east side of Highway 99 could be used, and has parking space for approximately 30 buses. However, passengers would have to cross the highway to reach the ferry dock (a 10-minute walk), which could disrupt traffic flows on Highway 99 and put pedestrians at risk.

Porteau Cove has parking space for approximately 20 buses in its main parking lot. The Porteau Cove Provincial Park campground adjacent to the dock site could also be used for dropping off walk-on passengers and has washroom facilities. Return access onto the highway is more complicated, as there is no traffic light to allow buses to turn north. Manual traffic control would likely be necessary to stop Highway 99 vehicle traffic and allow buses to cross the highway.

Woodfibre LNG has plans to build a second private ferry dock at the Darrell Bay site to transport workers back and forth from Squamish to the woodfibre site. Workers would be bussed to the ferry dock at Darrell Bay. This may provide further opportunities to access both ferry services in an emergency, as well as extra bus resources for emergency public transportation.

SQUAMISH TERMINALS

Squamish Terminals is a deep-water, break-bulk terminal located at the north end of Howe Sound. It can accommodate large vessels, up to the size of a Panamax and Handymax. The docks can hold smaller vessels, but the walkway would have to be modified to accommodate them.

Squamish Terminals does not own any private vessels, however, private vessels could potentially use the smaller dock. Potential users would be Squamish residents with Royal Canadian Marine Search and Rescue, Canadian Coast Guard, private boats, tug boat operators, water taxis and local marine businesses with boats.

It could be possible to bring in a large ship and moor it at one of the two berths. Moorage could be organized within a day, if the berths were not already occupied.

There is some potential to load people onto a transport vessel already docked there during an emergency, but the kind of transport vessels that use Squamish Terminals are not made to accommodate large numbers of people, and typically only carry enough personal flotation devices (PFDs) required for the crew.

Bringing in a passenger-equipped vessel, such as a cruise ship, could be a possible option for transporting walk-on passengers. During the 2010 Winter Games, a 200-m by 27-m cruise ship (with gross registered tonnage of 28,891) was brought in to Squamish Terminals to provide housing for the Vancouver Olympic Organizing Committee employees, so this option has been tested. A request to source and utilize a cruise ship should go through EMBC.

BC Ferries has never tested docking at Squamish Terminals and it is unlikely that BC Ferries would risk docking in Squamish, as there is a concern about the dock type being able to accommodate a ferry and there are other issues (e.g. not having loading system for foot passengers). Squamish Terminals can technically accommodate a ferry, but does not have a roll-on roll-off gangway, so there is no way to get vehicles onto a vessel; however, Squamish Terminals could board foot passengers from the dock to any vessel via a 12-metre portable gangway.

Options for Evacuation Using Squamish Terminals

This location would likely be used for supply vessels bringing in personnel and resources. It may be better, therefore, to reserve this location as a hub for managing response logistics, as opposed to using it for evacuating passengers, which could be done at Darrell Bay or Porteau Cover with BC Ferries. This would keep two separate flows of goods and people open. In a last-resort scenario walk-on foot passengers could board a cargo vessel, taking into account that there would not be enough life jackets for everyone.

Air

There are three airports, which serve the Sea to Sky Corridor, located in Squamish, Pemberton and Lillooet. In addition to this, there is a heliport located in Whistler and additional helicopter landing sites (HLS) in Squamish, Pemberton and Lillooet. Floatplanes can also land at the Squamish Harbour and Whistler Seaplane Base on Green Lake.

AIRPORTS

Pemberton Airport (CPYS)

The Pemberton Regional Airport (CPYS) is a registered airport located five nautical miles (9.3 km; 5.8 mi) south-southeast of Pemberton. CPYS is managed by the Village of Pemberton (VOP). The VOP facilitates communication to the Airport Users Group. There is an automatic weather station, but there are no lights, towers or navigational assistance. There is one 1,200-m runway that runs east to west.

Aircraft wanting to use CPYS must be able to land on 1,200 m. The determination to land is made by the pilot and depends on passenger and fuel loads. Currently, the VOP has been advised by consultants that a Beechcraft 1,900 (18 seats), Bombardier D-800 (37 seats) and Bombardier D-800 Q-400 (76 seats) could all land at CYPS, but the ultimate decision rests with the pilot.

Depending on the size of aircraft and weather conditions, CPYS can handle quite a bit of air traffic. Once an aircraft lands, the aircraft must turn around at the end of the runway and taxi back to mid-field, before they can exit the runway. Additional aircraft cannot land or takeoff, while the runway is occupied. The runway is not wide enough to accommodate two aircraft passing each other on the way in or out.

The runway is not always plowed in winter. In the winter of 2017/2018 the VOP filed a Notice to Airmen (NOTAM), as there were not resources available to keep the runway consistently clear. It takes about six to eight hours to completely plow and clear the runway of snow. If there is a lot of snow, it could take longer. Depending on the size of the aircraft, the entire runway may not need to be cleared, resulting in a shorter clearing time. In the event of an emergency the VOP may be able to bring in more equipment to clear the runway or contract a local company to assist. The airport runway has flooded in the past, and in 2003 the airport was under water, except for portions of the runway and the tarmac in front of Pemberton Helicopters. Access to CYPS was cut off. Also, if there were a significant avalanche or landslide on Mount Currie, the runway might be impacted.

There is Jet A fuel and 100LL available from Blackcomb Aviation with two hours' notice.

BC Wildfire Service (BCWS) uses CPYS for firefighting operations. In the past, the Province has restricted the airspace over CPYS for emergency operations only. BCWS has used the east taxiway for equipment storage, refuelling operations and tie down.

There are two private businesses that use CPYS for their operations. BCWS, VOP, private operators and the Airport User Group would need to be consulted for any emergency use of CPYS.

Lillooet Airport

Lillooet Airport is located 1.5 nautical miles (2.8 km; 1.7 mi) east southeast of Lillooet. The District of Lillooet owns and operates it, and it is located at 325 Jones Road (exit from Highway 12 onto Airport Road) on the east side of the Fraser River. The runway is 1,200 m long and 21 m wide with a clearing of 15 m, and will land an 18,000-kg plane.

The services provided by the Lillooet Municipal Airport are fuel sales, tie downs, a pilot lounge and two trailer pad rentals. Fuel sales are via an automated Card Lock System. This system accepts VISA, MasterCard, Discover Card and Lillooet Municipal Airport credit cards.

The District of Lillooet is currently reviewing the possibility of extending the runway to 1,500 m and adding lighting.

Squamish Airport (CYSE)

The Squamish Municipal Airport (IATA: YSE; ICAO: CYSE) is a registered airport located 5.4 nautical miles (10 km; 6.2 mi) north of Squamish, British Columbia. The Squamish Municipal Airport is a general aviation airport with one 732-m runway. It is used for charter services, private aircraft, flying clubs and rotary wing commercial activities. At present there is no regularly scheduled air service at the Squamish Airport. The Squamish Airport is managed by the DOS through an aviation consultant (Avcon Consulting Ltd.). There are no lights, towers or navigational assistance. Aircraft wanting to land at Squamish Airport must complete a NOTAM, consisting of a telephone call to NavCanada Centre in Kamloops. It takes approximately 10 minutes to obtain clearance to land.

The Squamish Municipal Airport's location coordinates are 49°46'54" N and 123°09'43" W. The elevation is 52 m Above Sea Level (ASL). The Squamish Municipal Airport is an uncontrolled aerodrome. The airport is equipped with one asphalt runway that is 23 m wide with a magnetic heading of 140-320 degrees. There is one taxiway and one apron. The width only allows for one aircraft to occupy the runway at a time; two aircraft cannot pass each other on the runway. It is estimated that 30 aircraft could land at the Squamish Municipal Airport in the span of one hour. Some of the largest aircraft that can be accommodated include the Cessna Caravan, Twin Otter, DC-3, Buffalo, and Pilatus PC-12. There is a 10,000L AvGas storage tank co-located with a dispenser and pump.

Snow removal in winter is coordinated by the DOS. In an emergency situation, Miller Capilano Maintenance Corporation has been used to assist in clearing snow from access routes and the runway.

The Squamish Municipal Airport is located near the Cheekeye Fan debris flow zone, and the runway and access roads to and from the airport may be at risk in the event of a debris flow. This should be partially mitigated in 2019 with the construction of a debris flow barrier as part of the Cheekeye One development, which would likely cause debris to flow only across the southeastern end of the runway.

There are numerous private commercial flying operators, who use the Squamish Airport.

Options for Evacuation Using Airports

In a mass evacuation, it is most likely that airports and air resources would be used to complete reconnaissance flights and transport resources and freight, including emergency personnel and supplies. Use of local airports is a viable option for evacuating specific groups, such as vulnerable populations or serious medical cases, but is not a realistic option for evacuating large numbers of people. In an evacuation scenario where an entire community was cut off from highway infrastructure, airports may be used to evacuate people. In the event of an emergency event requiring use of local airports, EMBC would appoint an air coordinator to coordinate and oversee operations at the local airports.

HELIPORTS

Whistler Municipal Heliport

Located in the Sea to Sky Corridor north of Whistler Village, the Whistler Municipal Heliport (CBE9) is a public facility operated by the Whistler Heliport Society (WHS). Whistler Heliport can experience busy helicopter activity year-round with tourist flights, firefighting, film, charter, heli-skiing and itinerant traffic.

The Whistler Municipal Heliport has significant capacity and would be the main hub for helicopter operations for an emergency in Whistler.

Additional Heliports

There are heliport facilities located at both Squamish and Pemberton airports. See details on the airports above for more information. In addition, Blackcomb Helicopters operates a heliport in Lillooet located at 650 Industrial Place off Duffy Lake Road.

Squamish, Whistler, and Pemberton have a number of designated helicopter landing sites (HLS), which are used by BC Air Ambulance helicopters, commercial operators and Search and Rescue teams. For a complete list of HLS refer to the Operational Evacuation Plan.

Options for Evacuation Using Heliports

In a mass evacuation scenario, heliports will likely be used to complete reconnaissance flights, transport resources and freight, including emergency personnel and supplies. In an evacuation scenario where a neighbourhood was isolated from other transportation infrastructure, helicopters may be used to evacuate people.

In the RMOW, the municipal heliport will be the main staging area for helicopter operations. Blackcomb Helicopters has agreed to help coordinate operations at the heliport and provide local area briefings to pilots unfamiliar with the area. If their capacity were overwhelmed, EMBC would appoint an air coordinator to coordinate and oversee heliport operations.

In the DOS, the municipal airport will be the primary staging area for air assets, including fixed wing and helicopter. The helipad at Squamish Terminals should be prioritized for use by BC Emergency Health Services/Vancouver Coastal Health for air ambulance landings in Squamish to evacuate patients, as it can be accessed by helicopters 24 hours a day due to adequate night lighting.

FLOAT PLANE FACILITIES

Whistler/Green Lake Water Aerodrome (YWS)

The Whistler/Green Lake Water Aerodrome (YWS) is located on Green Lake three kilometres north of Whistler. Whistler Air offers glacier tours, twice daily scheduled service between downtown Vancouver and Victoria, and custom charter services with float equipped DHC-3 Turbine Otter and DHC-2 Beaver aircraft.

Squamish Harbour

There are no regularly scheduled float plane services to or from the Squamish Harbour, and although it is possible to land and disembark, access for float planes into the crowded harbour is challenging. There is one boat ramp for disembarking at the harbour. However, with the future development of the waterfront there are two more boat ramps planned for the east side of the harbour, and potentially more at the end of the harbour, which may change the feasibility of this option.

Options for Evacuation Using Float Plane Facilities

Similar to the local airports and helipads, it is likely that float plane infrastructure and floatplanes will be used to transport resources in and out of the evacuation zone. Floatplanes are particularly beneficial for moving staff, such as transit drivers, who are out of town at the time of the emergency.

Rail

There are railway tracks approximately parallel to the highway corridor throughout the evacuation zone. They primarily carry freight rail cars with the exception of the Rocky Mountaineer luxury passenger rail service.

CN RAIL TRACK

The rights to the train tracks running alongside Highway 99 are owned by CN Rail. The track can accommodate freight and passenger rail; currently one freight train per day runs along the track between Squamish and Whistler as well as the Rocky Mountaineer passenger train. More trains run depending on shipments between Squamish and Vancouver.

There is a working rail connection between Vancouver and North Vancouver that goes from the Pacific National Exhibition along Second Narrows Bridge through to the wheat pool in North Vancouver. This infrastructure would allow rail assets from Vancouver to travel up the Sea to Sky Corridor in an emergency.

At the request of the RMOW and DOS, EMBC met with CN to dicuss the use of CN infrastructure in an evacuation. CN has indicated they will assist where they can. A request to use CN infrastrucutre in an evacuation should go through EMBC.

Even with the necessary agreements in place, there are limitations with the use of rail in the Sea to Sky Corridor— the most serious is the slow speed limit currently in place. It would take a train approximately two hours to travel from Squamish to North Vancouver or from Squamish to Whistler. However, this slow speed should not discourage agreements from being put in place.

Options for Evacuation Using Rail

If the appropriate agreements were in place, rail could be advantageous to use in an evacuation, due to the high volume of people it could accommodate.

Transportation of People

Introduction

Once a mass evacuation is ordered for the RMOW or DOS, people within the community will need to select a method for evacuation. While the majority of people will evacuate via personal vehicle, the demographic data indicates that, particularly in the RMOW, some people will not have access to personal vehicles and will rely on other modes of transportation to evacuate. The Evacuation Design Scenarios identify that the RMOW could have in excess of 16,000 people without access to a personal vehicle, and the DOS could have somewhere around 2,000. Depending on the scenario, a mass evacuation in the RMOW or DOS may require the use of all viable public and private transportation resources. This section outlines the concept of operations for the transportation of people, as well as the different transportation options for evacuation, including personal vehicles, carpooling, and public and private transportation by bus, van, coach, rail, ferry and air. The specific evacuation scenario at the time of the emergency will dictate which transportation infrastructure is used, and in what capacity, to ensure the Plan is flexible enough to be effective.

Key questions that guided this section include:

- What are the strategies for decreasing congestion on the highway?
- Is phased evacuation an option?
- Is carpooling an option?

Concept of Operations for the Transportation of People

Coordinating the various multimodal transportation options in a mass evacuation will be a large task. The Emergency Operations Centre (EOC) of the impacted local government will coordinate the transportation of people in a mass evacuation, including evacuation routes; central pick-up points; carpooling pick-up points or checkpoints; public, private and accessible transportation resources; and requests for additional transportation resources from the Province. A specific transportation section of the EOC staffed by representatives from the local government, local transportation providers, the school district and private transportation companies will work to acquire, dispatch and track multimodal transportation resources based on the transportation needs of evacuees. Detailed checklists and resource lists, developed jointly by the local governments and local transportation providers are included in the Operational Evacuation Plan. The exact resources that will be used, and their specific use, will vary depending on the evacuation scenario, the location of the emergency, and the availability of resources at the time of the evacuation.

CENTRAL MUSTER POINTS FOR PEOPLE WITHOUT PERSONAL VEHICLES

People without access to personal vehicles will need to access transportation at designated pick-up points. The model for pick-up points for people without access to personal vehicles will be different depending on the urgency of the evacuation and congestion on the roads, and will be determined by the EOC, once the evacuation scenario is confirmed.

In advance notice evacuation scenarios, evacuees requiring transportation will be directed to walk or otherwise transport themselves to their nearest BC Transit bus stop. A bus—likely a local transit bus following its regular route—will pick up people and transport them to a central muster point for further transportation via bus, van, shuttle, rail or ferry out of the community. People in close proximity to a central muster point can walk there directly. It is worth noting that all scheduled transit services will be suspended at this point as transit resources are diverted to the evacuation of people.

In no-notice evacuation scenarios when there is not enough time for BC Transit buses to travel regular bus routes, due to the urgency of the evacuation and congestion on the roads and the highway, people will be directed to walk, cycle, or otherwise transport themselves to one of the pre-determined central muster points for further transportation via bus, van, shuttle, rail or ferry out of the community. In a no-notice evacuation scenario, in which transportation demand exceeds supply, people may be asked to limit their luggage to only what they can fit on their laps.

People will be notified on the evacuation alert and order and in public messaging about whether buses will be travelling regular neighbourhood routes or whether people need to travel directly to central muster points.

Central Muster Points in the RMOW

The RMOW has pre-identified 6 central muster points spread through the community. The muster points are:

- **Whistler Interpretive Forest Parking Lot** in Cheakamus
- **Creekside Parking Lot** – 2029 London Lane
- **Gateway Loop** – 4313 Village Gate Boulevard
- **Rainbow Park** – 5778 Alta Lake Road
- **Meadow Park Sports Centre** - 8625 Highway 99
- **First Entrance Emerald** – 9105 Emerald Drive

Again, best efforts will be made to have transit travel regular routes. Asking people to walk to central muster points will be a last resort.

Central Muster Points

1. **First Entrance Emerald**
   9105 Emerald Drive
2. **Meadow Park Sports Centre**
   8625 Highway 99
3. **Rainbow Park**
   5778 Alta Lake Road
4. **Gateway Loop**
   4313 Village Gate Boulevard
5. **Creekside Parking Lot**
   2029 London Lane
6. **Whistler Interpretive Forest Parking Lot** in Cheakamus

Central Muster Points in the DOS

The DOS has pre-identified 15 possible central muster points spread through the community. Depending on the nature of the hazard, a selection or all of the central muster point locations may be used in an evacuation situation (those chosen will be communicated to the public). The muster points are:

- **Squamish Nation Totem Hall** - 1380 Stawamus Rd
- **Ecole Squamish Elementary** - 38370 Buckley Ave
- **Brennan Park Recreation Centre** - 1009 Centennial Way
- **Mamquam Elementary** - 40266 Government Rd
- **Brackendale Elementary School** - 42000 Government Rd
- **Garibaldi Highlands Elementary** - 2590 Portree Way
- **Squamish Valley Golf & Country** - 2458 Mamquam Rd
- **Stawamus Elementary** - 38030 Clarke Dr
- **Valleycliffe Elementary** - 38430 Westway Ave
- **Sandman Hotel & Suites Squamish** - 39400 Discovery Way
- **Quest University Canada** - 3200 University Blvd
- **Cheakamus Centre** - 1600 Paradise Valley Rd
- **Squamish Montessori Elementary School** - 41273 Horizon Dr
- **Executive Suites Hotel & Resort** - 40900 Tantalus Rd
- **Evans Lake Forest Education Centre** - Levette Lake Forest Service Rd

Central Muster Points

1. Squamish Nation Totem Hall
2. Stawamus Elementary
3. Ecole Squamish Elementary
4. Valleycliffe Elementary
5. Sandman Hotel & Suites Squamish
6. Brennan Park Recreation Centre
7. Mamquam Elementary
8. Squamish Valley Golf & Country
9. Garibaldi Highlands Elementary
10. Quest University Canada
11. Executive Suites Hotel & Resort, Squamish
12. Squamish Montessori Elementary School
13. Brackendale Elementary School
14. Cheakamus Centre
15. Evans Lake Forest Education Centre
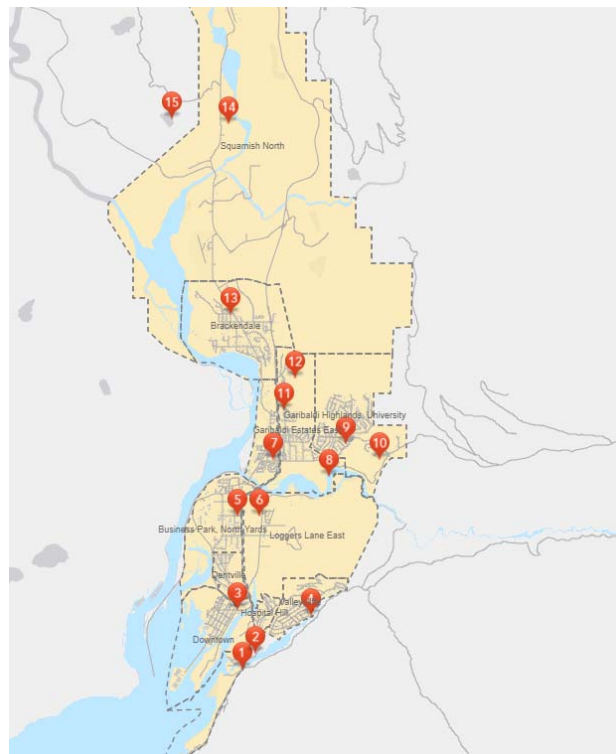
TRANSPORTATION FOR PEOPLE THAT REQUIRE ASSISTANCE TO EVACUATE

People who cannot travel to neighbourhood bus stops or central muster points will be directed to call the RMOW or DOS to arrange transportation directly from their residence. The call centre of the evacuating local government will receive the call and ask a series of questions to determine their transportation needs. This information will be forwarded to the EOC transportation section, who will then dispatch the most appropriate transportation resource available. Depending on the needs of the person requesting assistance and the availability of resources, a taxi, bus, shuttle, paratransit resource, ambulance or firetruck will be dispatched to their residence. A checklist including questions to ask, and details about accessible transit resources and what they can accommodate is available in the Operational Evacuation Plan.

Note: As part of the provincial BC Transit fleet, BC Transit has specific paratransit resources. Light duty buses in Squamish can accommodate up to four wheelchairs and the majority of the buses in Whistler can, depending on type and size, accommodate up to three wheelchairs. The local government should put in a resource request for a paratransit resource, as soon as a mass evacuation is considered, and definitely at the evacuation alert stage, so paratransit resources can be staged in the community before an evacuation order is issued. This is included in the Operational Evacuation Plan pre-evacuation checklist. A smaller paratransit bus would be ideal for accessing homes on roads that are narrow, have a steep grade, or do not have a place for a bus to turn around.

TRANSPORTATION OPTIONS FOR PEOPLE WITHOUT PERSONAL VEHICLES WITH PETS

In addition to people, pets must be evacuated when an evacuation order is issued, and cannot be left behind. People, who have pets and do not have access to personal vehicles, will need to bring their pets with them to pick-up points.

BC Transit buses will accommodate household pets in carry cases in an evacuation. For the purpose of this Plan, household pets are defined as domesticated pets (e.g. dogs, cats, birds, rabbits, rodents or turtles) that are traditionally kept in the home for pleasure, rather than for commercial purposes and can travel in commercial carriers and be housed in temporary facilities. Household pets do not include reptiles (with the exception of turtles), amphibians, fish, insects, arachnids or farm animals (including horses). Under routine circumstances, household pets not in carry cases, or that are too large for carry cases, are not permitted to ride on a BC Transit bus. In emergency situations for short distances, BC Transit may allow larger animals on leashes to travel on BC Transit buses. Ideally, there would be resources available to dedicate buses to people with pets and people that are comfortable riding with them. The decision to allow household pets onto private transportation is at the discretion of the owner of the vehicle. Confining pets on buses for long periods of time is not optimal.

LOCAL GOVERNMENT REQUESTS FOR ADDITIONAL TRANSPORTATION RESOURCES

Despite the many multimodal transportation options in the Corridor, it is highly unlikely that available transportation resources in the region will be sufficient to meet the demand for transportation in a mass evacuation. Transportation resources will be required from outside the region. At the request of local government EMBC will coordinate and provide additional transportation resources in support of evacuation operations. The local government should put in a resource request for extra transportation resources, ideally as soon as a mass evacuation is considered and definitely at the evacuation alert stage, so that additional resources can be sourced, staffed and moved into the community, before an evacuation order is issued. This is included in the Operational Evacuation Plan pre-evacuation checklist. Also included in the Operational Evacuation Plan is a formula for calculating the number of people, who may require transportation, so that the approximate number of resources required is known.

Personal Vehicles

In an evacuation, the majority of people will evacuate via personal vehicle. The main advantages to evacuation via personal vehicle include the ability for people to leave quickly; take supplies, personal items, and pets; choose their destination; and generally maintain a high level of self-sufficiency with little to no need for government assistance. The disadvantages of evacuation by personal vehicle are that having too many vehicles on the road will cause congestion on evacuation routes and place a high demand on a limited supply of fuel. In addition, it is difficult to control when people leave and the routes they take. In many cases, evacuees will take every car they have for fear that any vehicles left behind will be damaged, which contributes to additional road congestion and fuel demand. As part of the **Public Information** strategy, evacuees will be encouraged to take only the cars they need and to maximize the occupancy of their vehicles to increase the efficiency of the highway network.

Carpooling

An expanded version of using personal vehicles to evacuate is the concept of carpooling. Carpooling means that people evacuating in personal vehicles with available empty seats, pick up evacuees without personal vehicles. The advantages of carpooling are that it reduces congestion on evacuation routes, reduces the demand for fuel, supports people without personal transportation, reduces the number of buses needed to transport people without vehicles, and reduces issues with people wanting to bring more than one vehicle. Carpooling in a mass evacuation is a promising concept, as the RMOW and DOS do not have vehicle shortages: it is estimated that there are enough vehicles and seats in these communities to evacuate everyone in one go. The issue is that the vehicle seats are not dispersed evenly among the populations.

CONCEPT OF OPERATIONS FOR CARPOOLING

The concept of operations for carpooling will be different depending on the urgency of the evacuation. In advance notice evacuation scenarios, information promoting carpooling will be included in public information messaging prior to and during the evacuation. People will be encouraged to offer a ride to a friend or neighbor that does not have a vehicle or to register their empty seats on the ridesharing platform Poparide.

In a no-notice evacuation scenario, if there isn't sufficient time to bring in additional transportation assets and there is an immediate risk to people, the RCMP may stop drivers with personal vehicles and ask them to take someone without transportation to a safe location outside the community. Providing a ride would not be mandatory, but asking people directly would likely increase carpooling rates. If the highway is not congested and stopping traffic will not result in a longer evacuation clearance time, people will be encouraged through public information and highway signage to travel to central muster points on their way out of the community to pick up additional people.

Poparide

The Canadian peer ridesharing platform **Poparide** was explored as an option to coordinate carpooling in a mass evacuation. Poparide connects drivers with empty seats with people needing a ride; riders pay a reasonable fee to the driver for the ride. Poparide has significant potential in an evacuation to connect residents without vehicles with drivers with extra seats. Poparide confirmed that the RMOW and DOS could include their platform in the Evacuation Plan and publicize it in emergency preparedness materials and emergency alert messaging.

When drivers register a ride in Poparide, there is an option to allow bikes, skis, pets, and small, medium, or large luggage. Poparide could be a favorable option for someone with a pet or with more luggage than can be accommodated on public transit.

Poparide prices are capped at 15 cents per kilometer so there is no risk of surge pricing in an evacuation, as it is not possible to exceed the capped rate. Poparide does not have a feature to bill the RMOW and DOS directly for the service, so evacuees using the service would need to pay for the ride at the time of booking. After the evacuation, Poparide could invoice the local government and reimburse passengers for their bookings; this cost would then be included in the local governments claim to the Province for reimbursement.

Ground Transportation in the RMOW and DOS

As mentioned above, the data profiles for the RMOW and DOS indicate that many people, particularly in the RMOW, will not have access to a personal vehicle in an evacuation. People, who don't have a vehicle or cannot travel with a friend or neighbour or carpool will need to be provided with transportation out of the community. In most cases ground transportation (buses, shuttles, and vans) will be the most abundant and accessible option. The Sea to Sky Corridor has numerous ground transportation providers, both public and private, including public transit, school buses, private and non-profit paratransit operators, private transportation companies, taxi companies, hotel shuttles and vans, and adventure and tourism companies. A full list of ground transportation providers, who have agreed to assist in a mass evacuation, including contact information, capacity, fuel requirements, accessibility, and driver numbers and requirements, is available in the Operational Evacuation Plan.

The advantages of evacuation via ground transportation include decreased congestion on evacuation routes and demand for fuel. In addition, buses and vans take up far less space on the highway. When compared with a regular vehicle, even fully occupied, a transit vehicle is many times more space efficient. The table below provides a comparison of road space requirements per person in a fully occupied five-person car compared to a fully occupied bus. The transit vehicle is 12 times more space efficient.

Transit		
Vehicle Capacity	70	people
Length	12	m
Lane Width	3.6	m
Headway (Time)	2	s
Speed (km/h)	100	km/h
Speed (ms)	27.7778	ms
Headway (Distance)	55.5556	m^2
Road Space Required at 100 km/h	243.2002	m^2
Space Efficiency (Space per person)	**3.474288**	**m^2**
Car		
Vehicle Capacity	5	people
Length	5	m
Lane Width	3.6	m
Headway (Time)	2	s
Speed (km/h)	100	km/h
Speed (ms)	27.7778	ms
Headway (Distance)	55.5556	m
Road Space Required at 100 km/h	218.0002	m^2
Space Efficiency (Space per person)	**43.60003**	**m^2**
TRANSIT IS	**12.549343**	**times more space efficient**

CONCEPT OF OPERATIONS FOR GROUND TRANSPORTATION

As mentioned in the previous Section, the concept of operations for people without access to personal vehicles will be different depending on the speed of onset of the evacuation and the congestion on the roads, and will be determined by the EOC, once the evacuation scenario is confirmed.

In advance notice evacuation scenarios evacuees will be directed to walk or otherwise transport themselves to their nearest BC Transit bus stop. A bus—likely a local transit bus following its regular route—will pick them up and transport them to a central muster point for further transportation via bus, van, shuttle, rail, or ferry out of the community. Using local transit buses for neighbourhood pick-up is optimal, because local transit drivers are familiar with local neighbourhoods and bus routes, and operate on a common communication platform. The rationale for travelling regular bus routes in an advance notice scenario is that people that use the bus are already familiar with bus stop locations, bus stops are a shorter walk then central muster points, and public messaging is more straightforward, as people can be directed to "go to their nearest bus stop and a bus will pick you up."

In a no-notice evacuation in which there is not time for BC Transit buses to travel regular bus routes due to the speed of onset of the evacuation and congestion on the highway, people will be directed to walk or otherwise transport themselves to a central pick-up point, and then will be provided with transportation to a shelter outside the community.

To limit confusion at the time of an evacuation, the public education campaign designed to educate residents on what to do before and during an evacuation, will focus on central muster points. The reason for this is that transportation will be available at central muster points during both advanced notice and no-notice evacuation scenarios. The simple messaging of "know the location of your closest central muster point" or "go to your closest central muster point" will limit confusion and ensure we are not educating people to go to a bus stop where a bus may not come if the evacuation is no-notice. if the evacuation is an advanced-notice scenario and there is time for buses to travel regular routes and stop to all bus stops, this information will be provided in messaging at the time so that people do not have to travel farther than necessary.

Depending on the nature of the emergency, the timing of onset, and the time of day and year, ground transportation resources may be dispatched to specific facilities to move larger groups, who do not have access to transportation. These could be the Whistler Health Care Centre, Squamish General Hospital, Squamish Hilltop House, schools, daycares, or other groups of people, who cannot easily board transit buses at neighbourhood or central pick-up points. Additional uses for ground transpiration resources may include transporting emergency personnel and equipment to an incident site, providing the EOC with real-time information on the extent of damage, and providing temporary shelter for emergency personnel or evacuees.

If an evacuation order is issued, buses would be free of charge to the rider, and transit would be compensated by the Province.

Marine

FERRY

As mentioned in the previous section, there is ferry capacity at Horseshoe Bay, Porteau Cove, and Darrell Bay. The Porteau Cove and Darrell Bay ferry docks can accommodate a ferry approximately the size of the Queen of Coquitlam. A full list of ferries that can dock at Porteau Cove and Darrell Bay is available in the Operational Evacuation Plan. BC Ferries does not generally have any spare vessels in operation, so most likely, a vessel being used for an evacuation would need to be re-allocated from another dedicated route. The diversion of a vessel from one route to another has a significant impact on communities reliant on ferry services. To request a ferry the local authority would need to submit a request to EMBC for BC Ferries support, and at the direction of the Province, BC Ferries would make resources available. Most likely, the Horseshoe Bay/Langdale ferry would be diverted to Porteau Cove or Darrell Bay, as it is nearby and has been approved to dock at either location. Detailed information is available in the Operational Evacuation Plan.

Concept of Operations for Ferry

The general concept of operations for ferries in an evacuation is for transporting people without access to vehicles (foot passengers). The ferry is not a good option for vehicles at the emergency ferry docks, as the ferry lineup would impede vehicle traffic. The ferry is a good option for walk-on passengers, when there is a need to reroute buses back to the RMOW or DOS without taking passengers all the way to the Lower Mainland.

For ferry service, evacuees would be directed to walk or otherwise transport themselves to Porteau Cove or Darrell Bay or would arrive by bus from a neighbourhood or central muster point for transportation out of the region by passenger ferry service to Horseshoe Bay.

ROYAL CANADIAN MARINE SEARCH AND RESCUE

Royal Canadian Marine Search and Rescue's (RCMSAR) primary function is to support the Canadian Coast Guard's federal marine search and rescue mandate. A secondary function is to support local governments and provincially-mandated response agencies in support of their respective emergency jurisdictions on a request for assistance basis. This support is formalized in an Emergency Humanitarian Assistance Memorandum of Understanding (MOU). As part of the agreement RCMSAR must have special permission to support a local government emergency response that exceeds 10 nautical miles from their home base.

RCMSAR has 33 active SAR stations, including a station in Squamish, and over 50 dedicated SAR vessels ready to deploy 24 hours per day to provide support. The Squamish RCMSAR station has a T-Top vessel, pictured below. A request to seek support in an emergency response should go through EMBC.

Options for Use of RCMSAR in an Evacuation

In an emergency RCMSAR may perform the following activities as outlined in the MOU:

- Inland waters Search and Rescue (SAR) and ground SAR mutual aid;
- On-water command, control and communications platforms;
- On-water transportation assistance for EMBC approved responders and representatives to access incident or response locations;
- On-water transportation assistance for personnel under the care of EMBC approved responders (e.g. BC Ambulance Service with patients under care);
- On-water observation and reporting of emergency incidents and incident impacts to support
- situational understanding;
- On-water safety patrols and emergency first aid;
- On-water recovery of human remains; and
- Personnel augmentation support to provincial, local governments and related community agencies (e.g. emergency social services, emergency operations centers, etc.).

In an evacuation, RCMSAR may use their vessels to transport evacuees, if they are not able to evacuate by road or if they are considered to be at immediate risk. Detailed information on RCMSAR assets and information required when requesting assistance is available in the RCMSAR Request for Assistance Guide.

ROYAL CANADIAN NAVY VESSELS

Local government and provinces are the first to respond in an evacuation. If they become overwhelmed, they may ask the Canadian Armed Forces (CAF) for assistance. This includes assistance from the Royal Canadian Navy (RCN). More details on CAF resources can be found in the **Roles and Responsibilities** section of the document.

OPTIONS FOR USE OF RCN IN AN EVACUATION

In a mass evacuation, if people need to be accessed or moved on water, and local and provincial resources are inadequate, a request could be made through EMBC to the Regional Joint Coordination Centre in Victoria to access the RCN.

Rail

As discussed in previous sections, CN rail has indicated they will assist where they can in an evacuation. The request for the use of the CN rail infrastructure go through EMBC. If the Province gains permission to use CN infrastructure Translink and the West Coast Railway Association have passenger train assets that may be utilized in an emergency.

TRANSLINK

If EMBC is successful in gaining approval to use CN Rail tracks in an emergency, Translink should be able to travel up the Sea to Sky Corridor. Ideally, EMBC would requisition passenger rail cars from the West Coast Express line to transport passengers out of the Whistler and Squamish regions under a state of emergency but this is not yet confirmed through agreements.

WEST COAST RAILWAY ASSOCIATION

The West Coast Railway Association in Squamish has agreed—pending approval between the Province and CN Rail - to provide the use of their passenger rail cars and locomotives in a mass evacuation of the RMOW or DOS. The West Coast Railway Association has the capacity for approximately 500 passengers. The configuration of the cars varies and includes passenger cars with seats and open cars without seats. As mentioned in the previous section, there are currently some limitations on the use of rail, but if these limitations are overcome, rail would be a great option in an evacuation. Detailed information is available in the Operational Evacuation Plan.

CONCEPT OF OPERATIONS FOR RAIL

The general concept of operations for rail in a mass evacuation, if the Province is successful in gaining the necessary permissions and resources, is for transporting people without access to vehicles (i.e. walk-on passengers). For rail service, evacuees would be directed to walk or otherwise transport themselves to a rail pick-up point or would arrive by bus from a neighbourhood or central muster point for transportation out of the region by passenger rail service.

Air

While there are no commercial airports in the Sea to Sky Corridor, both Squamish and Pemberton have small airports, heliports, and float plane services. In most cases, the RMOW and DOS would work directly with local helicopter and floatplane companies and request the use of their resources as needed. If larger commercial aircraft are required, EMBC would obtain aircraft and coordinate air operations at the local airports. The CAF has aircraft that can land at both Pemberton and Squamish airports at the request of EMBC. A list of local and CAF air assets can be found in the Operational Evacuation Plan.

CONCEPT OF OPERATIONS FOR AIR

Neither aircraft, floatplane, nor helicopter are capable of moving high volumes of people in a mass evacuation, but air modes would be beneficial for some evacuation needs. The concept of operations for air in most cases would be to use assets for emergency response operations, such as firefighting, and to transport resources, such as first responders and equipment. In specific cases air assets may be used to evacuate injured people or to rescue people, who are stranded and at immediate risk. The GIS map outlines the different landing areas in the RMOW and DOS, and the size of helicopter that could land there.

Evacuation Strategies

There are several strategies, techniques, and tools available to direct and control traffic during an evacuation. Evacuation strategies are implemented to best manage or enhance the capacity of the highway, modify routes to keep traffic moving, and manage the evacuation safely. As discussed in previous sections, the Sea to Sky Corridor has limited highway infrastructure, and a mass evacuation in the RMOW or DOS will likely overwhelm the capacity of the highway. As a result, during an evacuation of the RMOW or DOS, evacuation strategies will be required to reduce congestion and keep traffic moving. Traffic congestion in evacuations is well-documented and is known to lengthen evacuation clearance times, contribute to evacuee discomfort and stress, and increase the demand for en route services such as food, water, fuel, emergency response vehicles and tow trucks. This section provides detail on the different evacuation strategies available to the RMOW and DOS.

Key questions that guided this section include:

- How can we best manage or maximize the capacity of the existing transportation infrastructure using traffic management strategies?
- How do strategies impact evacuation clearance time?

The specific evacuation scenario at the time of the emergency and the availability of resources, will dictate which strategies are implemented and in what capacity. Not all evacuation strategies will be viable or appropriate in every evacuation scenario. This section should be considered an evacuation toolbox for decision makers, meaning that only those strategies required and viable for the specific evacuation scenario will be implemented. An overview of each evacuation strategy is provided in this section. Detailed checklists for implementing the specific evacuation strategies and locations where the evacuation strategies may be effective are included in the Operational Evacuation Plan.
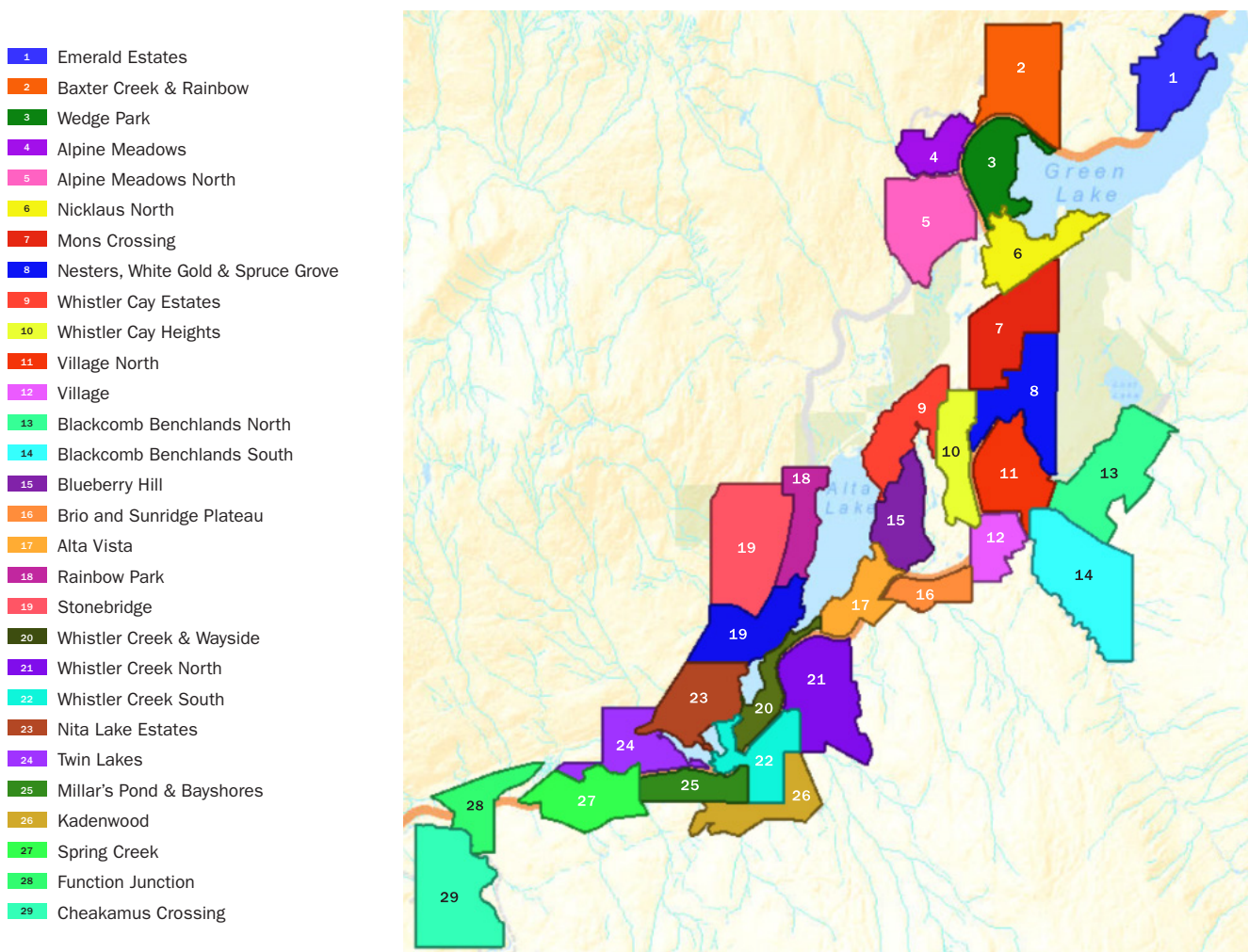
Evacuation Zones

As part of evacuation planning, both RMOW and DOS have identified evacuation zones. Evacuation zones delineate the population by area for the purpose of location-specific evacuation planning and response. During the evacuation planning phase, evacuation zones allow officials to evaluate the hazards, demographics, emergency traffic demand and egress routes of specific areas. During evacuation response, evacuation zones allow officials to issue evacuation alerts and orders to specific areas and to provide tailored information and instructions by location. Evacuation zones allow officials to provide residents and visitors with clarity on what actions they need to take based on their location and proximity to the hazard. It's critical that residents and employees know which evacuation zone they live or work in.

EVACUATION ZONES IN THE RMOW AND THE DOS

In the RMOW and the DOS, evacuation zones directly align with pre-existing neighborhoods. Neighborhoods were selected as evacuation zones because residents are usually familiar with their neighborhood name. Additionally, neighborhoods have access to Highway 99, the main evacuation route in an emergency. It is critical that residents know their zone so they know if they are ordered to evacuate or not.

Map of Evacuation Zones in the RMOW

1 Emerald Estates
2 Baxter Creek & Rainbow
3 Wedge Park
4 Alpine Meadows
5 Alpine Meadows North
6 Nicklaus North
7 Mons Crossing
8 Nesters, White Gold & Spruce Grove
9 Whistler Cay Estates
10 Whistler Cay Heights
11 Village North
12 Village
13 Blackcomb Benchlands North
14 Blackcomb Benchlands South
15 Blueberry Hill
16 Brio and Sunridge Plateau
17 Alta Vista
18 Rainbow Park
19 Stonebridge
20 Whistler Creek & Wayside
21 Whistler Creek North
22 Whistler Creek South
23 Nita Lake Estates
24 Twin Lakes
25 Millar's Pond & Bayshores
26 Kadenwood
27 Spring Creek
28 Function Junction
29 Cheakamus Crossing

The Neighbourhoods of Squamish

- Brackendale
- Business Park, North Yards
- Dentville
- Downtown
- Garibaldi Estates East
- Garibaldi Estates West
- Garibaldi Highlands, University
- Hospital Hill
- Loggers Lane East
- Squamish North
- Squamish South
- Valleycliffe
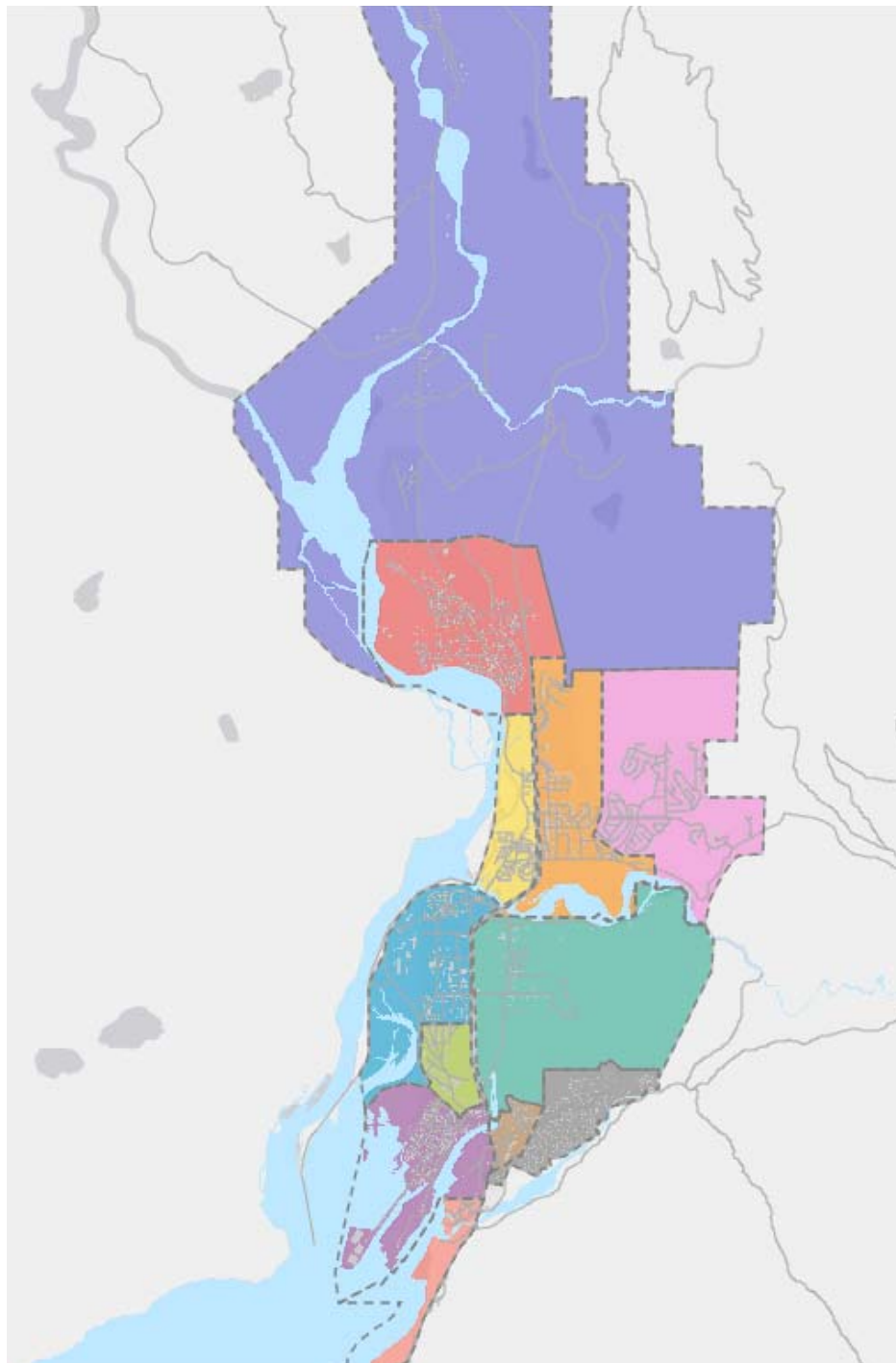
Evacuation Phasing

Evacuation phasing involves scheduling the departure times of evacuees by evacuation zone, so people evacuate in stages, rather than all at once, to reduce congestion on roadways. Although the goal of an evacuation is to move endangered people away from a threat as quickly as possible, a single concentrated travel departure pattern can inhibit overall traffic movement, particularly where there are critical constraints, such as intersections and merging lanes. In addition, because evacuations usually involve movement in a single direction away from the hazard, evacuees closest to the hazard can sometimes experience the longest travel times. The evacuation demand modelling described earlier in the document, illustrates that a phased evacuation will take longer, but will provide a better controlled condition with lower highway volumes that avoid backups and reduce driver travel times out of the community. Whenever possible, a phased evacuation is preferable. However, the practicality of compliance with phasing may be difficult if people perceive a serious threat.

There are different strategies to implement phased evacuations, and the specific evacuation scenario at the time of the emergency will dictate if, and in what capacity, a phased evacuation is implemented. These strategies include:

1. Issuing sequential evacuation orders that begin evacuations in areas closest to the hazard first, and then working away from the hazard. This ensures that people most at risk are moved out of the hazard area first.

2. Issuing evacuation orders to evacuation zones closest to the outbound end of the community first and working backwards across the community. This strategy moves the outbound neighbourhoods out of the way, so inbound traffic can move through.

3. Evacuating the neighbourhoods with the densest population areas first, as this will take the longest.

4. Asking non-resident populations to leave during the evacuation alert stage to reduce the number of people that need to evacuate once the need for evacuation is confirmed and an evacuation order is issued.

5. Allowing people, who will take more time to evacuate (e.g. people with disabilities or medical health issues), to leave first to ensure they have the time they need to evacuate safely.

Note: Because it is impossible to enforce phased evacuations, they are a guidance-only strategy and will need to be included in public education prior to an evacuation, and once an evacuation is possible or confirmed. Public information is important to avoid shadow evacuees: people outside a declared evacuation zone, who evacuate unnecessarily or at the incorrect time. Shadow evacuees congest roadways and inhibit the egress of those evacuating from an area at risk.

Destination Assignment

Another strategy to modify demand in an evacuation is to assign evacuees to specific destinations. Destination assignment involves assigning evacuees to specific routes and destinations to decrease congestion on main evacuation routes. This strategy involves asking or directing evacuees, or in a worst-case scenario implementing road blocks to compel compliance to a specific route or destination. In the RMOW and DOS this would likely involve asking or directing some people to evacuate north, as one assumption is that congestion will be heavier heading south if evacuation routes to the south are open.

While destination assignment is an option, it is preferred that people are able to select their own route and destination, as they are more likely to have support at their preferred destination. If circumstances justify destination assignment, it is preferred that it be voluntary. Making destination assignment mandatory by way of a road block should be a last-resort option, as it can force people to unfamiliar areas where they lack support, and separate families and friends. Only in the most immediately life-threatening situations should people be evacuated without being able to gather their family, friends and pets.

Traffic Management Strategies

Many traffic management strategies exist to help expedite the evacuation process and are listed below. While all of the strategies are intended to improve evacuation traffic flow, any potential impacts should be considered in decision-making.

Implementing traffic management strategies in an evacuation are complex. To ensure that traffic management strategies are coordinated and implement safely, a Traffic Management Plan (TMP) will be included in the Operational Evacuation Plan. The TMP will outline the specific traffic control devices that will be used and how they will be implemented. This may include text descriptions, customized traffic control layouts, and customized drawings of temporary traffic control devices (signs, signals, lighting, channelizing devices, pavement markings, etc.) and traffic control persons. The TMP will meet the standards of MOTI'S **Traffic Management Manual for Work on Roadways.**

DETOURS

Diversion (detour) is a strategy to decrease congestion in an evacuation. Diversion is defined as directing people to alternate or preferred routes to avoid a hazard area or to reduce traffic on main routes. There are limited options for diversions in the Sea to Sky Corridor, as there is no parallel alternate route to Highway 99. Diversions may be localized around a specific hazard or implemented further afield to warn drivers far in advance of the evacuation area. For example, if an evacuation were ordered for Whistler, traffic from Lillooet to Vancouver would be diverted through Hope.

ROAD CLOSURES AND CONTROLLING ACCESS

The closure of roads or road segments can help manage traffic during mass evacuations. Road closures may be used to limit traveller exposure to the hazard, divert traffic to preferred routes or destinations, limit the cut-through traffic into areas not equipped to accommodate increased demand, and prevent re-entry to the community before an evacuation order is lifted. For example, there may be a need to close Alta Lake Road in Whistler to discourage local traffic from using that route and creating increased congestion at the south end of the community. Law enforcement or barricades will be required to implement road closures.

Restricting Inbound Traffic to Emergency Services

Whistler and Squamish have finite access to local emergency services and transportation resources. In a mass evacuation there will most likely be a need to bring in additional resources to support evacuation operations. If an evacuation order is issued in either the RMOW or DOS, inbound roads will be closed into the evacuating community, and entry will be restricted to emergency services and essential personnel and resources or those that are otherwise authorized to do so. Essential personnel and resources include first responders, bus drivers, health care workers, fuel trucks and drivers, etc. Law enforcement or security personnel will be required to implement road closures and confirm that those entering are essential personnel or transporting essential resources. This ensures that emergency vehicles can access the emergency area and that unauthorized vehicles cannot. See the Moving Critical Staff section for more information on special access.

Note: If an Evacuation Order for RMOW or DOS was issued and road closures implemented for inbound traffic, it is essential that emergency officials share this information with West and North Vancouver or implement an additional road block at the South end of the highway so that people do not travel all the way up the Sea to Sky to find that the highway is closed.

WORK ZONES

If an evacuation alert or order is issued in the RMOW or DOS, MOTI will require that contractors cease all construction activities, clear all equipment, and open all lanes of traffic, including those under construction, if safe to do so, to accommodate evacuation traffic through work zones.

TRAFFIC CONTROLLERS

Traffic controllers provide direction to motorists during an evacuation. Traffic control or law enforcement personnel will be used on evacuation routes to implement and enforce road closures, stop or divert traffic, and ensure orderly movement of traffic. Often, active traffic control is needed to aid the flow of traffic at critical intersections. For example, traffic trying to access the highway via any stop-controlled intersection will have difficulty joining an already congested flow of traffic. Traffic control personnel can assist in stopping highway traffic to allow side road traffic to evacuate. This, however, reduces highway capacity and is a challenge when there is a no-notice mass evacuation. Wherever possible, a phased evacuation can be used to reduce conflicts, but will likely still require traffic control personnel to evacuate neighbourhoods in a timely manner.

Flashing Signals

At certain intersections where traffic controllers are in place to direct motorists, traffic signals may operate in flash mode to indicate to drivers that the traffic controller is directing traffic, not the signal. This method of operation may reduce capacity on the highway, but can help to quickly evacuate a neighbourhood. Any neighbourhood under immediate threat from a hazard should consider this method of operation.

TRAFFIC CONES AND DELINEATORS

Traffic cones and delineators will be used along with signage to indicate road closures, diversions, reconfigured lanes, and other hazards. Cones and delineators may be used to separate traffic travelling in opposite directions and to guide traffic to use a lane typically used for traffic moving in the opposite direction.

EVACUATION LANE RECONFIGURATIONS

Evacuation lane reconfiguration is defined as using one or more travel lanes of a highway to move traffic in the opposing direction for the purpose of enhancing highway capacity in the outbound direction. The number of lanes along Highway 99 varies from two to four. In sections where there are a minimum of three lanes, it is feasible to reverse one lane to create two temporary lanes out of the community. The evacuation demand modelling illustrated that evacuation clearance times could be reduced by as much as five hours depending on the scenario. This is an option, specifically, either northbound or southbound for the highway between Function Junction in Whistler and Depot Road in Squamish. Due to single-lane restrictions at Porteau Cove, where there are only two lanes with rock face on one side and rail tracks on the other, and Murrin Park, evacuation lane reconfiguration is not an option south of Squamish. MOTI estimates that it will take approximately three to four hours under good conditions with normal staffing levels to set up the highway to facilitate two outbound lanes.

Lane reconfiguration has issues, and while the concept is simple, the implementation is complex. Potential issues include:

- the introduction of unusual features to drivers under stressful driving conditions;
- requirement for extensive traffic management strategies;
- the need for median barrier removal in some locations;
- potential for bottlenecking where there are capacity constraints downstream; and
- placing additional demand on limited resources (e.g. because lane reconfiguration requires law enforcement at each major interchange), during a time when it may be vital to have these resources available for other purposes.

Evacuation lane reconfiguration should be considered a last resort option, and should only be used during daylight hours to reduce the incidence of driver confusion and traffic accidents.

Associated with the issue of lane reconfiguration is the timing of the call for the evacuation order by decision makers. It is preferable to make the decision to evacuate early, when there is still sufficient time to evacuate using the transportation infrastructure as it was designed, avoiding the need to implement lane reconfiguration. Decision-making, including timing of an evacuation order, is discussed in detail in section Evacuation Process.

Use of RCMP Pilot Vehicles for Evacuation Lane Reconfiguration

In a no-notice evacuation scenario in which there is immediate risk to a neighbourhood or the community and insufficient time to set up two outbound lanes effectively, the RCMP may lead the evacuation using pilot vehicles on two outbound lanes. Again, due to the complexity of implementing this system, this method should only be used in extenuating circumstances, and the decision to implement it is at the discretion of the RCMP. Generally, after about 50 cars, pilot systems are not as effective, so this would be best reserved for small groups.

HIGHWAY SIGNAGE

Signage is an effective strategy to guide traffic and provide information to road users during an evacuation. Specifically, signage can be used to manage traffic, emphasize important messages, alert drivers to upcoming road conditions or changes to intersection controls or lanes, outline downstream conditions, or prevent access. Road signs may also indicate a central pick-up point, or locations where evacuees can access more information or shelter resources. Types of signage available in the Sea to Sky Corridor include Dynamic Message Signs (DMS), Portable Changeable Message Signs (PCMS) and printed signage. All DMS and PDMS messages must meet the standards of MOTI's **Guidelines for the Use and Operation of Portable Changeable Message Signs.** Printed signs must meet the standards of **MOTI's Manual of Standard Signs and Pavement Markings.**

Dynamic Message Signs

Dynamic Message Signs (DMS) refer to permanent signs on the highway that electronically display travel and road condition information to road users. They are called dynamic because their electronic messages can be changed. Control of DMS signs is coordinated through the Regional Traffic Management Centre in Burnaby.

There are several existing DMS along the Sea to Sky Highway:

- Whistler west of Alta Lake Road (southbound);

- Squamish – one south of Squamish Valley Road (northbound), one south of Alice Lake Road (southbound), Squamish Valley Road (northbound), and one south of Valley Drive (southbound); West Vancouver – one at Westmount intersection (northbound), and one west of 15th Street (southbound).

There are also DMS signs north of Cache Creek, in Kamloops, and in Hope that could be used to implement detours around the Sea to Sky Corridor if an evacuation was in progress.

DMS should include a single message that identifies what the event is (e.g. flood), its impact (e.g. road closure), and how the road user is required to respond (e.g. detour via Alta Lake Road); this last part may be optional depending on the nature of the message. Generally, MOTI message boards have a minimum of two lines with 22 characters per line, resulting in a message size of 44 characters. Messages are displayed in two phases, and cycled so road users can read the messages twice at travel speed. Public emergencies and safety broadcasts have message priority. Emergency DMS message displays may be authorized by the MOTI District Transportation Manager or delegate. Sample messages that meet the guidelines are available in the Operational Evacuation Plan.

Portable Changeable Message Signs

Portable Changeable Message Signs (PCMS) are shoulder or vehicle mounted temporary traffic control devices that may be used in advance of a condition to warn and advise road user of hazards or temporary conditions that may affect driving or travel routes. There are many PCMS owned by a variety of agencies and available for use in the Sea to Sky Corridor. An inventory is available in the Operational Evacuation Plan. Typically, PCMS are limited to three lines with eight characters per line resulting in a maximum message size of 24 characters. Some PCMS provide full matrix boards capable of displaying symbols to enhance the messaging. These symbols may be displayed with or without text. Changeable message sign displays may be authorized by the MOTI District Transportation Manager or delegate.

Printed Signage

Stop signs, detour signs, arrow signs, and road closed signs may be printed signs that are temporary during an evacuation.

HIGHWAY SPEED

The speed limit on Highway 99 varies between 60 km/h through Lions Bay up to 90 km/h under normal conditions. Highway 99 between the DOS and RMOW is a variable speed limit corridor meaning that the speed limit will change based on highway conditions. The speed limit is displayed on bright digital signs. In an evacuation, the speed limit may be reduced, particularly, if evacuation lane reconfigurations are implemented. North of Whistler, tight curves often reduce the speed limit to as low as 20 km/h.

SIGNAL TIMING MODIFICATION

Another traffic management strategy in an evacuation is modifying traffic signal timings, which affect the throughput of a lane at intersections. Specific strategies include implementing peak-hour timings to give priority to the highway, or setting the signal to flashing and having law enforcement direct traffic manually.

As part of the transportation analysis, ISL reviewed traffic signal timings. They determined that at most intersections on the highway, the routine signal timings will be more effective to keep traffic moving, than switching to flashing mode with traffic control personnel. While it may seem compelling to implement peak-day signal timings at each intersection to give priority to highway traffic, there will still be a need to allow neighbourhood traffic to access the highway. Also, as described in Highway Lane Capacity section traffic signals are programmed to stay green for longer periods, if there is no traffic approaching the intersection from the minor road, which means that if there is no demand from neighbourhoods, throughput should be maintained.

While routine traffic signal timing is effective in most cases, ISL did identify specific intersections that are likely to reduce the throughput and may benefit from having law enforcement operate traffic signals manually or hold pedestrians and have them cross together at longer intervals, rather than having pedestrians continually triggering a walk signal.

In a scenario where the routine signal timing is not effective, there is the option of implementing peak-period timing to give priority to the highway.

Traffic signal timings along the Corridor can only be changed manually from the signal control cabinet, requiring personnel with expertise. The time required to do this may not yield significant benefits, over leaving them to run as planned. There could be benefits to having the signals upgraded to allow remote viewing of the Corridor and remote control from the Regional Traffic Control Centre, but this would come at a cost.

En Route Services

During a mass evacuation, evacuees will need support en route to keep moving. Making provisions, such as fuel stations, portable restrooms, water, tow trucks, dispersed emergency services, and shelter opportunities along the evacuation routes will improve the effectiveness of an evacuation. As part of the transportation analysis ISL reviewed locations, which would be appropriate for providing these services, and these are generally displayed on the GIS Map as pull-outs.

FUEL

Ensuring adequate fuel supplies is a key component to a successful evacuation. Fuel service must be maintained during emergencies both at pump stations in the evacuating community and at service stations en route.

Local gas stations will be notified of a mass evacuation, as early as possible, even if the potential for evacuation is not yet confirmed, to enable them to top up their fuel supplies in preparation for the surge in demand. If time and resources allow, fuel trucks will be staged at various locations en route to provide emergency fuel supply and avoid stalled vehicles interrupting traffic flow.

Depending on the evacuation scenario, the EOC may want to consider rationing fuel to a dollar or litre limit to help avoid fuel outages. It is common during emergencies that people panic buy fuel and buy more than they need, which worsens fuel shortages. Rationing would not apply to shuttles, buses and emergency vehicles.

TOW TRUCKS

Tow trucks will be stationed to aid vehicles blocking traffic lanes because of mechanical problems, running out of fuel or collisions. Minor vehicular incidents, such as stalled vehicles or fender benders, may reduce traffic capacity on the highway. During an evacuation, tow trucks may be stationed along evacuation routes to help detect and clear traffic impediments to maintain the highway's capacity.

TEMPORARY COMFORT STATIONS

If time and resources allow, temporary comfort stations will be set up along the evacuation route with portable toilets and water to augment existing rest areas on route.

LAW ENFORCEMENT

If time and resources allow, law enforcement will be dispersed along evacuation routes to be able to respond to incidents.

Communication to Neighbouring Communities

It is essential that there is communication with neighbouring areas, especially when a mass evacuation will impact other communities and areas. The EOC will notify neighbouring communities, and in some cases will request that those communities refrain from using the highway and support resources. Notification will also be provided to food outlets and gas stations to let them know they may experience increased volume and ensure that gas stations stay open.

Security in Evacuation Zones

The evacuated area could be at risk from thieves and looters. Unless the danger to life is immediate and obvious, people will be reluctant to leave their homes without assurance that measures are being taken to guard their property against burglary and looting, while they are absent. Adequate measures must be taken to prevent the access of unauthorized persons to the evacuated areas. Road closures into evacuation zones and regular patrols of zones by law enforcement will be maintained, as long as resources allow and the safety of law enforcement personnel is not compromised.

Options Considered to be Unfeasible

CONTRAFLOW

ISL and the Steering Committee reviewed the potential for contraflow, meaning using all available lanes for outbound traffic, but ruled this option out entirely. Given the limited emergency response and transportation resources in the Sea to Sky Corridor, it will be necessary to leave one inbound lane for incoming resources and for emergency vehicles to travel to accidents and other emergencies en route.

EVACUATION LANE RECONFIGURATION BETWEEN SQUAMISH SOUTH AND WEST VANCOUVER

ISL and the Steering Committee reviewed the potential of implementing two outbound lanes from Squamish South to West Vancouver. This option is not feasible, because the highway is two lanes in some sections.

BUS AND HIGH-OCCUPANCY VEHICLE LANE

ISL and the Steering Committee reviewed the potential for giving buses and high occupancy vehicles priority on the highway during an evacuation to encourage people to fill their vehicles. However, given the significantly limited highway infrastructure in the Sea to Sky Corridor, reserving a lane for specific groups is too complex.

Infrastructure Enhancements

Infrastructure enhancements have a high capital cost associated with them. Nevertheless, because such improvements would be permanent, they would offer benefits during other peak traffic periods. Some options to increase capacity or allow for better management include:

- Adding a double left turn lane from Lorimer Road to Highway 99 southbound. This would requires the Lorimer road right turn to Highway 99 southbound to become a yield control and would require realignment of some island and signal controls.

- Expanding the highway to three or four lanes through Whistler to allow two lanes to be used out of the community in an evacuation.

- Expanding more sections of Highway 99 to four lanes between Squamish and Whistler to aid evacuation between these two communities.

- Adding remote signal control to all signals along the highway to allow the Regional Traffic Control Centre to better monitor and adapt signal timings for specific evacuation needs. For example, placing all neighbour-hoods on minimum green times, except those being evacuated.

Evacuation Authority, Types and Process

An evacuation order is issued when the risk to life of remaining in place is assessed to be greater than the risk of evacuation. Under the Emergency Program Act, local governments have the legal authority to evacuate their populations, if the safety of people or property are at risk. Despite the dynamic nature of evacuations, evacuations are generally categorized in two ways: advance notice or no-notice (also termed tactical). The type and scale of the emergency will determine the type of evacuation that is ordered. Then, depending on the category, evacuations follow a general process. Both types of evacuations and their respective evacuation processes are described in this section.

Key questions that guided this section include:

- Who has the legal authority to order a mass evacuation? Under what conditions?
- How is the decision to evacuate a community made?
- What information do they need to make the decision?

Authority to Order an Evacuation

The legal authority most commonly used by municipal officials to order an evacuation is the Emergency Program Act (1993) Section 12(1). Under this section a municipal council via bylaw or resolution, or the mayor by order, is permitted to declare a state of local emergency giving legal power to "cause the evacuation of persons and the removal of livestock, animals and personal property that is or may be affected by an emergency or a disaster and make arrangements for the adequate care and protection of those persons, livestock, animals and personal property." To access the emergency measures listed in the Emergency Program Act, the RMOW or DOS would need to declare a state of local emergency.

The EOC Director will oversee the process of preparing the documentation required to declare a local state of emergency and is responsible for briefing mayor and council and for attaining the appropriate approval and signature from the mayor. See the Operational Evacuation Plan for a Declaring a Local State of Emergency flowchart and evacuation order template.

ALTERNATE MEASURES OF AUTHORITY TO ORDER AN EVACUATION

In addition to the Emergency Program Act, there are a number of other legislative measures available to order an evacuation in British Columbia and these vary depending on the type of threat and the amount of time before the emergency occurs. There are several agencies and jurisdictions that have legal authority to close areas and order evacuations under various statutes. These are identified in the chart below.

Heading	Heading
DOS Emergency Measures Bylaw No. 1483, 1997	Section 4.2 of the DOS *Emergency Measures Bylaw* states that Council, by bylaw or resolution, or the Mayor by order, may declare a State of Local Emergency to effectively deal with an emergency or disaster in any part of the Municipality. This then allows implementation of procedures to prevent, respond to or alleviate the effects of an emergency or a disaster, including causing the evacuation of persons, animals, and personal property from any part of the municipality that is or may be affected by an emergency or a disaster.
DOS Fire Service Bylaw, 2314, 2014	The DOS *Fire Protection and Fireworks Bylaw* allows the Fire Chief (or any person duly authorized by the Fire Chief to exercise any of the Fire Chief's powers) to enforce the *Fire Code, the Fire Protection and Fireworks Bylaw,* and any other bylaws, rules, orders and regulations of the District for the prevention and suppression of fire and the protection of life and property; and to exercise the powers of the Fire Commissioner under section 25(1) to (4) of the *Fire Services Act,* including evacuation of a building or area due to threat from fire or explosion.
Emergency Program Act	Section 12(1) of the *Emergency Program Act* permits Council via bylaw or resolution, or the Mayor by Order, to declare a local state of emergency. This then allows implementation of procedures to protect people and resolve the emergency, including evacuation 13(1). Section 9(1) of the *Emergency Program Act,* permits the Solicitor General to declare a provincial state of emergency. Under a provincial declaration, the Solicitor General has the authority to order an evacuation as deemed necessary.
RMOW Emergency Measures Bylaw No.1593, 2002	Section 5.1 of the RMOW *Emergency Measures Bylaw* states that Council, by bylaw or resolution, or the Mayor by order, may declare a State of Local Emergency to effectively deal with an emergency or disaster in any part of the Municipality. This then allows implementation of procedures to prevent, respond to or alleviate the effects of an emergency or a disaster including causing the evacuation of persons, animals, and personal property from any part of the municipality that is or may be affected by an emergency or a disaster.
RMOW Fire Protection and Fireworks Bylaw No. 2046, 2014	The RMOW *Fire Protection and Fireworks Bylaw* allows the Fire Chief (or any person duly authorized by the Fire Chief to exercise any of the Fire Chief's powers) to enforce the *Fire Code, the Fire Protection and Fireworks Bylaw,* and any other bylaws, rules, orders and regulations of the Municipality for the prevention and suppression of fire and the protection of life and property; and to exercise the powers of the Fire Commissioner under section 25(1) to (4) of the *Fire Services Act*, including evacuation of a building or area due to threat from fire or explosion.
Criminal Code of Canada	The *Criminal Code of Canada* authorizes the RCMP to evacuate buildings or areas for criminal investigations or activities (i.e. bomb threats, hostage taking, drug laboratory, etc.). The RCMP have the authority to arrest and charge individuals who are obstructing the evacuation process or hindering emergency responder's in the performance of their duties.

Environmental Management Act	Section 80 (2.1 c) of the *Environmental Management Act* enables an officer (usually a Conservation Officer) to take whatever action is necessary to address a spill that has occurred that may pose a hazard to health or the environment including evacuate persons.
Fire Services Act	Section 25 (1) of the *Fire Services Act* enables the Fire Commissioner to evacuate a building or area due to threat from fire or explosion.
Forest Practices Code of British Columbia Act	Section 85 (1) of the *Forest Practices Code of British Columbia Act* enables a designated forest official to, by order, require a person to leave an area specified in the order if the government is engaged in fire control or suppression operations.
Highway Act	Section 23 of the *Highway Act*, allows the Minister of Transportation to close highways for the protection of persons using the highway, or to enable permitted traffic to be handled safely and expeditiously.
Petroleum and Natural Gas Act	When the [Oil and Gas] commission believes that, because of hazardous conditions in a field or at a well, it is necessary or expedient to close an area and to shut out all persons except those specifically authorized, the commission may make an order in writing setting out and delimiting the closed area.
Public Health Act	Section 63 (161) of the *Public Health Act* allows Minister of Health or any medical health officer to order a person, or persons, to remain in a specified place, or not enter a place, to prevent the transmission of an infectious agent or a hazardous agent (i.e. epidemics, pandemics).
Wildfire Act	Section 11 of the *Wildfire Act* enables the Minister of Forests, Lands, and Natural Resource Operations to designate, by order, a specified area as a restricted area for a specified period if the minister considers it necessary or desirable to limit the risk of a fire, to address a public safety concern or to avoid interference with fire control.
Workers Compensation Act	Under the *Workers Compensation Act,* WorkSafeBC can evacuate a workplace, and isolate it with fences, barricades, etc., if it reasonably believes that an immediate danger of serious injury, illness or death exists.

[1.] *In the Environmental Management Act an officer means a person or class of persons employed by the government, a government corporation or a municipality and designated in writing by a director as an officer or a conservation officer. A director means a person employed by the government and designated in writing by the minister as a director of waste management or as an acting, deputy or assistant director of waste management.*

Types of Evacuation

There are two types of evacuations: advance notice evacuations and no-notice evacuations. An advance notice evacuation is implemented when the municipality is given enough warning of the threat to carry out an organized evacuation. Generally, the municipality requires 18 to 24 hours of lead time to effectively organize an advance notice evacuation depending on the populations at the time of the evacuation. In situations where an emergency evolves rapidly, and there is not enough notice to effectively organize an evacuation, a no-notice evacuation is ordered. No-notice evacuations are carried out on a spontaneous or ad hoc basis, usually by the first response agency with lead jurisdiction over the incident. For no-notice evacuations the threat is imminent, or the emergency has already occurred, and the area is hazardous. No-notice evacuations are generally more chaotic, because there is no readiness phase to coordinate a phased evacuation or pre-position resources. Factors such as magnitude, intensity, spread of onset and duration of the emergency will determine the type of evacuation required.

An alternative to evacuation to protect people from adverse weather or outdoor conditions (e.g. poor air quality) is to shelter in place, in which people take immediate shelter in a building and take steps to prevent outside air from coming in to protect people from adverse weather or outdoor conditions. Shelter in place is typically a no-notice measure, because if there is advanced warning, an advance notice evacuation is usually implemented to remove people from the threat area. While shelter in place is a viable protective measure in many cases, it is outside the scope of this document.

Three Stages of Evacuation in British Columbia

In BC a three-stage evacuation process is used for evacuations and includes evacuation alert, evacuation order and evacuation rescind (or evacuation lifted).

STAGE 1 EVACUATION ALERT

An evacuation alert is the phase during which the public is warned of a threat. An evacuation alert does not require a declaration of a state of local emergency, as an alert is just a warning. An alert is issued, when municipal officials and emergency response agencies believe that it is highly likely that the threat will evolve and put people in the area at risk, but has not yet reached a threshold to pose immediate danger. At the evacuation alert phase people are advised of the potential need for evacuation. The alert highlights the nature of the danger and that evacuation may be required at any time. Information will be provided at that time on where to go, if the evacuation is ordered. When an evacuation alert is issued, people should prepare to evacuate and gather personal supplies required for several days.

If time and resources allow, evacuation alerts are issued by the municipality by door-to-door notification. Public information notifying people of an evacuation alert will also be posted on the municipal website, social media, and local radio and television stations.

It is common that when an evacuation alert is issued some people voluntarily self-evacuate. While this is completely acceptable, it must be made clear to those evacuating that Emergency Social Services support will not be provided, unless an evacuation order is issued.

It is not mandatory that an evacuation alert be issued before an evacuation order is issued. In quickly unfolding emergencies an evacuation order may be issued without a prior alert. For no-notice evacuations, an evacuation alert is generally not issued. It is also possible that people closest to the hazard are under evacuation order and those further from the hazard are under evacuation alert.

During the evacuation alert phase, the municipality will be focused on readying for an evacuation including monitoring the threat, preparing evacuation plans, providing information and updates to the public, and pre-positioning resources in the event that an evacuation order is required. A detailed checklist of recommended municipal readiness activities is included in the Operational Evacuation Plan. An evacuation alert template is included in the Operational Evacuation Plan.

STAGE 2 EVACUATION ORDER

When an evacuation order is issued, people in the threatened area are ordered to immediately evacuate. An evacuation order is a formal written order, issued under a declaration of local emergency, and signed by the Mayor informing all people in the threatened area that they must evacuate. The evacuation order must be in a consistent form with no allowance for discretion clearly indicating immediate evacuation.

A declaration of a state of local emergency must be declared for an evacuation order to be valid. Boundaries of the declaration of a state of local emergency must cover all areas under evacuation. See the Operational Evacuation Plan for a Declaring a State of Local Emergency flowchart and evacuation order template.

STAGE 3 EVACUATION LIFTED

When the threat or emergency, which necessitated the evacuation, is under control and the threatened area or emergency site is declared safe, the evacuation alert or order can be lifted. In many situations the population is advised that although they are being allowed to return to their homes, the threat may reoccur and an evacuation alert or order may be reinstated. Should a second evacuation of the same area be required, the process recommences from Stage 1 (evacuation alert) or Stage 2 (evacuation order), depending on the situation. In cases in which an evacuation alert is still in effect when an evacuation order has been lifted, the same notice may be used for the evacuation order lifted notice and evacuation alert.

If an evacuation alert or order can be lifted for only a portion of the area under evacuation, it is recommended that the original evacuation order be lifted, and a new evacuation order be issued with the new boundaries.

All evacuation alerts and orders must be formally lifted. When the evacuation order is lifted, allowing the public back into evacuated areas requires planning for an orderly re-entry.

Evacuation Process

While all evacuations are unique, there is a general process to evacuate a community. Depending on the evacuation scenario, some steps may be omitted, or may occur in a different sequence. Functional checklists to support the evacuation process are included in the Operational Evacuation Plan. The general process for evacuation includes:

Detection of hazard/ threat and incident assessment	Notification to CAO/EOC Director	Decision to evacuate	Determination of Evacuation Timeline	Declaration of Local State of Emergency
1 →	**2** →	**3** →	**4** →	**5** ↓
9 ←	**8** ←	**7** ←	**6** ←	**6**
Evacuation operations (includes shelter)	Preparation to move	Public notification	Inter-organizational notification	
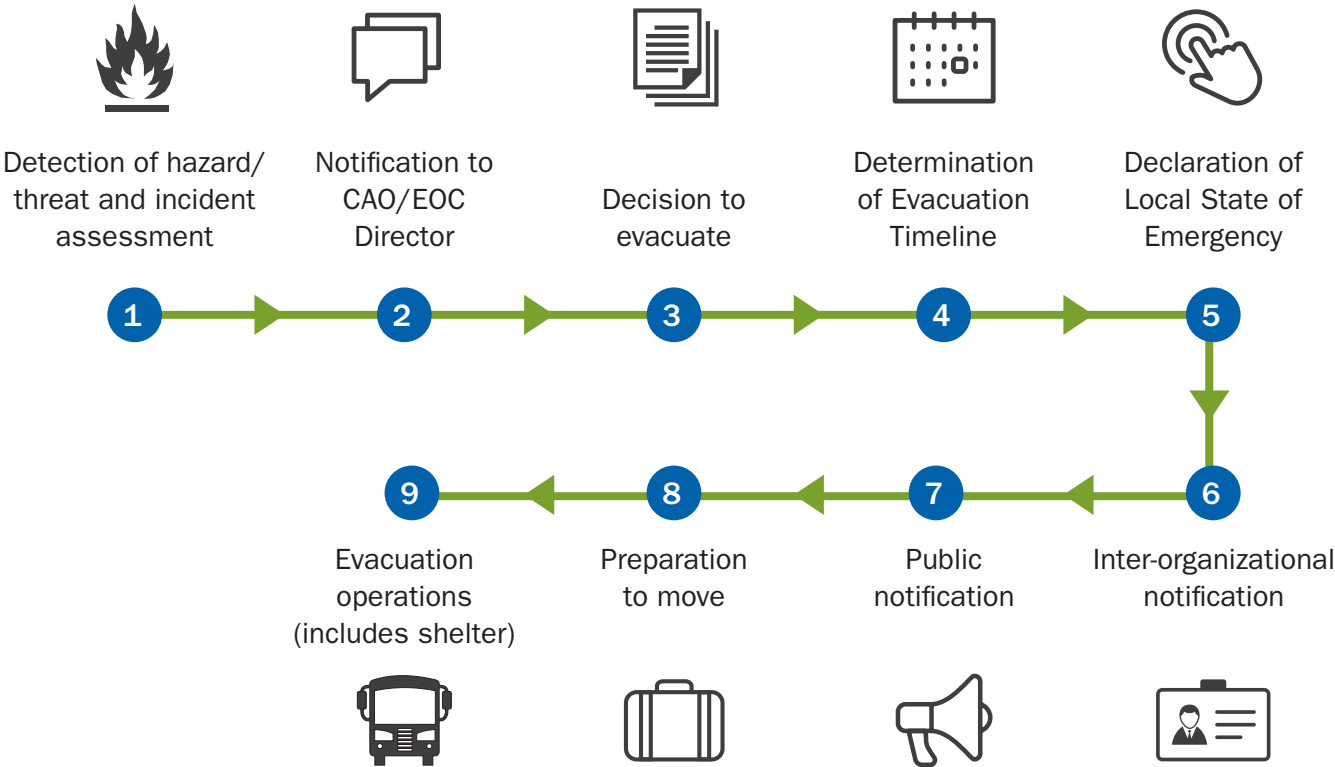
DETECTION OF HAZARD/THREAT AND INCIDENT ASSESSMENT

The initial stage of an evacuation is the confirmation of the incident. Incidents may be detected by an alarm or early warning system or reported by a 911 call from a member of the public or third party. In most scenarios the first response agency with jurisdictional authority of the incident will respond to the incident site and establish an Incident Command Post (ICP), the physical location of the tactical-level, on-scene incident command and management organization. The Incident Commander (IC), the first responder responsible for overall management of the incident, will confirm the location, assess the incident, determine the magnitude (or the potential magnitude), the number of people at risk, notify additional first response agencies required at the site, and take any immediate measures required to protect life and property. In life-threatening situations, the IC may execute a no-notice evacuation to clear people immediately from the risk area or people may have already fled the area.

CAO/EOC DIRECTOR NOTIFICATION

Once a hazard is judged to be a significant threat to the public, the IC will alert others of the incident. This step involves notification to the CAO/EOC Director (or delegate). Consistent with current practice, RMOW and DOS staff are required to promptly inform the Chief Administrative Officer (EOC Director) when a major emergency event occurs or may occur that could endanger lives or have a significant adverse impact on the community, or a portion of the community. It is imperative that information reaches the right person in a timely manner. If the CAO/EOC Director is not informed or cannot be reached and no one takes charge, decisions may be delayed or overlooked.

In most cases the initial notification will include a recommendation for protective measures. A Situational Awareness & Threat Information Form has been developed as a tool for gathering the necessary information (see below).

Situational Awareness & Threat Information		
Date:	Time:	
Source of Information:	Agency:	
Cell Phone #:	Radio Channel	

Incident/Threat Information		
Type of Threat/Incident		
Location		
Incident Command Post Established?	Yes ☐ No ☐	Location of ICP:
Summary of Threat/Incident?		
Who is Responding?		

Protective Actions				
Is a protective action recommended to protect the public?	Yes ☐	Evacuation Alert ☐	Shelter in Place ☐	
		Evacuation Order ☐	Unkonwn ☐	
	No ☐			
If yes, describe the evacuation area (zones and geographic boundaries)				

DECISION TO EVACUATE

In most cases the IC will determine the most appropriate protective measure and put the recommendation forward to the CAO/EOC Director (or delegate) at the time of initial notification. The chart below lists the hazards that could cause a mass evacuation in RMOW and DOS, and identifies for each scenario who the IC (Lead Agency) is likely to be.

WHISTLER		
Event Type	**Lead Agency**	**Agency Likely to Recommend an Evacuation Order to EOC Director**
Natural Hazards		
Air Quality (wildfire smoke)	Vancouver Coastal Health Medical Health Officer	Vancouver Coastal Health Medical Health Officer in discussion with the RMOW EOC Director.
Interface Fire	BC Wildfire Service in discussion with WFRS	BC Wildfire Service in discussion with Whistler Fire Rescue Fire Chief and RMOW EOC Director.
Volcanic Eruption - Garibaldi Volcanic Belt	Natural Resource Canada facilitated through EMBC	Natural Resource Canada would be subject matter expert with their recommendations to communities being facilitated through EMBC.
Earthquake	Depends, see right column	The lead agency in an earthquake will depend on the trigger for considering an Evacuation Alert or Order. If the trigger is public safety as a result of fires, the recommendation may come from WFRS. If the trigger is unsafe buildings, the RMOW may make the determination with the assistance if rapid damage assessment personnel, structural engineers, and EMBC.
Human-Caused		
Hazardous Substance Spill or Explosion	Whistler Fire Rescue Service	Whistler Fire Rescue Service in communication with Transport Canada CANUTEC (technical expertise).
Terrorist assaults using chemical, biological, radiological, or nuclear agents	RCMP	RCMP
Terrorist assaults using explosives, firearms, or conventional weapons	RCMP	RCMP

SQUAMISH		
Event Type	**Lead Agency**	**Agency Likely to Recommend an Evacuation Order to EOC Director**
Natural Hazards		
Flood- moderate to major	DOS (Public Works Department)	DOS EOC Director in communication with Public Works staff, EMBC, and following notifications issued by the River Forecast Centre or BC Hydro (for the Cheakamus Dam only)
Debris flow	Depends, see right column	The lead agency in a debris flow will depend on the trigger for considering an Evacuation Alert or Order. Natural Resources Canada and FLNRORD via EMBC may be able to provide some notice in advance although it is unlikely an evacuation could take place before impact. If the trigger is unsafe buildings or impeded access routes, the DOS may make the determination with the assistance of rapid damage assessment personnel, structural engineers, and EMBC.
Dam failure	BC Hydro and FLNRORD	BC Hydro would send an alert to the DOS regarding risk of a dam failure; DOS EOC Director may also receive guidance from FLNRORD.
Barrier collapse	Natural Resources Canada facilitated through EMBC	Natural Resources Canada would be subject matter expert with their recommendations to communities being facilitated through EMBC
Interface fire	BC Wildfire Service in discussion with SFRS	BC Wildfire Service in discussion with Squamish Fire Rescue Service Fire Chief and DOS EOC Director
Volcanic eruption – Garibaldi Volcanic Belt	Natural Resources Canada facilitated through EMBC	Natural Resources Canada would be subject matter expert with their recommendations to communities being facilitated through EMBC
Earthquake	Depends, see right column	The lead agency in an earthquake will depend on the trigger for considering an Evacuation Alert or Order. If the trigger is public safety as a result of fires, the recommendation may come from SFRS. If the trigger is unsafe buildings, the DOS may make the determination with the assistance of rapid damage assessment personnel, structural engineers, and EMBC.
Loss of Essential Services or Critical Infrastructure	Utility providers facilitated through EMBC	The utility provider in consultation with EMBC and the EOC Director
Human-Caused		
Hazardous Substance Spill or Explosion	Squamish Fire Rescue Service	Squamish Fire Rescue Service in communication with Transport Canada CANUTEC (technical expertise)
Terrorist assaults (including the use of conventional weapons, as well as chemical, biological, radiological, or nuclear agents)	RCMP	RCMP

In some situations the IC will not provide a protective measure recommendation and will defer the decision to the CAO/EOC Director. While Council, and specifically the Mayor, have the legislative authority to issue an evacuation order, it is usually expected that the CAO/EOC Director will put forward a recommendation to Council.

Evacuation Group

It is likely the CAO/EOC Director will want to consult with specific staff to help determine an appropriate protective measure.

The RMOW Evacuation Group includes:

- Chief Administrative Officer
- GM of Corporate and Community Services (RMOW)
- Fire Chief
- RCMP Staff Sergeant
- Emergency Program Coordinator

The DOS Evacuation Group includes:

- Chief Administrative Officer
- Senior Director Community Services
- GM of Corporate Services
- Fire Chief
- RCMP Staff Sergeant
- Emergency Program Coordinator

The Evacuation Groups for RMOW/DOS have been set-up in Connect Rocket to facilitate prompt notification; details can be found in the Operational Evacuation Plan. In some scenarios, the Evacuation Group may not have the technical expertise to determine the most appropriate protective measure and may need to consult a technical specialist. Technical specialists can be arranged through EMBC or via private local contractors.

PROTECTIVE MEASURES

The CAO/EOC Director (or delegate), in consultation with the Evacuation Group, must choose a course of action to protect the public. Complex issues need to be considered in making this decision, often with only limited information and time available. There are five protective measures available to decision-makers which include:

Monitor & Re-assess – Scenario does not pose an immediate threat, but has the potential to escalate. The emergency is closely observed and the risk re-assessed at consistent intervals determined by the IC or CAO/EOC Director. Since emergencies can evolve and change quickly, advanced planning should begin for any incident that may require a mass evacuation.

No-notice Evacuation – Immediate evacuation by the IC of the area at risk. No-notice evacuations are implemented when there is no time to coordinate a planned evacuation because the emergency is imminent or has already occurred.

Evacuation Alert – Alert is issued to warn the public of a potential threat and advises that they may be told to evacuate at a moment's notice and should prepare to evacuate.

Evacuation Order – Order notifies the public that they are legally required to immediately evacuate the area under Order.

Shelter in Place Order - Shelter-in-place is an alternative protective measure to evacuation where people are asked to stay inside and close windows and doors. Shelter-in-place may be used as a protective measure during a hazardous materials release, severe weather event or a threat of criminal violence

At any time, the IC has the authority to issue a no-notice evacuation, if people are at immediate risk.

Threat Assessment

In simple terms, issuing an evacuation order, ultimately, comes down to deciding whether people are more risk staying in a potentially unsafe area, than moving out of or through it. If time allows, a threat assessment is completed by the Evacuation Group that considers the following:

- probability of serious harm (both physical and psychological) to people within the geographic area if threat/incident occurs and they remain
- amount of time until the threat impacts the neighborhood/community
- population size and density of the threat/incident area
- potential for impact sooner and/or more severely than anticipated
- potential to cut-off Highway 99 to the North or South the size of the area to be evacuated
- probability that hazardous conditions will be present for an extended period of time

The degree of confidence will vary according to the quality and relevance of information available, the agreement of agencies consulted, and the time available to make a decision.

Decision Making Aids

To aid in decision-making, a Protective Actions Decision Tree and Protective Measures Threat Assessment have been designed to assist the Evacuation Group in analyzing the emergency situation to help determine if a Tactical Evacuation, Evacuation Alert, or Evacuation Order is required or if no action is required and the situation should continue to be monitored.

Protective Actions Decision Tree

The Protective Measures Decision Tree poses a series of yes/no questions to the decision-maker. Answers to these questions lead to a path through the tree to an ending outcome. The protective action decision trees discussed here have six potential outcomes:

1. Issue a No-notice Evacuation
2. Issue an Evacuation Alert
3. Issue an Evacuation Order
4. Issue a Shelter-In-Place Order
5. Monitor and Re-Assess
6. Conduct a detailed analysis with a technical specialist

The last outcome is necessary because, under certain conditions, yes/no questions cannot lead to the identification of a preferable option.

Protective Actions Threat Assessment

The Protective Measures Threat Assessment is designed to assist the Evacuation Group in analyzing the emergency situation to help determine if a Tactical Evacuation, Evacuation Alert, or Evacuation Order is required or if no action is required and the situation should continue to be monitored.

The threat assessment compels the decision maker to rank the probability of several factors that influence the need for evacuation from low to very high. The decision-maker then totals the potential severity and impacts to make a determination.

Protective Action Decision Tree

Event occurs or is imminent

Is there an immediate threat to life safety?

Is this a hazardous material spill or release?
— NO
— YES

Is the spill/release imminent (within 2 hrs) or has it already occurred?

Is this a hazardous material spill or release?
— YES
— NO

Assess Severity

Define geographical area of threat

Can people evacuate without exposure to high levels of chemical exposure or serious life safety hazards?
— YES
— NO

Can people shelter in Place without exposure to high levels of chemical exposure or serious life safety hazards?
— YES
— NO

Is exposure anticipated to be less than 4 hours?
— YES → SHELTER IN PLACE
— NO

Contact Scientific Advisor at CANUTEC [613-996-6666 or *666 on cell] or Ministry of Environment [1-800-663-3456] to seek advice on best course of action to reduce harm to people and responders.

Is there time to Is the threat expected to occur and endanger people in the next 24-72 hours? an Evacuation Order before the hazardous plume arrives?
— NO → NO-NOTICE EVACUATION
— YES → EVACUATION ORDER

Is there a time to issue an Evacuation Order and clear the evacuation area before the threat endangers people?
— YES
— NO

Is the threat expected to occur and endanger people in the next 24 hours?
— NO
— YES

Is the threat expected to occur and endanger people in the next 24-72 hours?
— NO → WAIT & RE-ASSESS
— YES → EVACUATION ALERT

EVACUATION ORDER

Protective Actions Threat Assessment

Possible Effects	Low	Medium	High	Very High
Probability of serious harm (both physical and psychological) to people within the geographic area if threat/incident occurs and they remain				
Amount of time until threat impacts the neighborhood/community	5+days	3-5 days	<72 hours	<24 hours
Population size and density of the threat/ incident area	Partial neighborhood < 50 homes	Low density neighborhood (ex. Emerald Estates)	Dense neighborhood or neighborhoods (ex. Whistler Village)	Mass evacuation of community
Potential for impact sooner than anticipated, and/or more severely than anticipated				
Potential to cut-off Highway 99 to the North or South				
Probability that hazardous conditions will be present for an extended period of time				

Overall Ranking – rank the overall event:

TOTAL

Low = Hazard/threat requires monitoring. Protective actions in the immediate vicinity of the hazard/threat may be required.

Medium = Hazard/threat poses a risk to a localized area of the community that could affect health and safety. Protective actions may be implemented in localized area.

High = The hazard/threat is placing people at risk. Protective actions, including an Evacuation Alert or Order is likely necessary.

Very High = The hazard/threat is placing people at very risk. Protective actions, including a No-Notice Evacuation or Evacuation Order is likely necessary.

DETERMINE EVACUATION TIMELINE

Once it is determined that an Evacuation Alert or Order is required the timing for issuing the Alert or Order should be established. The amount of time available before a hazard strikes will determine whether an immediate evacuation is required or if a phased evacuation is a more suitable option. The exact nature of the timeline will vary based on the speed and intensity of the hazard, the current population, the times of day involved, and the scale of the evacuation. To determine the timeline for evacuation, decision-makers must determine the projected arrival of the threat and the estimated clearance time of the community.

Projected Arrival of the Threat

The projected arrival of the hazard or threat is an estimate of how long until the "hazard" materializes. This may have been provided to the CAO/EOC Director at the time of the initial report from the IC or may have to be estimated by the Evacuation Group. The Evacuation Group may have to evaluate weather forecasts or confer with a technical specialist. In a wildfire scenario, BCWS would typically provide a projected arrival of the threat and a recommendation on when an alert or order should be issued. For flooding, the local government may have to assess river levels and forecasts and advise with the River Forecast Centre to develop an estimate of when flood waters are projected to overtop the riverbank.

Estimated Clearance Time

The estimated clearance time is the approximate total time required to move all evacuees through the road network—the length of time between the first and the last car leaving the area. Clearance times do not reflect how long it takes for an individual vehicle to go from a residence to any specific destination. Knowing the local governments approximate clearance time allows decision makers to issue an evacuation order early enough to be organized and effective but not so early that the hazard is unlikely to materialize. To estimate the clearance time you must estimate:

- the number of evacuees
- the number of vehicles that will use the highway
- the number of people that require transit
- the potential number of people who may need specialized transportation

The Operational Evacuation Plan includes seasonal templates to estimate the total number of evacuees, the number of vehicles, the number of people that may require transit, the number of people that may require group lodging, and the number of people that may require assistance to evacuate using the current RMOW occupancy rate. There are two options for templates – a summer and a winter.

Formula to Determine Evacuation Clearance Time

A formula has been develop to estimate of how long it will take to evacuate the community using the information gathered above. Please note that this is an estimate and a buffer for error must be included.

Formula:

[Total # of Vehicles (Vehicles + Buses) x 90% (the percentage expected to go South)]/the # of vehicles per hour the highway can accommodate (1 outbound lane = 1650; 2 outbound lanes = 1850).

Evacuation Timeline

Once the estimated evacuation clearance time is calculated, an evacuation timeline can be established. The evacuation timeline is developed by working backwards from when the hazard is likely to impact.

Sample evacuation timeline for a peak-season evacuation.
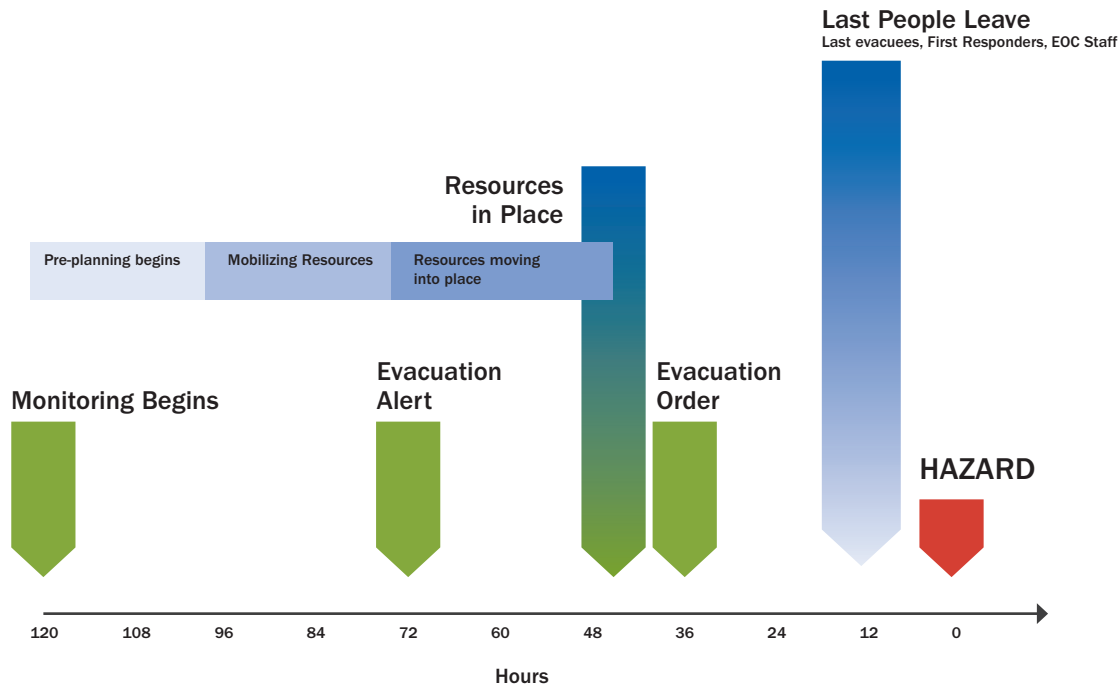
It is important to note that when establishing a timeline for an Evacuation Alert or Order there are some additional considerations. These include:

- the time required to acquire the resources needed to implement the plan
- the calculations in this guide provide estimates, a buffer of time for error should be considered
- it takes people at least 2-3 hours to ready themselves to evacuate after a definitive Evacuation Order is issued if they have been on Alert, and longer if they have not
- ideally, people are on Evacuation Alert for at least 24 hours (48 is preferred) before an Evacuation Order is issued so they can prepare to go, coordinate family, and organize transportation. And after that, evacuees may need many hours of daylight to travel before the threat arrives
- time of day. If possible, evacuation orders should be issued as early in the day as possible so people are not travelling at night

PROCEDURES FOR MONITORING THE SITUATION OR ISSUING AN EVACUATION ALERT OR ORDER

Monitoring the Situation (Includes Pre-Planning)

Some hazards may be detected early and won't pose an immediate threat to the RMOW or DOS and won't require an Evacuation Alert or Order. However, these hazards may have may have potential to escalate or spread and should be closely monitored and in some cases contingency planning for an evacuation alert or order should begin.

The IC or CAO/EOC Director will determine if, and how much, monitoring of the situation is needed. Monitoring may include tracking weather forecasts, daily check-ins with a lead external agency, monitoring air quality reports, or many others.

Determining Evacuation Trigger Points

As part of hazard monitoring, evacuation trigger points should be established. Evacuation trigger points are a point on the landscape (or threshold), which once crossed by a hazard, triggers officials to issue an evacuation alert or order. In a flood scenario, this may be defined as waters reaching flood stage elevations. In a wildfire scenario, this may be the fire reaching a point on the landscape.

Depending on the type of hazard evacuation trigger points will be determined by the RMOW or DOS (as is typically the case for a flood scenario) or provided to the RMOW or DOS (as is typically the case for a wildfire scenario). If the hazard is an RMOW or DOS lead, the CAO/EOC Director, in consultation with the Evacuation Group, should determine evacuation trigger points; or request that a technical specialists develop trigger points.

The Operational Evacuation Plan includes a checklist of potential activities during the monitoring phase.

DECLARATION OF LOCAL STATE OF EMERGENCY

If an Evacuation Order is required, the local government will need to declare a local state of emergency to access the powers of the Emergency Program Act; this is outlined in more detail in the section **Authority to Order an Evacuation.** An Evacuation Alert does not require the local government to declare a local state of emergency.

The CAO/EOC Director will oversee the process of preparing the documentation required to declare a local state of emergency and is responsible for briefing Mayor and Council and for attaining the appropriate approval and signature from the Mayor.

The following information must be included on the local declaration:

- the nature of the emergency
- the geographic boundaries (preferably shown on an attached map) within which the declaration will apply
- the date of the local declaration; and
- the signature of the head of the local authority.

A local declaration template is provided in the Operational Evacuation Plan.

> **Note: It is important not delay the evacuation to get the paperwork complete. If needed, verbal approval from Mayor and Council can be used to initiate an evacuation, and paperwork can be completed as soon as possible. The Operational Evacuation Plan details the procedure to initiate a conference call with Mayor and Council.**

There are several other legislative measures available to order an evacuation in BC; these vary depending on the

type of threat and the amount of time before the emergency occurs. These are listed in the section **Authority to Order an Evacuation** and in the Operational Evacuation Plan.

Immediately after making a declaration of a state of local emergency, the RMOW or DOS must:

- Send a copy of the signed local declaration and the delegation matrix to the PREOC which will ensure the Minister is informed, as required by legislation

- Immediately publish notice of the Declaration of Local Emergency to the affected population and media (it is strongly recommended that accompanying maps are included in the publication)

- As soon as practical after making a declaration the Mayor must convene a meeting of Council to assist in directing the response to an emergency

INTER-ORGANIZATIONAL NOTIFICATION

Once the decision to evacuate has been made and the timeline established there are various departments and agencies that will need to be notified. Who needs to be notified will depend on the hazard and location. These may include, but are not limited to:

- **Senior Management Team**
- **Council**
- **External agencies:**
    - BC Wildfire Service
    - BC Emergency Health Services (Ambulance)
    - Blackcomb Helicopters
    - Ministry of Transportation and Infrastructure
    - School District #48
    - Whistler Blackcomb
    - Whistler Health Care Centre
    - Squamish General Hospital
    - Whistler Search and Rescue
    - Squamish Search and Rescue
    - Whistler Transit Ltd.
    - Squamish Transit Ltd.
    - Emergency Management BC
- **Neighboring communities:**
    - Resort Municipality of Whistler/District of Squamish (as applicable, depending who is ordering the evacuation)
    - Squamish Lillooet Regional District
    - Village of Pemberton
    - Lillooet
    - Lil'wat Nation
    - Squamish Nation
    - Canadian Red Cross

These groups have been set-up in Connect Rocket to facilitate prompt notification; details can be found in the Operational Evacuation Plan.

NOTIFICATION TO PUBLIC – EVACUATION WARNING

If an evacuation alert or order is required, officials must inform the public to evacuate and provide them with the details about the evacuation. Information will be shared using a range of warning methods, including municipal websites and social media, and broadcast media like television and radio. If time allows, officials will perform door-to-door notifications.

The purpose of a warning in the context of an evacuation is to provide:

1. Information about the nature and timing of impact to those likely to be affected by the event;

2. Specific directions about the evacuation, including who it applies to and why; when people should evacuate; where and when they should go, and how to get there; and

3. Information about potential consequences of not evacuating and protective measures to take if not evacuating.

Warning people of an evacuation is very important, and a section of this document is dedicated specifically to **Public Information.**

PREPARATION TO MOVE

Once the decision to issue an evacuation order has been confirmed and the timeline has been established, the evacuation plan must be confirmed and implemented by the local authority. Details of the specific evacuation scenario will be confirmed, including viable transportation modes, evacuation phasing, selection and confirmation of receiving communities, and location of shelters. Staff and resources will be confirmed and deployed to implement evacuation strategies and en route services. Receiving communities will be contacted and confirmed.

EVACUATION OPERATIONS

Following the decision and warning to evacuate comes the movement phase, which is also known as the withdrawal phase. This is the organized movement of people from the evacuation area to a safe area. Of particular concern during this phase are the control of traffic flow, evacuation routes, safety of evacuees, and access to and security of the evacuation zone.

RECEPTION AND SUPPORT

Once people are moved, people who don't have family or friends, who can receive them must be provided with shelter. In a mass evacuation, people will need to be provided with shelter in another community or several other communities outside of the hazard area. Shelters will be selected based on capacity, availability, traffic considerations, and other factors. The local government should have local liaisons at each shelter to share information and updates.

Receiving and sheltering people in an evacuation is critically important, and is a requirement of the *Emergency Program Act*. There is section of this document dedicated specifically to **Mass Shelter.**

Concept of Operations

Framework and Principles

In planning for any mass evacuation operations in the Sea to Sky Corridor, a common organizational framework that clarifies stakeholder roles, coordination processes, and common actions or considerations in various operational phases is essential. This evacuation Concept of Operations (CONOPS) is based on the BC Emergency Management System (BCEMS) which is used by emergency management officials across the province at every level to guide multi-functional responses to disasters and emergencies.

This CONOPS aims to aid evacuation planners in planning and coordinating all evacuation operations with multiple stakeholders at various levels and jurisdictions. This section provides an overview of the common framework and guiding principles that will be used during a mass evacuation scenario in the Sea to Sky Corridor, including BCEMS, Incident Command System (ICS), Unified Command (UC), the Common Operating Picture and the EOC Action Plan, inter-agency communications and standard operating procedures. An overview of the coordination and management of an evacuation is also provided. The specific roles and responsibilities of each agency involved in evacuation are covered in the **Roles and Responsibilities of Agencies** section.

Key planning questions that guided this section include:

- What is the common organizational framework for a mass evacuation?
- How will agencies communicate?
- When an evacuation is implemented how do we ensure the information is clear and coordinated between agencies?
- How will we ensure a common operating picture with so many agencies involved in the implementation of the Evacuation Plan?

BCEMS

BCEMS provides emergency management officials with a common response management model based on the Incident Command System (ICS). This flexible, standardized system, a common approach, and shared understanding of functions and procedures enable stakeholders to work together more effectively. In addition, BCEMS is applicable to any incident, regardless of the scope, scale or complexity. BCEMS allows for the integration of response structures and practices into a unified incident management system that is applicable to all levels of government, business and industry, and not-for-profit organizations. A large-scale evacuation of a community entails the engagement and participation of a wide range of stakeholders (see **Roles and Responsibilities of Agencies** section), and coordination among them allows for effective response during an emergency or disaster. Coordination protocols, close working relationships and open lines of communication among response organizations facilitate integrated response. Those who lead response efforts seek to align the capabilities of various stakeholders to reduce the risk of any group being overwhelmed by the crisis.

Under a coordinated system, most groups and agencies are able to perform one or more of the following roles:

- Coordinating and integrating action: Setting priorities for their respective operations and resources and developing strategies for resolving challenges that arise in a multi-agency response situation;

- Sharing information: Providing observations on the disaster and its effects on the community or organization, and facilitating communication;

- Exchanging resources: Offering resources for the use of others under formal or informal arrangements.

During the planning and implementation of a mass evacuation, the response goals of BCEMS will be adhered to when decision makers at every level are prioritizing actions. The response goals are as follows, in order of priority from highest to lowest:

1. Ensure the health and safety of responders
2. Save lives
3. Reduce suffering
4. Protect public health
5. Protect infrastructure
6. Protect property
7. Protect the environment
8. Reduce economic and social losses.

These goals can be interpreted in different ways based on the operational requirements of an evacuation situation.

INCIDENT COMMAND SYSTEM (ICS)

For site level emergency response, including evacuation processes, one of the most important best practices that has been incorporated into the mass evacuation plan is ICS. ICS is a standard, on-scene, all-hazards incident management system that is the standard for firefighters, law enforcement, rescuers and emergency medical teams. ICS has been established by the Government of British Columbia under BCEMS as the standardized incident organizational structure for the management of all incidents. ICS is based on proven management tools that contribute to the strength and efficiency of the overall system. The following ICS principles form the basis by which the ICS system ensures effective incident management:

- Common terminology
- Establishment and transfer of command
- Chain of command and unity of command
- Unified command
- Management by objectives
- Reliance on an incident action plan
- Modular organization

- Manageable span of control
- Comprehensive resource management
- Incident locations and facilities
- Integrated communications
- Information and intelligence management
- Dispatch and deployment of resources

ICS is a management system for command, control and coordination of a response, and provides a means to coordinate the efforts of individual agencies. The ICS lends itself to uniformity of command, which is essential to the successful management of an incident. When responders work together managing an incident, there must be a clear understanding of information and immediate knowledge of the chain-of-command. ICS provides this uniformity of terminology and organizational structure. If all agencies involved in an incident are using similar organizational structures and procedures, operations will be consistent and resilient to confusion. In essence, many groups can function as one organization and be managed as such by an Incident Commander (IC) or Unified Command (UC).

One of the most important features of ICS is to the development of solid working relationships among all personnel involved in the management of the incident. Ideally, incident responders should endeavour to know each other and the capabilities of each organization. This supports and fosters mutual trust and confidence in each other's ability to perform under very stressful conditions.

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                    COMMAND/MANAGEMENT
          ┌──────────────┬──────────────┬──────────────┐
      OPERATIONS      PLANNING       LOGISTICS       FINANCE
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UNIFIED COMMAND

Unified Command (UC) is an important element of ICS that deals with multi-jurisdictional or multi-agency incident management. It provides a coordination protocol to enable two or more agencies with different legal, geographic and functional responsibilities to coordinate, plan and interact effectively. UC overcomes much of the inefficiency and duplication of effort that can occur when independent or separate agencies from different functional and geographic jurisdictions, or agencies at different levels of government. In a UC structure, the individuals designated by their jurisdictional authorities jointly determine objectives, plans and priorities, and work together to execute them as a cohesive unit.

Coordination and Management of Evacuation

The local authority has primary responsibility for the management of an emergency response within their jurisdiction, including evacuations, and will most likely be the authority to issue an evacuation order. Once a decision to evacuate has been made, the evacuation process is coordinated and managed by the local government that issued the evacuation order. The effective implementation of a mass evacuation in the Sea to Sky Corridor would span several levels: At the site level, where operations facilitating the evacuation are actively conducted; the site support level at the local government's EOC, which is responsible for coordinating with and supporting the evacuation; at a regional local government level with coordination directly between local government EOCs and officials; and at the provincial regional level, with the South West Provincial Regional Emergency Operations Centre (SWE PREOC). Support to the SWE PREOC may also be provided by the Provincial Emergency Coordination Centre (PECC) based in Victoria, which would also assist in bringing in federal assets (e.g. aircraft from the Canadian Armed Forces) if needed.

SITE - RMOW AND DOS

First responders at the site level are responsible for activating on the ground aspects of the evacuation plan, such as determining the geographical area that requires evacuation; delivering evacuation alerts or orders; implementing the transportation plan; and providing security within evacuated areas. First responders at the local site level will remain responsible for managing and conducting emergency operations working under UC and ICS. In addition to conducting planned evacuations in advance notice situations, there may be times when first responders will be responsible for initiating tactical evacuations in no-notice situations (in particular in the period prior to the establishment of the local government EOC).

SITE SUPPORT - RMOW AND DOS EMERGENCY OPERATIONS CENTRES (LOCAL GOVERNMENT)

Once the local government has made the decision to issue an evacuation order, or decides that an evacuation order may need to be issued, the local government EOC will be activated (if not already done). Local government EOCs are responsible for requesting resources and capabilities, conducting advanced planning, and sharing information to help with operations and contribute to the local and regional common operating picture. The local government EOC is organized according to the Incident Command System.

Ideally, all municipal departments and external agencies with staff responding on site will have representatives in the local government EOC. If a staff person is not available from a department or agency, a direct point of contact will be assigned in the EOC, so situational awareness is gathered, and information updates shared with the agency.

The Steering Committee will be notified as early as possible of an evacuation order or potential evacuation order, and will be asked to provide a representative to the local government EOC.

REGIONAL SUPPORT - (LOCAL GOVERNMENT TO LOCAL GOVERNMENT)

Direct coordination and communication with other local governments in the region will be essential to coordinate the movement and reception of evacuees. If EOCs are activated in each community, coordination and communications will take place between EOCs. If an EOC is only active in the affected community, it should communicate with the emergency program coordinators in other parts of the region, which may be affected by the evacuation.

PROVINCIAL REGIONAL SUPPORT - (PROVINCIAL REGIONAL EMERGENCY OPERATIONS CENTRE)

Local governments are further supported and may be coordinated by the PREOC, if requested and required. Coordination and support at the national level for evacuations will be provided when the provincial capability is overwhelmed and federal resources are required. This level will not be discussed in detail, as it is beyond the scope of local authorities and is the responsibility of the province.

COMMON OPERATING PICTURE AND THE EOC ACTION PLAN

The local government EOC is the location where the common operating picture is established. A common operating picture is a single display of relevant operational information and is critical to the coordination of an effective mass evacuation. The local government EOC that issues the evacuation order serves as the central information gathering and dissemination centre for the mass evacuation. The EOC is responsible for collecting, evaluating and sharing situation, response and resource information, and developing the EOC Action Plan.

The EOC Action Plan is a key document that articulates priorities, responsibilities, resource needs, and response actions for each operational period; all responding agencies work off one EOC Action Plan. The action planning process incorporates incident and response information from all jurisdictions and disciplines, and translates this information into a response strategy. The key to a successful action plan is obtaining input from all stakeholders, making informed decisions about priorities, and ensuring that the action plan is read and implemented.

In addition to the EOC Action Plan, a common operating picture ensures that public information is coordinated between the many responding agencies to ensure that the public is getting clear and consistent information.

JOB ACTION SHEETS

Agencies with a significant role, responsibility or resource in this plan will have a Job Action Sheet (JAS) for mass evacuations (where this plan will be activated). Once an emergency is known, each agency should refer to the specific JAS for their agencies. JASs describe specific activities that are required by each agency to make this plan work and to implement this plan to safely and effectively conduct a mass evacuation. As it is impossible to anticipate every scenario in a mass evacuation, JASs are guidelines, and agencies will need to remain up to date on information and flexible.

JASs containing detailed instructions for responsible agencies to accomplish the tasks assigned in the plan are included in the Operational Evacuation Plan.

Interagency Communications

Emergencies create a high level of uncertainty and a need for timely and accurate information sharing between organizations. The effective flow of information between departments and organizations is critical for a mass evacuation to be successful. During evacuations, when communications are inadequate, personnel and resources are inefficiently used and activities are duplicated. Effective, coordinated interagency communication is needed at all levels of the response and is described below.

SITE COMMUNICATIONS

At the site level, communication between agencies will most likely occur in person, or by cell phone or satellite phone, dispatch to dispatch, or radio.

RMOW and DOS Specific Site Communications

In both the RMOW and the DOS, an interagency radio channel has been established to allow agencies to communicate with each other during large emergency events. The interagency radio channel will be the primary means of communication between agencies in an emergency until a unified command post, where agency representatives are co-located and their operations are integrated, is established. The purpose of the interagency radio channel is to facilitate initial connections between agencies and to gain situational awareness. As the emergency event evolves, the interagency radio channel will be used to share information that is valuable to all agencies including safety updates, situational awareness updates, location of unified command post, etc. Superfluous radio transmissions are strongly discouraged on the interagency radio channel, and specific task or operational communications should be carried out on tactical channels.

Where advantageous, cell phones will be used to share information between agencies. Cell phones work well to share specific information that not all agencies need to hear. Cell phones do have the limitation of only being heard by the people on the phone.

When prompted, first responders can relay information through their respective dispatchers via dispatch to dispatch communications. Information, such as confirming an incident location, the estimated time of arrival to an incident site and radio channels, often go through dispatch.

See the Operational Evacuation Plan for specifics on site communications.

EOC Communications

As stated in previous sections, once the local government considers that an evacuation may be required or an evacuation order has been issued, the local government EOC will be activated by the EOC Director. The Liaison Officer of the EOC will notify the Evacuation Group, which includes all representatives on the Steering Committee, and provide the group with instructions on required actions from representatives of participating agencies at the site support level. Required actions may include an immediate request to join a conference call, a request to stand by for updates, instructions to report to the EOC, or requests from immediate required resources or actions to be taken by that organization. The Connect Rocket platform, an internal emergency communications system used by the RMOW and DOS, will be used initially to communicate between agencies until representatives are co-located in the EOC. For the specific platform and procedures used to notify the Evacuation Group see the Operational Evacuation Plan.

It is expected that the EOC will be staffed within 90 minutes of the initial callout. This could take longer depending on the event, the time of day, day of week, staff availability, and disruption to the transportation and communication systems in the region.

The Evacuation Group should be notified and be updated at the first sign of a potential evacuation, even if it is several days out. This is reflected in the Readiness Checklists of the Operational Evacuation Plan.

Provincial Support Communications

The local government EOC will be in regular communication by phone and email with EMBC at the Provincial Regional Emergency Operations Centre. If phone and email communications are down, amateur radio and satellite phones will be used. The local government EOC will provide regular situation updates, including the most current incident information, to the PREOC at regular intervals.

Moving Critical Staff

The movement of emergency personnel, resources, and impacted people during a disaster event is challenging, when there are significant negative impacts to transportation networks. In a mass evacuation scenario, the main routes will be congested with people trying to leave the area. It is essential that critical emergency staff and resources can still be transported to the right places, even in the middle of an evacuation. For the RMOW and DOS, this includes emergency responders, such as fire, ambulance and police, as well as transit staff to mobilize as many transit vehicles as possible to assist people who don't have their own vehicles. As mentioned in the previous sections, moving critical resources by air may be the fastest option and should be considered in a mass evacuation.

See the Operational Evacuation Plan for instructions on what critical staff should do, if they need to report to an area inside an evacuation order zone or if they do not have transportation.

BC Disaster Response Transportation System

The BC Disaster Response Transportation (DRT) system is a set of integrated, cross-jurisdictional and multimodal strategies and methods for the safe and coordinated movement of emergency resources. The DRT system is intended to enable different governments, agencies and stakeholders to align their disaster preparedness plans and activities, so they will be consistent across jurisdictions and transport modes.

The DRT system is scalable, and may not be necessary to use all parts of this system during a mass evacuation. The decision to apply any part of the system remains with the transportation or emergency response authority of the impacted or supporting jurisdiction.

Transportation nodes, including staging areas and transfer points, are essential elements of the DRT, which will be relevant during a mass evacuation scenario to bring in resources and transfer them to where they are needed.

STAGING AREAS

Staging areas are movement control points where resources are received, prioritized and organized prior to deployment. The location of staging areas for the RMOW and DOS will depend on the location of the emergency, impacts, requirements and availability of facilities and resources. Potential local staging areas in the DOS and RMOW have been identified in the Operational Evacuation plan.

There are provincial, regional and local staging areas:

- Provincial: initial receipt and sorting of inter-provincial, national or international resources (responsibility of the SWE PREOC)
- Regional: intermediate management of resources within or in close proximity to the impact area. This could include any of the communities in the Sea to Sky Corridor, in addition to West Vancouver, North Vancouver and Kamloops on either end of the Corridor
- Local: a location managed by the DOS or RMOW to receive, store or forward resources within the municipalities for response and recovery activities.

EMBC coordinates provincial government stakeholder ministries and other private and public stakeholders to organize the various aspects of provincial and regional staging areas. Local governments coordinate private and public stakeholders to organize the various aspects of local staging areas in their jurisdiction. Staging areas are established based on local plans and hazard risk assessments, using multiagency agreements to enhance capability during times of need. Staging areas will be maintained for as long as required during response and recovery.

TRANSFER POINTS

Transfer points are locations or facilities where the transfer of resources or personnel can occur between one mode of transportation to another.

IDENTIFICATION REQUIREMENTS FOR USE OF DRT

Access to the routes and modalities of DRT will require the following identification for responders and transit staff:

1. Canadian or provincial government issued photo identification (e.g. driver's licence, BC Services Card, Canadian passport, Protocol Identity Card); and

2. Employment identification (e.g. badges, transit ID, business cards or other identification issued by the employer); or

3. Public safety lifeline volunteer ID cards (for Search and Rescue, Royal Canadian Marine Search and Rescue, radio, and Emergency Social Services volunteers)

This identification is for transportation only, and unrelated to identification required for security purposes.

Roles and Responsibilities of Agencies

Executing a mass evacuation across a large area with multiple jurisdictions requires many agencies and clarity on the role of each agency. This section outlines the general roles and responsibilities of local, provincial, federal, private and not-for-profit agencies during a mass evacuation of the RMOW or DOS. The specific tasks and resources, including estimated timeline for implementation or delivery, are included in the Operational Evacuation Plan.

When preparing for or executing an evacuation there are roles and responsibilities common to all agencies which include:

- Participate in evacuation planning and exercises
- Activate agency EOC when notified of a mass evacuation
- Provide a representative to the local government EOC. If this is not possible provide a 24/7 direct point of contact to the local government EOC
- Coordinate public information related to the evacuation with the local government EOC
- Provide situational updates to the local government EOC

This section includes agencies with major jurisdictional or operational roles during the execution of a mass evacuation. Specific job action sheets with detailed tasks are available in the Operational Evacuation Plan.

There are several other agencies that may provide support or resources in an evacuation that are not included in this section; these are included in the Operational Evacuations Plan.

Local Government Agencies

DOS AND RMOW

Potential roles of DOS and RMOW in evacuation operations:

- Lead for all aspects of emergency preparedness, response, and management within municipal boundaries - jurisdiction is limited to the boundaries of their municipalities
- Assist in coordination and liaison with neighbouring local governments and provincial agencies
- Monitor events and issue warnings
- Establish an EOC to facilitate centralized decision-making, acquire and coordinate resources (vehicles, personnel, equipment), and share information to ensure a common operating picture
- Primary communication and coordination link between agencies and organizations involved in the evacuation
- Provide data and information to response agencies and support agencies
- Support evacuated people through Emergency Social Services
- Assist people that cannot evacuate
- Disseminate public information
- Oversee evacuation on municipal roads
- Monitor the progress of the evacuation
- Coordinate damage assessments to inform the re-entry process

SQUAMISH NATION

Squamish Nation members are descendants of the Coast Salish Aboriginal people, who have lived in this area since before recorded time. Squamish Nation Chiefs and Council provide support and services to its members, including family services, education, employment and training, housing and health services. The DOS and RMOW are within the traditional territories of the Squamish Nation and the band is a key emergency response partner. Squamish Nation is a Nation outside of Treaty. Aboriginal Affairs and Northern Development Canada (AANDC) holds legislated responsibility for emergency management on First Nations reserves. Through a Letter of Understanding with AANDC, EMBC support the provision of emergency response and recovery services to First Nations communities when requested by either AANDC or the local Band Council.

Potential roles in evacuation operations:

- Issuing Band Council Resolutions to alert or order evacuations within Nation territory
- Liaison with EOC to coordinate evacuation of Nation members
- Provision of expert local knowledge to evacuation planning and implementation

LÍL'WAT NATION

Líl'wat Nation members are descendants of the Interior Salish Aboriginal people, and Líl'wat is a separate and distinct Nation with cultural and kinship ties to the St át y emc. The RMOW is within the traditional territories of the Líl'wat Nation and the band is a key emergency response partner.

Líl'wat Nation is a Nation outside of Treaty. Aboriginal Affairs and Northern Development Canada (AANDC) holds legislated responsibility for emergency management on First Nations reserves. Through a Letter of Understanding with AANDC, EMBC support the provision of emergency response and recovery services to First Nations communities when requested by either AANDC or the local Band Council.

Potential roles in evacuation operations:

- Issuing Band Council Resolutions to alert or order evacuations within Nation territory
- Liaison with EOC to coordinate evacuation of Nation members
- Provision of expert local knowledge to evacuation planning and implementation

VILLAGE OF PEMBERTON

Pemberton is located 159 km north of Vancouver on Highway 99, and is a key regional emergency response partner. Pemberton has a population of approximately 2,574 people.

Potential roles in evacuation operations:

- Support with receiving evacuees (reception centre, group lodging)
- Provision of resources to assist in evacuation efforts (personnel, equipment, etc.)
- Assist in providing evacuees with information if they are passing through or stopping in the Village

SLRD

the Squamish-Lillooet Regional District (SLRD) is a local government federation consisting of four member municipalities (District of Lillooet, Village of Pemberton, Resort Municipality of Whistler, District of Squamish) and four unincorporated rural Electoral Areas (A, B, C, D). The SLRD is found within the traditional territories of the Líl'wat, Squamish and St'at'imc Nations.

Potential roles in evacuation operations:

- Coordination, access, and outreach to rural populations

RCMP

Potential roles in evacuation operations:

- Maintain law and order
- Take all measures within their authority to protect life and property
- Lead and manage tactical evacuations within RCMP authority and capability. Involved in planning and implementing highway contraflow operations
- As tasked by the EOC, lead the physical notification and evacuation of people
- Provide situational reporting to the EOC
- Provide security of evacuated area
- Provide site security for helicopter landing sites as needed

WHISTLER AND SQUAMISH FIRE RESCUE SERVICES

Potential roles in evacuation operations:

- Lead and manage tactical evacuations within FRS authority and capability. Involved in planning and implementing highway contraflow operations
- Oversee the evacuation of people and animals from buildings, when potential life safety is at risk
- Provide fire suppression operations and the rescue of people trapped by fire, wreckage and debris, and coordinate specialized resources for Light Urban Search and Rescue (LUSAR) and Rapid Damage Assessment (RDA).
- Provide first responder medical aid response in conjunction with other responders
- Activate mutual aid as required

LOCAL TRANSIT OPERATORS – WHISTLER TRANSIT, SQUAMISH TRANSIT

Potential roles in evacuation planning and operations:

- Assist with coordination of transportation of resources through EOC Transportation Section
- Curtail regular transportation services, if necessary and appropriate
- Liaise with BC Transit EOC
- Bring in extra staff if needed

WHISTLER HEALTH CARE CENTRE, SQUAMISH GENERAL HOSPITAL

Potential roles in evacuation operations:

- Provide healthcare to patients
- Coordinate the evacuation of health facilities as necessary
- Refer overflow acute trauma patients to Lions Gate Hospital or Vancouver General Hospital

LOCAL SCHOOLS AND CHILDCARE FACILITIES

Potential roles in evacuation planning and operations:

- Coordinate the care of children who have been separated from their parents or caregivers during school hours
- Ensure parents and caregivers have access to appropriate information and support during all evacuations
- Organize the supervision of students
- Communicate student transportation needs to the EOC

Provincial Government Agencies

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE (MOTI)

MOTI has the authority over public transportation networks in BC including ports, airports, public transit, ferry services, roads and cycling networks. MOTI is responsible for the following Crown Corporations: BC Railway Company, BC Transit, and ICBC. MOTI's mandate is to ensure the safe and efficient movement of people and goods provincially, nationally, and internationally.

Potential roles in evacuation operations:

- Coordinate and control emergency highway traffic management in conjunction with the RCMP, municipal roads works staff and other relevant agencies;
- Ensure public safety and availability of transportation routes to emergency services;
- Coordinate services required for performing road repairs and implementing traffic control devices, such as signs and barricades;
- Provide resources (traffic management personnel, equipment);
- Activate emergency BC Ferry plan as requested by EMBC;
- Posting advisories on electronic message boards along designated routes;
- Coordinate exemptions from selected road rules and regulations. (e.g., driver hours, vehicle weights, speeds);
- Coordinate, develop and disseminate status reports of key transportation systems (all modes) and critical routes (including updating of Drive BC and other web or social media communications channels);
- Coordinate the mobilization of personnel and equipment in support of provincial transportation operational requirements in areas such as bridge engineers, geotechnical engineers, traffic engineers, etc;
- Authorize the closure of provincial transportation routes, including highways and inland ferries;
- Delay any work that negatively impacts the existing traffic flow until evacuation traffic volumes have cleared;
- Assess, prioritize, and repair any damage to transportation infrastructure

EMERGENCY MANAGEMENT BC (EMBC)

EMBC is a division of the Ministry of Public Safety and Solicitor General, and is administered under the BC Emergency Program Act (which also provides the authority for evacuations). EMBC coordinates the provincial response to emergencies and provides specialized resources to support local government emergency response activities, including evacuations. On a day-to-day basis, EMBC is available to respond to local government and agency calls through Emergency Coordination Centres (ECC) that are staffed 24/7and provide training to municipal staff and volunteers.

Potential roles in evacuation operations:

- Activate, on short notice, one or more Provincial Regional Emergency Operations Centres (PREOCs) and/ or the Provincial Emergency Coordination Centre (PECC) to coordinate provincial response and recovery, monitor emergency events and assist impacted communities in emergency response and recovery, including evacuations.
- If several ministries are involved in an integrated provincial response such as an evacuation, EMBC will coordinate integrated provincial emergency management through the PREOCs and PECC.
- Serve as a link between provincial ministries and local government EOC.
- Issue task numbers to local governments for emergency events, which opens the door for providing specialized resource support and response funding through the PREOC.
- Support the local government EOC in the execution of the evacuation by brokering resources (i.e. fuel trucks, transit para-transit resources, busses, airplanes, etc.), tasking provincial agencies to provide support, approve Expenditure Authorization Forms, elevate resource requests to the Federal Government (ex. DND)

BC WILDFIRE SERVICE (BCWS)

BC Wildfire Service (BCWS) is a division of the Ministry of Forests, Lands and Natural Resource Operations and Resource Development. BCWS is responsible for managing wildfires on Crown land. In the event of an interface fire within or encroaching on the DOS or RMOW boundaries, BCWS would assist and support the local fire rescue services.

Potential roles in evacuation planning and operations:

- Provide support to the EOC, including updates on wildfire behavior and movement, estimated hazard impact timings,
- Support site activity through the provision of personnel, equipment, supplies, telecommunications equipment, aviation support and weather information to assist in emergency response operations.
- In the event that air assets are required on a large scale for evacuation efforts as well as wildfire response, BCWS would provide an air marshal to the local airports to coordinate air movements.
- If BCWS believes a community is at risk, will recommend an Evacuation alert or Evacuation order be put in place

SCHOOL DISTRICT #48

School District #48 (SD#48) will provide for the safety of children, teachers and staff. SD#48 is responsible for developing school emergency plans and ensuring that staff and students have been trained and exercised in the details of the plans. SD#48 will activate a centralized EOC to coordinate all activities and response needs of the various schools impacted by an emergency situation. The SD#48 EOC will communicate with the DOS or RMOW EOC, on their status and identify what emergency assistance they require. SD#48 will use their transportation resources to move children, teachers, and staff to areas of safety. SD#48 will make buses available for use for municipal evacuation activities when school is not in session or after ensuring the safety and evacuation of students, teachers, and staff.

Potential roles in evacuation operations:

- Acquire the use of SD#48 transportation resources and coordinate these resources with the EOC
- Provide for safety of all children, teachers and staff within SD#48
- During emergency situations impacting DOS or RMOW schools, implement the appropriate school emergency plan or school evacuation plan
- Communicate priority needs to the DOS/RMOW first response agencies and the DOS/RMOW EOC
- Provide school facilities and school resources for emergency use (e.g., ESS reception centres), as requested

School boards may temporarily close a school building if the health or safety of students is endangered.

BC TRANSIT

Potential roles in evacuation operations:

- Maintain scheduled transit service in unaffected areas
- Assist in the provision of accessible buses and HandyDART buses to support the evacuation of people with mobility challenges
- Maintain scheduled transit service in unaffected areas
- Coordinate provincial resources available to assist in the event
- Ensure Critical Assets are noted with PREOC/EOC
- Coordinate with local operating company to ensure adequate resources are maintained to support event, (e.g. fuel, personnel)

BC FERRIES

Potential roles in evacuation operations:

- Activate Highway 99 Emergency Ferry Plan if requested to assist with evacuation at Darryl Bay and Porteau Cove emergency ferry docks
- Liaise with EOC to provide information on ferry assets and operations as requested
- Provide personnel to EOC Transportation section as required

FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT (FLNRORD)

Responsible for land and resource management in BC, including responsibility for wildfire management and safe public access to recreational activity such as hunting, fishing, and access to BC's wilderness and backcountry.

Potential roles in evacuation operations:

- Support site activity including opening and closure of FSRs to allow/prevent access during an evacuation
- Liaison with EOC to provide information updates on rural and wilderness areas and resources under FLNRORD's jurisdiction
- Provision of resources (personnel, equipment) for site support efforts in evacuation and traffic management
- Responsible for issuing River Forecast Centre flood advisories/warnings

VANCOUVER COASTAL HEALTH/MINISTRY OF HEALTH/HEALTH EMERGENCY MANAGEMENT BC

Potential roles in evacuation operations:

- Provide and coordinate ambulance services and triage, treatment, transportation and care of casualties
- Coordinate the evacuation of health care facilities, if required
- Provide the continuity of care for patients evacuated from hospitals or other health institutions and for medically dependent patients from other care facilities
- Provide support services for physically challenged or medically disabled people affected by an emergency

BC EMERGENCY HEALTH SERVICES (BC EHS)

Potential roles in operations:

- BCEHS will provide ambulances, trained personnel and whatever other essential resources may be required to assess, treat, stabilize, transport and deliver patients with medical needs to appropriate medical care facilities
- Assist in the evacuation of local health care facilities as required
- Coordinate the triage and transportation of all injured people to hospitals and health care centers
- Oversee critical care transport of injured as required

Federal

CN RAIL

To be confirmed by EMBC

CANADIAN ARMED FORCES

Local government and provinces are the first to respond in an evacuation. If they become overwhelmed, they may ask the Canadian Armed Forces (CAF) for assistance. This includes the Canadian Army (CA), the Royal Canadian Air Force (RCAF), and the Royal Canadian Navy (RCN). The Canadian Joint Operations Command (CJOC), a central CAF command unit directs the operation once CAF is deployed and coordinates the response with the respective regional joint task force. The regional joint task force closest to the Sea to Sky is located in Victoria.

CAF members who respond can specialize in areas such as:

- engineering
- health services
- force protection
- transportation
- aviation
- logistics

TRANSPORT CANADA

Transport Canada is the federal regulatory agency responsible for transportation policies and programs, and works to promote safe, secure, efficient and environmentally-responsible transportation. This includes responsibility for regulating air, marine, rail, and road transportation. Transport Canada's Pacific Regional office is located in Vancouver.

Potential roles in evacuation operations:

- On request from the Province, assist in ensuring public safety and availability of transportation routes, resources, and intelligence to emergency services;
- Coordinate adherence and exemptions from selected requirements/regulations in a major emergency (e.g. use of Squamish Terminals for marine evacuation of people).

Private Entities

PRIVATE TRANSPORTATION AGENCIES

Potential role in evacuation operations:

- Transportation of people without private transportation; potential for accessible transit resources

WHISTLER BLACKCOMB:

Potential roles in evacuation operations:

- Support evacuation operations with personnel and resources (buses, first aiders, heavy equipment, fuel, radio)

BLACKCOMB HELICOPTERS

Potential roles in evacuation operations:

- Coordination of local and support helicopter resources

SQUAMISH TERMINALS

Potential roles in evacuation operations:

- Support air and marine evacuation by coordinating resources and facilitating access to infrastructure, in coordination with Transport Canada (e.g. helipad and docking facilities).

Non-Profit Entities

CANADIAN RED CROSS

Potential roles in evacuation operations:

- Support with emergency social services and mass care
- Family reunification services

TOURISM WHISTLER / SQUAMISH TOURISM

Potential roles in evacuation operations:

- Key communication conduit to employees, members, clients that have direct access to visitors that may require information
- Resource for occupancy and demographic information

Public Information

Once the decision to issue and evacuation alert or order has been made, the local authority will provide information to the public through official channels, including details about the situation, whether or not they will be affected (and if so, to what extent), and the specific actions they should take to evacuate from the hazard zone. It is a legislated requirement that once an evacuation alert or evacuation order has been issued, it must be effectively communicated to everyone in the evacuation area. This section outlines the form that evacuation warnings will take, and the methods that will be used for sharing necessary information.

Key Considerations

Public information should consider:

1. Multiple sources—timely, accurate, relevant information should be provided through official channels; the local authority should be the "source of truth."

2. Repetition—clear, concise messaging should be repeated.

3. Timeliness—information should be shared with the public as early as possible. Timely updates should be provided.

4. Clarity of message—messages should be simple, clear, concise and consistent.

5. Translation and language options— if needed, key messages should be translated for residents and visitors.

Message Dissemination

All public notifications and information for advance notice evacuations will be coordinated through the local government EOC Information Officer and approved by the EOC Director. The local government will share the information through the following channels. The RMOW and DOS have prepared a series of pre-scripted messages for use by the EOC Information Officer to ensure that public information is prepared and distributed as quickly as possible in an emergency.

Door to Door Notifications

Where time permits and resources are available uniformed officials will travel door-to-door to notify people of an evacuation alert or order. Door-knockers will use this interface as an opportunity to advise people of the actions they need to take, and to determine if people require assistance. In the case of an Evacuation Order, door-knockers will ask if people plan to comply with the Order. Door knocking is the most effective method of issuing evacuation alerts and orders but is extremely resource intensive. The average rate of door knocking for evacuation warning is 12 houses per team per hour in a typical urban centre. If door knocking is used as a method of ordering evacuations then it is recommended that doorknockers:

- are uniformed members of a recognized organization;

- that they work from a script; and

- if possible provide handouts of written information to residents.

Written Information

The EOC will prepare the written documentation for door knockers; again this is approved by the EOC Information Officer and EOC Director. There are a number of templates available to the EOC and door knockers. The timing of the alert or order, and the number of resources available in the EOC and on-site will dictate which templates are distributed.

The following templates are available in the Operational Evacuation Plan

- Evacuation Alert Template
- Evacuation Order Template
- Evacuation Alert Instructions for Door Knockers
- Evacuation Alert Resident Information Sheet
- Evacuation Order Instructions for Door Knockers
- Evacuation Order Resident Information Sheet

The door knocker instructions are to ensure the information delivered to residents is consistent and that residents understand what an alert and order mean and the actions they must take. The instruction sheets are especially useful for door knockers that have not received prior training; which is a possibility if resources are stretched and external agencies or convergent volunteers are used. The resident information sheets are designed to collect information to help the EOC to gain situational awareness and coordinate resources that reflect the population that may be, or is, evacuated.

Flagging Tape System

Door knockers will attach flagging tape to visible areas of buildings in the evacuation area when Evacuation Orders are delivered. Door-knockers will attach flagging tape to the front door handles of houses and individual apartment suites/building offices in the evacuation area. Flagging tape dispensers are available in the Evacuation Kits. The Evacuation Plan flagging tape colours are represented below:

BLUE	No Answer / No One Home
PINK	Residents Notified
YELLOW	Residents Evacuated
ORANGE	Resident Refuses to Leave
PINK & ORANGE	Resident Notified and Requires Assistance to Leave

PUBLIC ADDRESS SYSTEMS

During rapid onset emergencies requiring tactical evacuations, there may not be time, or it may not be safe, for emergency responders to knock on every door in the evacuation area. If there is not enough time for emergency responders to safely issue door-to-door notifications, alternate forms of public notification will be used such as driving through affected neighborhoods issuing notifications on public address systems.

LOCAL GOVERNMENT WEBSITE

If power and internet are intact, the main portal for up-to-date information will be the local government municipal website. An emergency alert will be posted on the home page of the municipal website. Emergency alerts will only be issued for current emergency events, including evacuation alerts and orders. Instructions for people in the evacuation area, regular updates and situation reports will be posted on the municipal website, as new information becomes available. In a mass evacuation, the website could be updated hourly or more as new information becomes available or conditions change.

RADIO AND TELEVISION BROADCASTS

The RMOW and DOS recognize that radio and television broadcasters are a critical resource in an emergency. Residents and visitors rely heavily on local broadcasters for emergency information. Evacuation information and updates will be broadcast on radio and television. This will be particularly effective if the Internet is not available or if people are in their cars and need updated information while they are en route. If the municipal website is functioning, radio and television broadcasters will be asked to monitor the local government municipal website for the most recent updates and to broadcast the information in a simple, clear, concise and consistent format. Information will also be shared with broadcasters through media releases.

In the RMOW, information will be broadcast on:

- Mountain FM 102.1
- Whistler FM 101.5
- Shaw TV
- Sea to Sky Channel 4

In the DOS, information will be broadcast on:

- Mountain FM 107.1
- Shaw TV
- Sea to Sky Channel 4

SOCIAL MEDIA

In addition to municipal websites, local governments will share timely information regarding the evacuation on Facebook and Twitter. The posts will include a link to the municipal website for more information.

In the RMOW, social media sites include:

twitter: @rmwhistler
facebook: rmowhistler

In the DOS, social media sites include:

twitter: @squamishtown
facebook: districtofsquamish

PUBLIC INFORMATION CALL CENTRE

Depending on the size of the evacuation a municipal public information call centre will be established to provide the community with a phone option for emergency and evacuation information. This may be more likely in the readiness phase, as it may not be safe to keep call-takers in the impacted jurisdiction, if an evacuation order has been issued.

POSTING NOTICES

Evacuation alert and evacuation order notices should be posted at the perimeter of all evacuation areas. In the case of an evacuation alert, notices should be posted at central places in neighbourhoods like post office boxes, apartment entrances, etc.

MEDIA BRIEFINGS

The EOC Information Officer will keep the media informed through regular updates (such as website and social media posts, news releases and interviews) and press conferences, so that accurate, timely emergency information is shared with the public.

STANDARDIZED MESSAGING

Every effort should be made to maintain a streamlined information management process to avoid inaccurate, conflicting, or misleading information being spread during evacuations. A standardized message should be used to increase credibility and avoid confusion. For example:

Message to public in the RMOW: Monitor Whistler.ca or listen to Mountain FM 102.1 for information and updates. If an emergency responder or municipal official comes to your door, follow the instructions provided to you.

Message to the public DOS: Monitor Squamish.ca or listen to Mountain FM 107.1 for information and updates. If an emergency responder or municipal official comes to your door, follow the instructions provided to you.

MESSAGE CREDIBILITY AND CONSISTENCY

The clarity, consistency, accuracy and credibility of information in the evacuation message directly influences the public's willingness to comply. Signs listing evacuation information will be displayed with an accredited logo (ex. RMOW, DOS, Fire Department, or RCMP logo). Social media posts and email messages will be sent from corporate email addresses and municipal social media channels. Messaging will originate from the EOC Information Officer, who will ensure that messages have been signed off by the EOC Director.

SPOKESPERSON

The Mayor is the official spokesperson for the RMOW or the DOS during regular business and emergencies. Depending on the specific circumstances, and at the discretion of the EOC Director and EOC Information Officer, emergency responders and subject matter experts may provide specific and technical information about the evacuation or emergency.

INFORMATION UPDATES

Ongoing communications will be maintained during the evacuation, and until the emergency is resolved and the evacuation alert or order is lifted. The purpose of ongoing communications is to provide:

- status updates about the emergency situation and response progress;
- information for evacuees;
- information for the general public about how to get in touch with evacuees; and
- updates on the estimated duration of the evacuation.

The Need for Ongoing Information

In an emergency, the need for ongoing, timely and accurate information and communication is paramount to ensure that all residents and visitors have access to information regarding the hazard, the level of risk the hazard is presenting, the action plan (assessment, evacuation, etc.), and the direct action they need to take to protect their life, health and property. Information may change frequently, and therefore a dedicated communications resource should be established to manage communications. The local authority must ensure that timely and accurate information is relayed to all partners and the public.

Communication with Vulnerable Populations

Vulnerable populations such as hospitals, schools, and daycares may require extra assistance in an evacuation and extra time to evacuate. They should be notified at the earliest possible time that an evacuation may occur – even before the Alert stage if possible. At this time, the EOC should engage in discussion with both the local facilities/operators and the provincial agency (VCH, SD#48) to determine trigger points for evacuating these facilities.

The Operational Evacuation Plan includes a specific checklist for the Notification of Vulnerable populations that includes:

- General information about the facility
- Contact information
- Specific questions to ask if an Alert or Order is issued. As an example, how many people require transportation from the facility?

Motorist Information

Before and during an evacuation, road users will require access to timely and accurate traffic and support service information. Information to road users will be provided via en-route signage, local broadcast media, and local government websites and social media before and during an evacuation. Specific signage locations and character-appropriate, pre-scripted messaging for the signage is available in the Operational Evacuation Plan.

Community Education and Awareness

A thorough and sustained public awareness program is a key component in the success of this Evacuation Plan. It is imperative that all residents know what to do in the event of a mass evacuation.

The public education program will focus on residents, businesses, schools, and tourism operators. Communication about the evacuation plan will occur:

- during the initial release of the evacuation plan;
- as on-going public education about the plan; and
- during an evacuation.

There are several key messages that will be part of the public education campaign. These include:

- Have a plan and an emergency kit in case you are directed to evacuate;
- In an evacuation, follow the instructions of emergency officials;
- Know your evacuation zone. Evacuations will likely be phased so please know your evacuation zone and leave when asked to leave;
- If you have a car, keep the gas tank full if an evacuation order is possible. Don't let the tank go below half-full in case fuel is scarce or gas stations are unable to pump gas;
- If you do not have a car, try and connect with a friend or family member that could give you a ride out of town in an evacuation. If this isn't an option know the location of your nearest transit stop and community muster point.

COMMUNITY EDUCATION & AWARENESS FOR TOURISM

The RMOW and DOS have a duty to assist tourists when they are threatened by a local hazard. This will likely be best achieved by supporting tourism industry staff training. There is a misconception that warning tourists of local hazards could negatively impact on the industry. Research has shown, however, that such warnings do not affect the tourism trade, but do have a positive effect in the event of emergencies. As part of the public education strategy for the evacuation plan, the RMOW and DOS plan to engage with the local tourism industry, through Tourism Whistler, Squamish Toursim, Whistler Blackcomb, the Whistler Chamber of Commerce, the Squamish Chamber of Commerce, and the Whistler Hotel Association.

COMMUNITY EDUCATION & AWARENESS FOR SCHOOLS

The RMOW and DOS will work with local schools to confirm transport plans for educational facilities. Transport plans may vary from hazard to hazard and will be dependant on many issues such as onset time and resources available. Transport options may include (but are not limited to):

- sending students home as per normal at standard finishing times, to evacuate with their families (suitable only advanced-notice only);
- sending students home early by bringing forward finishing times and arranging transport to come earlier. This requires considerable planning and communication as parents will need to go home from work, or pick children up from school; or
- arranging wholesale transport away from school and out of the evacuation area (to be reunited with family later). This option is the least preferable, but may be the only available choice for no-notice evacuations.

Note: Any transport options and plans must be well understood by parents of students, as it is the reaction of parents that can further complicate an emergency response. Parents need to be assured that their children are being taken care of, whether they are sheltering-in-place, being sent home, or being evacuated directly from their school. They need to trust that the schools evacuation plans will look after their children and that reunification is planned for.

PRE-SCRIPTED MESSAGING FOR EVACUATIONS

Monitoring & Pre-Planning				
Message Type	**Essential Message Content**	**Verbal Script**	**Additional Information to Consider**	**Additional Notes**
Applicable to: • Media Message • Website	• Date/Time • The [local government] is monitoring the situation and developing contingency plans • Where to access updates • General emergency preparedness reminder	• Logo • Date/time • Map (list addresses – 100 blocks) "[Lead agency] is responding to a [list hazard] in [list location]. The [local government] is monitoring the situation closely. There is no threat to public safety at this time. The [local government] Emergency Operations Centre has been activated and staff are preparing contingency plans should the hazard materialize. Monitor updates at **[local government website].** The [list hazard] is another reminder to prepare for emergencies. Have an emergency plan and kit, and have at least a half tank of fuel in your vehicle. If you do not own a vehicle, connect with family and friends that could give you a ride out of town if needed in an emergency"	• Is there a link to the lead agency? Example, wildfire of note on BCWS website?	
Social Media Message	• The [local government] is monitoring the situation and developing contingency plans • Where to access updates	"The [local government] is aware of the [list hazard]. [Lead agency] is monitoring the situation closely. There is no risk to the public at this time. Monitor updates at **[local government website]."**		

Tactical Evacuation (Leave Now)

Message Type	Essential Message Content	Script	Additional Information (Time Permitting)	Additional Notes
Verbal Message (Delivered by door-knocker)	· Official notice · Leave Immediately · Concise but accurate description of the situation · Specific area impacted · What to take (4 P's – people, pets, prescriptions, papers) · Where to go for further information (website, phone number to call) · Location of Reception Centre or alternate method of reporting that they are safe · Information for people that require assistance evacuating due to special needs or mobility limitations	"This is an official notice. An emergency situation exists [state hazard] and your area is being evacuated. YOU MUST leave immediately. Take household members and pets. If time allows take essential medications and papers. FOR YOUR SAFETY LEAVE IMMEDIATELY! Monitor local government website [website link] and local media stations [radio station]. Once you are at a safe location, call [public information call centre #] for more information and to register that you are safe. If you, or someone in your household have health or mobility issues that will prohibit them from evacuating call [public information call centre #]. It is the law that all minor children (under the age of 19) MUST EVACUATE."	· Time remaining before situation becomes critical · Route to take, areas to avoid · Expected duration · Location of assembly areas for people without personal transportation	Door-knockers should report the following: · People that require assistance evacuating, due to health or mobility issues · If people refuse to evacuate · If people refuse to evacuate & they have children under the age of 19 If people refuse to evacuate tell them you cannot guarantee their safety and that responders will not re-enter the evacuation zone to rescue them. Tell them they must remain on their personal property. Report this information.
Generic Pre-scripted Written Message Applicable to: · Door-knocker Written Message · Mass Notification Message	· Official notice · Leave Immediately · Emergency in your area · What to take (4 P's – people, pets, prescriptions, papers) · Where to go for further information (website, phone number to call) · How to report that they are safe · Information for people that require assistance evacuating due to special needs or mobility limitations	· Add Logo "This is an official notice. An emergency situation exists in your area and your area is being evacuated. YOU MUST leave immediately. Take household members and pets. If time allows take essential medications and papers. FOR YOUR SAFETY LEAVE IMMEDIATELY! Monitor local government website [website link] and local media stations [radio station]. Once you are at a safe location, call [public information call centre #] for more information and to register that you are safe. If you, or someone in your household have health or mobility issues that will prohibit them from evacuating call [public information call centre #]. It is the law that all minor children (under the age of 19) MUST EVACUATE."	· Date/time · Hazard type, location · Map of specific area impacted · Time remaining before situation becomes critical · Route to take, areas to avoid · Expected duration · Location of assembly areas for people without personal transportation · Location of Reception Centre or alternate method of reporting that they are safe	If there is time to issue a written notice with hazard and event specific information see Short Notice Written Message on page 5 for more information on short-notice written message content.

Media Message	• Official notice • Specific area that must leave Immediately • Concise but accurate description of the situation • What people evacuating should take (4 P's – people, pets, prescriptions, papers) • Where to go for further information (website, phone number to call) • Location of Reception Centre or alternate method of reporting that they are safe • Information for people that require assistance evacuating due to special needs or mobility limitations	"This is an official message for people in the [state specific area]. An emergency situation exists [state hazard] and your area is being evacuated. YOU MUST leave immediately. Take household members and pets. If time allows take essential medications and papers. FOR YOUR SAFETY LEAVE IMMEDIATELY! Monitor local government website [website link] and local media stations [radio station]. Once you are at a safe location, call [public information call centre #] for more information and to register that you are safe. If you, or someone in your household have health or mobility issues that will prohibit them from evacuating call [public information call centre #]. It is the law that all minor children (under the age of 19) MUST EVACUATE."	• Date/time • Time remaining before situation becomes critical • Map • Route to take, areas to avoid • Expected duration • Location of assembly areas for people without personal transportation • Location of Reception Centres & available assistance • What is being done to resolve the issue • When next update will be provided	
Social Media Message	• Leave Immediately • Hazard type, location • Routing • Where to access additional information	[State specific area] is required to evacuate immediately due to [state hazard]. See local government website for more information or call [public information call centre #].	• Direct back to local government website as main source of up-to-date information	

Evacuation Alert (Be Ready to Leave)

Message Type	Essential Message Content	Verbal Script	Additional Information to Consider	Additional Notes
Door to Door Verbal Message (Delivered by Door-Knocker)	• Hazard type, location (include Map, list addresses – 100 blocks) • Be prepared to leave at short-notice • List of what to prepare to take (4 P's – people, pets, prescriptions, papers) • Information for people that require assistance evacuating due to special needs or mobility limitations Information for people that will require assistance evacuating due to special needs or mobility limitations (if Order is issued) • Location of assembly areas for people without personal transportation (if Order is issued) • This Alert may be followed by an Order	"This is an Evacuation Alert Notice due to [list hazard] in your area. Your local government [insert name] is advising you to be prepared to evacuate on very short notice. You are NOT REQUIRED to evacuate at this time but should take action to prepare to evacuate in case an Evacuation Order is issued. BE PREPARED TO LEAVE ON SHORT-NOTICE Monitor local government website [website link] and local media stations [media stations] in case the situation changes. If you require more information or will require assistance to evacuate if an Evacuation Order is issued call [public information call centre #].		Door-knockers should report the following: • People that may require assistance to evacuate, due to health or mobility issues, if an Evacuation Order is issued
Evacuation Alert Applicable to: • Door-knocker Written Notice • Mass Notification Message • Media Message	• Date/Time • Official Message (logo's) • Hazard type • Hazard location (include Map, list addresses – 100 blocks) • Be prepared to leave at short-notice • List of what to prepare to take (4 P's and additional items) • Website link and local radio station channel to monitor situation • Public information call center number for more information and to arrange assistance • Information for people that will require assistance evacuating due to special needs or mobility limitations (if Order is issued)	• Logo • Date/time • Map (list addresses – 100 blocks) "This is an Evacuation Alert Notice due to [list hazard] in your area. Your local government [insert name] is advising you to be prepared to evacuate on very short notice. You are NOT REQUIRED to evacuate at this time but should take action to prepare to evacuate in case an Evacuation Order is issued. BE PREPARED TO LEAVE ON SHORT-NOTICE Monitor local government website [website link] and local media stations [media stations] in case the situation changes. If you require more information or will require assistance to evacuate if an Evacuation Order is issued call [public information call centre #]. If you, or someone in your household have health or mobility issues that will prohibit them from evacuating if an Order is issued Make a Plan Now or call [public information call centre #].	• Include location of Reception Centre and assembly areas on Map • Attach a list of what they should pack or a brochure about preparing for an Evacuation (what to take, meeting place for family and friends, preparing your home, etc.) • Information for people with special needs that will require assistance to evacuate if an Order is issued	
Social Media Message	• Be prepared to leave on short notice • Hazard type, location • Where to access additional information	An Evacuation Alert has been issued for [State area] due to [state hazard]. See local government website for more information or call [public information call centre #]		

Message Type	Essential Message Content	Verbal Script	Additional Information (if time allows)	Additional Notes
Door to Door Verbal Message (Delivered by Door-Knocker)	• Leave Immediately • Concise but accurate description of the situation • Specific area impacted • Route to take, areas to avoid • Information for people that require assistance evacuating due to special needs or mobility limitations • Assembly areas and instructions for people without personal transportation	"This is an official Evacuation Order. An emergency situation exists due to [list hazard] and your area is being evacuated. You are legally required to LEAVE IMMEDIATELY. Take household members and pets. If time allows take essential medications and papers. If you are leaving by car take this route [provide route information]. If you do not have personal transportation or a way to evacuate, report to the assembly area [location], a bus will be there. FOR YOUR SAFETY LEAVE IMMEDIATELY! A Reception Centre has been set-up at [insert location]. Report to the Reception Centre or call [public information call centre #] for more information and to register that you are safe. Monitor local government website [website link] and local media stations [radio station]. If you, or someone in your household have health or mobility issues that will prohibit them from evacuating call [public information call centre #]. It is the law that all minor children (under the age of 19) MUST EVACUATE."		Door-knockers should report the following: • People that require assistance evacuating, due to health or mobility issues • If people refuse to evacuate • If people refuse to evacuate & they have children under the age of 19 If people refuse to evacuate tell them you cannot guarantee their safety and that responders will not re-enter the evacuation zone to rescue them. Tell them they must remain on their personal property. Report this information.
Written Evacuation Order Applicable to: • Door-knocker Written Evacuation Order • Mass Notification Message • Media Message	• Date/Time • Official Message (logo's) • Leave Immediately • Concise but accurate description of the situation • Specific area impacted (include Map, list addresses – 100 blocks) • Route to take, areas to avoid • Information for people that require assistance evacuating due to special needs or mobility limitations • What to take (4 P's) if time • Location of assembly areas and instructions for people without personal transportation • Where to go for further information (website, phone number to call) • Location of Reception Centre or alternate method of reporting that they are safe • It is the law that all minor children (under the age of 19) must evacuate	• Logo • Date/time "This is an official Evacuation Order. An emergency situation exists due to [list hazard] and your area is being evacuated. You are legally required to LEAVE IMMEDIATELY. Take household members and pets. If time allows take essential medications and papers. If you are leaving by car take this route [provide route information]. If you do not have personal transportation or a way to evacuate, report to the assembly area [location], a bus will be there. FOR YOUR SAFETY LEAVE IMMEDIATELY! A Reception Centre has been set-up at [insert location]. Report to the Reception Centre or call [public information call centre #] for more information and to register that you are safe. Monitor local government website [website link] and local media stations [radio station]. If you, or someone in your household have health or mobility issues that will prohibit them from evacuating call [public information call centre #]. It is the law that all minor children (under the age of 19) MUST EVACUATE."	Attach map if available – if time include routes, assembly areas and Reception Centre locations	• Livestock information • Contact your insurance agent – your expenses while evacuated may be covered • ESS • Health/smoke inhalation • Tourists
Social Media Message	• Leave Immediately • Hazard type, location • Routing • Where to access additional information	An Evacuation Order has been issued for [state area] due to [state hazard]. If you are in this area YOU MUST LEAVE IMMEDIATELY. See local government website for more information or call [public information call centre #].	Direct back to local government website as main source of up-to-date information	

Evacuation Rescind (Evacuation Lifted)

Message Type	Essential Message Content	Verbal Script	Additional Information to Consider	Additional Notes
Verbal & Written Message Applicable to: · Door-knocker Verbal and Written Message · Mass Notification Message · Media Message · Social Media Message	· Date/Time · Hazard type · Locations of Rescind/Lift (include Map, list addresses – 100 blocks) · May be put back on Alert/Order · Safety, recovery and clean-up information · People that require assistance getting back into home	"The emergency situation due to [state hazard] has [resolved, improved] and affected residents are no longer at immediate risk." · Add date/time and logo to written messages	· May be put back on Alert/Order · Attach map of rescind area very, clean-up information, community information (schools)	

Access-Control (Re-entry)

Message Type	Essential Message Content	Verbal Script	Instructions for Security	Circumstances that may warrant re-entry
Re-Entry Point Verbal Message (Delivered by Security at Security Check-Point)	· Evacuation Order is in place · Whether or not re-entry is allowed and if their request meets criteria · Duration of access · Routing	Refusal Message "There is an Evacuation Order in place for this area. Your reasons for re-entry do not meet the criteria and I cannot jeopardize your personal safety. If you require more information or wish to follow-up with your inquiry call [Public Information Call Centre #].	· If their request is refused and they persist and enter, record license plate and report it · If you are not sure if re-entry is allowed or not sure if they qualify ask your Supervisor	Who decides the priorities – Incident Commander? Reasons for re-entry/ Special Circumstances · Pets · Medications · Feed livestock

Mass Shelter

As discussed, the purpose of evacuation is to move people, pets and livestock away from an actual or potential danger to a safer place. For this to happen safely there need to be provisions for alerting people and moving them, and plans to shelter and support them through to their eventual return and recovery. The BC Emergency Program Act requires local governments that evacuate their communities to make arrangements for the adequate care and protection of those people, livestock, animals and personal property.

For many people shelter accommodation will be their last resort, and they will seek lodging with family and friends. Wherever possible, this should be encouraged. Established support networks will generally offer more social, emotional, and practical support than can be provided in an emergency shelter.

An estimated 10 per cent of an evacuated population will require shelter to be provided by receiving communities and will not be able to draw upon their own personal resources and network, such as lodging with family and friends or receiving support through insurance provisions. Suitable reception centre and group lodging sites have been identified in the DOS, RMOW, and neighbouring communities in the corridor and on either end of Highway 99 (all municipalities in Metro Vancouver, Pemberton, and Kamloops). Reception centres will also form a critical communication link with the EOC in the affected community allowing information sharing and reunification for family members, who are separated during the evacuation process.

A list of designated reception centre and group lodging facilities, their locations, amenities and services, and activation process can be found in the Operational Evacuation Plan.

Pets

One of the main limiting factors in encouraging people with household pets to evacuate is the limited number of sites accepting both people and pets. Having an adequate number of co-located shelters with equipment and staffing, and informing the public about these shelters will encourage people to evacuate.

People, who have pets and require group lodging, will optimally find housing with a friend and family member. Co-located owner-pet shelters have be identified in sheltering communities where available, as an option for people, who evacuate with their pets. Use of such shelters should be encouraged and publicized, if other options are not possible.

Pet shelters may not be immediately adjacent to the human population shelter. In such cases, transportation to and from the shelters may need to be arranged. Separation of pets and owners should be avoided, if possible, but pets should not take the place of a person, if resources are limited. Service animals should not be separated from their owners, and adequate space for people with service animals will need to be provided in group lodging sites. Keeping people and pets together decreases stress for both people and their pets, and is less labour-intensive.

Pet shelter sites in neighbouring communities within and on either end of the Sea to Sky Corridor can be found in the Operational Evacuation Plan. Organizations like the Canadian Disaster Animal Response Team (CDART) can assist in the coordination and management of pet shelters. The CDART activation process is outlined in the Operational Evacuation Plan.

Livestock

Livestock forms a critical part of local businesses and regional economies, and not evacuating these animals may slow the overall economic recovery prospects of a region, leading to greater individual disadvantage for farmers. In additional to transportation challenges, the evacuation of any livestock is critically dependent on being able to relocate livestock to a suitable receiving or destination farm. The receiving farm must have the capacity to feed and water evacuated livestock for the required relocation time, which could be anywhere from weeks (e.g. during flooding) to potentially years (e.g. following a volcanic eruption). In some situations, localized stock movements to areas of lower risk within the same region may be appropriate (e.g. upwind of a volcano or to higher ground following a flood).

During emergencies, the primary responsibility for livestock protection lies with the individual farm businesses. If farm businesses have the ability to relocate livestock themselves, they are encouraged to do so. It is important to note that response costs incurred directly by farm businesses (i.e. fuel for the farmer's own equipment, the farmer's feed, etc.) are not eligible costs within a local authority response claim.

If farmers do not have the capacity to evacuate livestock themselves, support can be requested through the local authorities, and is covered by EMBC. Note: Non-commercial stock falls under the category of pets. A broad geographic assessment of risk and capacity related to farm businesses is completed by the local authority in consultation with BC Ministry of Agriculture. Depending on the nature of the disaster, the BWFS, Water Management Branch of the BC Ministry of Forests, Lands and Natural Resource Operations and Rural Development or EMBC will be involved where appropriate). Local authorities and provincial agencies agree that there is significant risk to livestock, and support relocation during the evacuation alert phase.

Potential livestock receiving farms or facilities are listed in the Operational Evacuation Plan.

Receiving Communities

Community liaison staff from the DOS and the RMOW will be deployed to reception centres and group lodging facilities in receiving communities to keep evacuees informed about the response and recovery process. If insufficient personnel from the DOS or RMOW are available, at a minimum there will be a direct point of contact to provide updates to facility staff. Updates can then be shared with evacuees through briefings, notice boards and website and social media updates.

Pass Through Jurisdictions

In a mass evacuation in the Sea to Sky Corridor, some communities may not house people but will experience the influx of traffic rolling through their community or jurisdiction. The local government that issued the Evacuation Order will notify each 'pass-through' jurisdiction and if necessary may request one or the following actions from the community/jurisdiction:

- give them a 'heads-up' that larger than normal traffic volumes will be travelling through their community or jurisdiction
- request that fuel operators extend their hours if possible
- ask local-area traffic to stay off main highway through the community if possible

Appendices

Appendix 1 Project Steering Committee List with Representatives

Entity	Representative
Project Coordination	
DOS	Megan Latimer, Emergency Program Coordinator
RMOW	Erin Marriner, Emergency Program Coordinator
DOS Fire Service	Fire Chief Bill Stoner
Local Government Representatives	
Squamish Nation	Michelle George, Squamish Nation Valley Administrator
Lil'wat Nation	Sylvia Dan, EPC
SLRD	Sarah Morgan, Emergency Manager
Village of Pemberton	Sarah Toews, Emergency Program Coordiantor
Traffic Representatives	
Ministry of Transportation and Infrastructure	Don Legault, Operations Manager
BC Transit	Stephen Anderson, Manager, Corporate Safety and Security
Squamish Transit	Andrew Lewry
Whistler Transit	Steve Antil
RMOW Transportation Advisory Group (TAG) Rep	Emma Dalsanto, Transportation Demand Coordinator
Squamish Terminals	Emma Jarrett
First Responder Representatives	
BC Wildfire Service	Rob Dombowsky
RCMP	Inspector kara Triance
Provincial and Federal Representatives	
Canadian Red Cross	Mandana Salimian
Emergency Management BC	John Hawkes, Regional Manager