

Squamish-Lillooet Regional District

Fire Services Assessment: Impact of Proposed Developments



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18 September 2020

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Executive Summary

The Britannia Beach Volunteer Fire Department (the “BBVFD” or the “Department”) provides fire protection and road rescue service within the Squamish-Lillooet Regional District (the “SLRD”) from the southern border of Squamish to the boundary with the Metro Vancouver Regional District (“Metro”) with some gaps south of the Highway 99 overpass at Porteau. The Department’s establishment bylaw identifies this area as the Howe Sound East Fire Protection Service area. The Department operates from a single fire hall at 360 Copper Drive and protects an estimated 590 residents in Britannia Beach and a further 250 at Furry Creek.

Three development projects are being planned, one each for the Britannia Beach, Furry Creek and Porteau areas. The first two are at various stages of project development and the approvals process with the SLRD; the Porteau development is relatively inactive at the present time.

Each of these proposed developments will have a material impact on the delivery of fire services. They will significantly increase the area population, as well as the number of commercial and multi-family residential properties. Multiple high buildings are under consideration, some of which could be as high as 15 stories.¹ The development at Britannia Beach by the Tiger Bay Corporation (“Tiger Bay”) includes single family and multi-family residential and commercial properties and has the potential to add an estimated 2,730 residents.² The Furry Creek area has been developed for a number of years and at this point consists of a golf course and townhomes and single-family residences. The Fine Peace Corporation (“Fine Peace”) is seeking approval for a full build out of Furry Creek in a series of seven phases. When complete, the number of residents could increase by some 2,700 from its current population of about 250.

Concord Pacific’s conceptual plans for the Porteau area contemplate a mix of residential and commercial development, and, if built out, could add a further 3,640 residents.

Provision of fire services for these additional areas, which will include fire inspections,³ road rescue and first medical response (“FMR”), will greatly increase the call volume for the

¹ A “high building” is defined in the BC Building Code as any building which is higher than 18 metres measured from grade to the uppermost floor, which differs from the NFPA standard, that defines a high building as one that is more than 75 feet (23 metres) measured from fire department access to the uppermost floor. See: BC Building Code Interpretation Committee, “Fire Department Connections for High Buildings,” (19 Feb. 2019), File 18-0001, at: <https://boabc.org/2019/12/18-0001-FD-connections-high-buildings.pdf>.

² The estimation of total potential population is based on using multipliers of 2.5 and 3.0 for residential units. It is agreed that this may result in estimates which do not completely reflect the developments as built, but are used to develop order of magnitude estimates for planning purposes.

³ At present fire safety inspections are not mandated for regional districts under the existing *Fire Services Act*. However, that act is being replaced by the *Fire Safety Act*, and subject to some planned amendments, and the issuance of required regulations, fire safety inspections are expected to be required for all parts of the Province. Even if the changes are not made to the *Fire Safety Act*, the SLRD

Department. It will also require the Department to change its level of service under the current version of the Playbook⁴ from Exterior to Interior Operations at a minimum. Proper servicing will require additional fire halls and apparatus, as well as an increase in the number of firefighters to address the requirements of the Fire Underwriters for the residential and commercial structures being contemplated. The move to Interior Operations will materially increase the Department's training requirements under the Playbook. Any changes to the current service level will also require a change to the operational bylaw which currently mandates the Department as Exterior Operations only.

These changes, both for the area and the Department, are substantial but in fairness they will occur over a significant period of time that may approach 20 years or more. The challenge for the Department and the SLRD, however, arises from the need to build out the Department as the developments begin to ramp up: the construction phase is actually a period of high fire risk. The Department will then need to further increase its capabilities to match emergency response requirements, which will be materially impacted by the addition of multiple high-rise structures. With the expansion that is planned around Furry Creek, a second fire hall will be required in that area – a need which is recognized in Fine Peace's planning.

The long-term plan for the Department must also contemplate the Porteau development, which potentially will have the highest population of the three projects being considered and which will require the addition of a third fire hall. When this development becomes active, the allocation of an appropriate piece of land and construction of a third fire hall need to be included in the discussions with the relevant developer.

The development at Furry Creek includes the provision of a second fire hall for the Department, the location of which is still being discussed with Fine Peace. The fire hall is being provided by the developer and should consist of a minimum of four apparatus bays and a training area. The location initially identified by Fine Peace for this new hall presented a number of challenges in terms of the size of the property, its orientation and its accessibility. The developer is now proposing an alternate site, which might provide a more suitable location and configuration.

As each of the developments proceeds the Department will need to recruit and train a considerable number of firefighters. The Department currently has some 28 active members responding out of the existing fire hall. To meet the requirements of the Fire Underwriters, the Department will require at least 10 members to respond out of its new second hall at Furry Creek (assuming that the second hall is treated as a satellite hall).⁵ This number, however, is the bare minimum and less than are necessary to properly support emergency responses to the

should still plan to undertake fire safety inspections given the nature and size of the planned developments.

⁴ Office of the Fire Commissioner, *British Columbia Fire Service Minimum Training Standards: Structure Firefighters Competency and Training Playbook* (2nd Ed., May 2015).

⁵ A satellite hall is one that the Fire Underwriters agree can operate with a minimum of 10 firefighters as opposed to 15. Their approval is subject to the hall meeting certain criteria (e.g., distance from the main hall, minimum equipment requirements, etc.).

planned developments. As such, while 10 new members at this second hall will be needed for qualification by the Fire Underwriters, the Department should plan to increase the number of members to at least 20 to meet its response requirements as the population grows.

With the addition of a second hall at Furry Creek, the Department will essentially be doubling in size. It also will be required to meet a higher standard of training for its operations, and to undertake additional services (e.g., fire inspections and pre-fire planning for the larger structures). Recruitment and training of this number of firefighters will require a significant change in effort from the Department and the SLRD for a number of reasons. First, the time to train a new recruit to Exterior Operations is estimated at 18 months or longer; Interior Operations training may require an additional six months or more, which means that it can take two years or longer to train recruits for interior operations. Both require extensive classroom work and hands-on training, and Interior Operations also requires live-fire training. Unless a training site is constructed, this training would need to take place at the facilities in Squamish or Lions Bay, both of which have expressed an interest in making their training sites available.

The Porteau development, whenever that project proceeds, would require an addition of at least 10 members in the third hall,⁶ along with apparatus and other equipment. As with the second hall, depending on the nature of the development, this number is the bare minimum for Fire Underwriters' qualification, and planning should be for at least 15 members.

Given the timeline required for building out the Department, and the overall response requirements for the new developments, the SLRD should seek to develop mutual aid arrangements with Squamish and/or Lions Bay. These agreements have been discussed several times in the past, but have never been consummated. One of the issues of concern for the neighbouring departments is that there would be, at least initially, a lack of "mutuality" in any such arrangement. As such, there likely will need to be provision for payment for services being received. These agreements can be structured as mutual aid (with cost recovery provisions), or an actual service agreement. The former provides for response to and from the respective service areas, but without guarantees and with the total right of recall. Service agreements provide a fee-for-service response where one agency does not require the service of the other. Lions Bay currently has a mutual aid agreement with West Vancouver as part of the Metro mutual aid agreement, and so does not require support from the BBVFD. It is also not clear what West Vancouver's view would be if it had to respond to Lion's Bay because the latter was out of jurisdiction at a response in the SLRD. Squamish lacks any mutual aid agreements at the present time though it has expressed interest in developing one with the BBVFD.

Combined operations involving multiple fire departments require a high level of coordination to ensure each department uses the same incident management system including personnel accountability and voice communications systems. The BBVFD and Squamish currently have at least one common radio channel but have not practiced interoperation at an emergency scene; both are dispatched by E-Comm. Lions Bay Fire Rescue is dispatched by the Surrey

⁶ Subject to the Fire Underwriters treating the third hall as a "satellite" hall.

Fire Department. It uses the E-Comm 700 MHz regional radio system which is fully encrypted and does not currently allow for voice interoperability with other radio systems.

In terms of how each of the three areas are built out, it is recommended that each of them be fully sprinklered. This was the case for the original development at Furry Creek and was achieved in 2003 with Bylaw No. 879.⁷ This bylaw did not apply universally and as presently worded, the additional development areas would not be included. Local government sprinkler bylaws now require approval from the Province. As such, the SLRD should make sprinklering requirements part of the initial development approval process.

The requirements to achieve protected or semi-protected status under the Fire Underwriters' system are discussed in detail in this report. There are two different assessments: one for single family residences, the other for multi-family residences and commercial developments (including strata developments). Given the proposed timelines for the two active developments, the Department should plan to operate from two fire halls as soon as the second one becomes available. Leading up to that it, it should seek to increase the number of available firefighters to a minimum of 40 members, with an emphasis on adding members from the Furry Creek area (who, ultimately, will be responding out of the new satellite hall).

The Department should develop a plan to become an Interior Operations Department within about three years and ultimately seek to become a Full Service department. As part of the move to Interior Operations, the Department will need to undertake appropriate pre-planning of the new major risks that are being built, to enable it to conduct interior operations in the high-rise structures and large commercial establishments that are being planned. Members' training will need to reflect the risks being faced, and, as a long-term goal, the BBVFD will likely need to become a Full Service department

Within the next three years, the Department should obtain and train on new apparatus for the second fire hall, which at a minimum should be a Type 1 Engine, a Quint/Ladder with a minimum 75 foot aerial ladder, and a Type 3 Engine along with one or more utility vehicles.⁸ At the same time, the fleet at the existing hall should be upgraded by replacing the existing Quint/Ladder with a similar unit, as the existing truck is too old to be included in the rating by the Fire Underwriters.

We recommend that, as it develops to meet its expanded mandate, the Department seek to emulate the response model of the Sechelt Fire Department (the "SFD"). The SFD protects a total population of just under 11,000 people, a size that is equivalent to that contemplated for the Howe Sound East area. It currently has six-storey buildings within its response zone, a significant interface risk and is operating with some 40 volunteers and five career members, at the Full Service level. The SFD has developed effective mutual aid with its neighbouring departments. As such, their response to a fire in a high-rise building involves their full department plus an engine from the departments at Roberts Creek and Halfmoon Bay as well

⁷ *Squamish-Lillooet Regional District Fire Limit Establishment Bylaw No. 879-2003.*

⁸ The different vehicle types are discussed in greater detail in the body of the report.

as a second Quint/Ladder from the Gibsons department. This equates to a total of four Type 1 Engines, one Type 2 Engine, two Ladder trucks and one Rescue/Equipment truck. This number of trained staff and quantity of apparatus follows the guidelines provided by the National Fire Protection Association (the “NFPA”) and addresses the requirements of the Fire Underwriters. For the BBVFD to achieve this level of response would obviously require a supporting response from Squamish and Lions Bay, making developing mutual aid agreements with those jurisdictions essential.

Finally, the bylaw defining the fire protection area (Bylaw No. 1032, as amended) should be reviewed as the additional developments are approved to ensure they are completely within the response area as that bylaw acted to reduce the service area footprint. One additional bylaw for consideration would be to require that private fire hydrants be regularly tested and their availability for service be regularly reported to the Department.

Current Context

Level of Service

The BBVFD operates at the Exterior Operations level of service as defined by the Playbook. The Department's service level is set in the SLRD's fire service administration bylaw: *Squamish-Lillooet Regional District Fire Services Administration Bylaw No.1561-2018* ("Bylaw No. 1561").⁹

The Playbook defines three possible levels of service: Exterior Operations, Interior Operations and Full-Service Operations (reviewed further, below). At each level, the particular department is expecting and able to undertake more aggressive fire suppression activities. The training requirements are tailored to the chosen level of service. When a department operates at the Exterior Operations service level, it means its members cannot enter a fire-involved structure with an "IDLH" atmosphere,¹⁰ whether for fire suppression or rescue purposes. The Department has approximately six members fully trained for Exterior Operations with the other members in the process of being trained to this level. In addition, the Department has three firefighters who meet the more challenging requirements for the Interior Operations service level.

Budget

The Department's budget for 2020 is \$345,439, which includes \$13,500 for training and \$30,000 for maintenance of apparatus and equipment. The Chief and Deputies receive an honorarium, every other member of the Department responds and trains without compensation.

Training

Members' training is undertaken primarily at the fire hall, which includes a recently expanded training yard on the north side of the hall. The Department also utilizes the training site at Squamish Hall 1, including the live fire facilities, where they attempt to provide each member with two days of exterior operations live fire training annually. Training records are maintained in a computer system that enables the Department to document training qualifications and level of service for each member individually.

Volunteers

The Department currently has a total of 28 members, 24 of whom are active, responding members. The Department has a Fire Chief and two Deputy Chiefs. One of the Deputy Chiefs is responsible for training, the other for operations and record management. The Department also has one Captain and four Lieutenants, along with 15 firefighters, four trainees, and one support staff/secretary who also responds to incidents.

⁹ Bylaw No. 1561, s. 4.1.

¹⁰ IDLH means "Immediately Dangerous to Life or Health."

Fire Hall

The existing fire hall is located at 360 Copper Drive in Britannia Beach. The building is approximately 10 years old and contains three apparatus bays, a training room, a mezzanine storage area, lounge, laundry room and kitchen. The hall also has a standby generator and a compressor to recharge air bottles. The hall is at capacity and has already been expanded twice over the past 10 years to accommodate the Department's apparatus.

Apparatus

The Department has two primary response units:

- Engine 1 - a Type 1 Engine, built in 2006 which has a 750-gallon tank and a pumping capacity of 1,050 GPM¹¹; and
- Quint 1 - an aerial apparatus, built in 1995, which has a 65-foot ladder, a 500-gallon water tank and a pumping capacity of 1,500 GPM.

The Department also has Rescue 1, built in 2016, which is the primary response vehicle for motor vehicle incidents ("MVIS") and FMR calls, as well as Utility 1, built in 2018, which is capable of a number of functions including carrying equipment for wildland interface fires.

Quint 1 is now beyond the age limit permitted by the Fire Underwriters and likely would not be credited in calculating the Department's response capacity for single family, or multi-family and commercial properties.¹² If the Quint is not included in the Department's response for rating purposes, it is possible that there could be a downgrade, which would potentially have a negative effect on insurance costs for the existing properties within the Department's response area. The apparatus requirements for the new Furry Creek fire hall, discussed in greater detail, below, also will include a Quint/Ladder with at least a 75 feet ladder. Ideally the two ladder units should be replicated as closely as possible to reduce training requirements, ensure interoperability and simplify long-term maintenance. Given the challenging geography faced by the Department, with steep inclines, some tight turning radii, and narrow access, the apparatus should be single axle units for greater maneuverability.

¹¹ Gallons per minute.

¹² The Fire Underwriters generally limit their rating of fire apparatus to equipment that is less than 20 years of age. It may be possible to get an extension granted for up to a further five years, by applying to the Fire Underwriters and meeting certain qualifications for the apparatus. See discussion in the Fire Underwriters section, below.

Response Analysis

The following response analysis is based on data from the E-Comm computer aided dispatch (“CAD”) system for the period 1 January 2011 to 5 May 2020. The analysis considers responses by year, month, day of the week and hour. The calls will be analyzed across the entire response area as well as by the three sub-areas which are Britannia Beach, Furry Creek and Porteau Cove.

The data include timestamps for enroute and arrival, which should provide an initial understanding as to the current capabilities of the Department.

The data set includes a large number of response codes, in particular those which are combined with BC Emergency Health Services (“BCEHS”). Of the 97 event types for all responses, 66 are those coded by BCEHS and for the purposes of the analysis these have been separated into one of two general groupings, those in the ‘29’ series for MVIs and all others which can be described as FMR.

The number of the Department’s responses by year, sorted by General Event Type is shown in Table 1. This table shows that most of the Department’s responses are for MVI and FMR calls, to which they began responding in 2015.

Table 1: BBVFD Responses by General Event Type

General Type	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
MVI		1			12	6	26	23	26	94
FMR					13	16	26	9	20	84
Smoke Showing	1	1	4	5	8	2	4	9	7	41
Alarms	3	2	11	2	6	1	6	5	4	40
Wildlands Fire	1	4	10	2	4	6	2	3	5	37
Assist	2	2	6	8	10	4	3			35
Illegal Burning	2	1	1	1		2	14	6	6	33
Vehicle Fire	2	2	2	1		3	3	5	10	28
Structure Fire	2	2	1		1			1	7	14
Chimney Fire		3						1		4
Mutual Aid	1				1	1		1		4
Hazmat			1		1			1		3
Wires Down								2		2
Rescue		1			1					2
Gas Leak/Spill				1			1			2

General Type	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
BBQ Fire									1	1
Vault Alarm					1					1
Total	14	19	36	20	58	41	85	66	86	425

Temporal Response Data

The data in the CAD for the BBVFD includes time stamps recording year, month, day and hour that provide a view as to how responses vary in a temporal sense.

Responses by Year

Responses by Year are shown in Figure 1 and this graph illustrates the degree to which the Department has become much busier, essentially quadrupling its emergency responses over the past nine years.

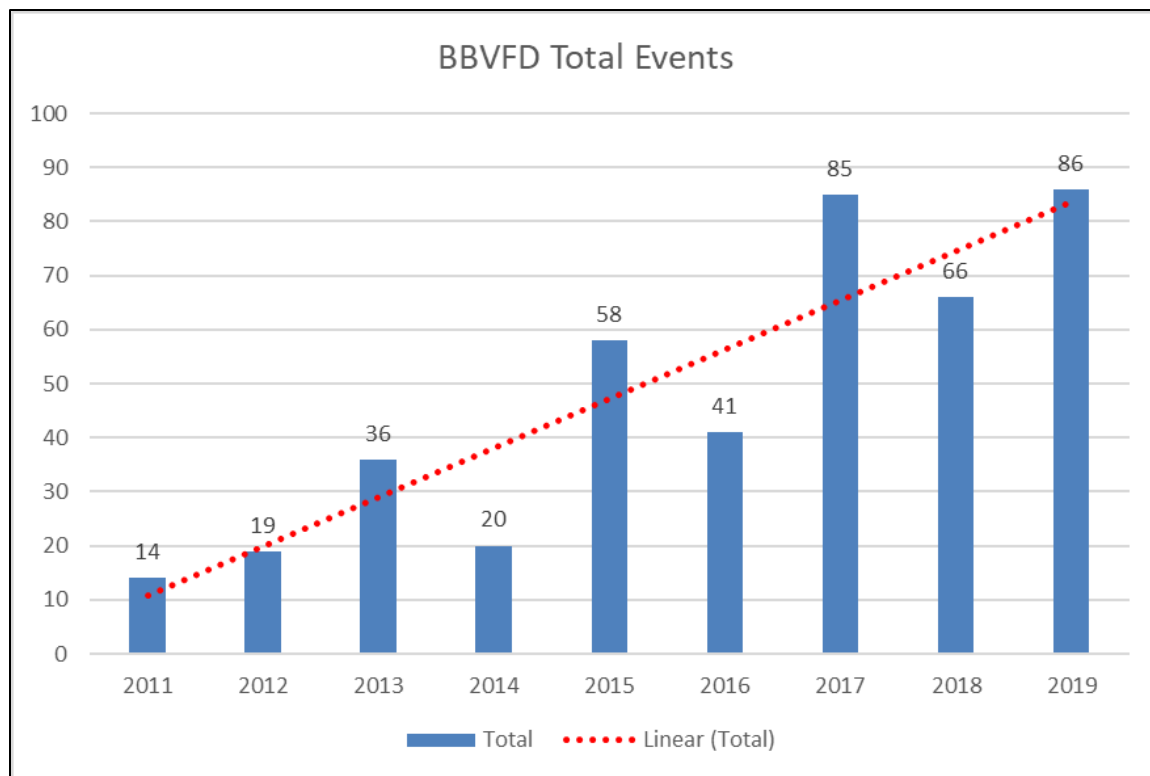


Figure 1: Responses by Year (n=425)

However, the impact of FMR and MVI events, to which the Department only began responding in 2015, has a disproportionate impact which is illustrated in Figure 2. When these two event types are removed there is still an increase over the period, but one which is not so dramatic.

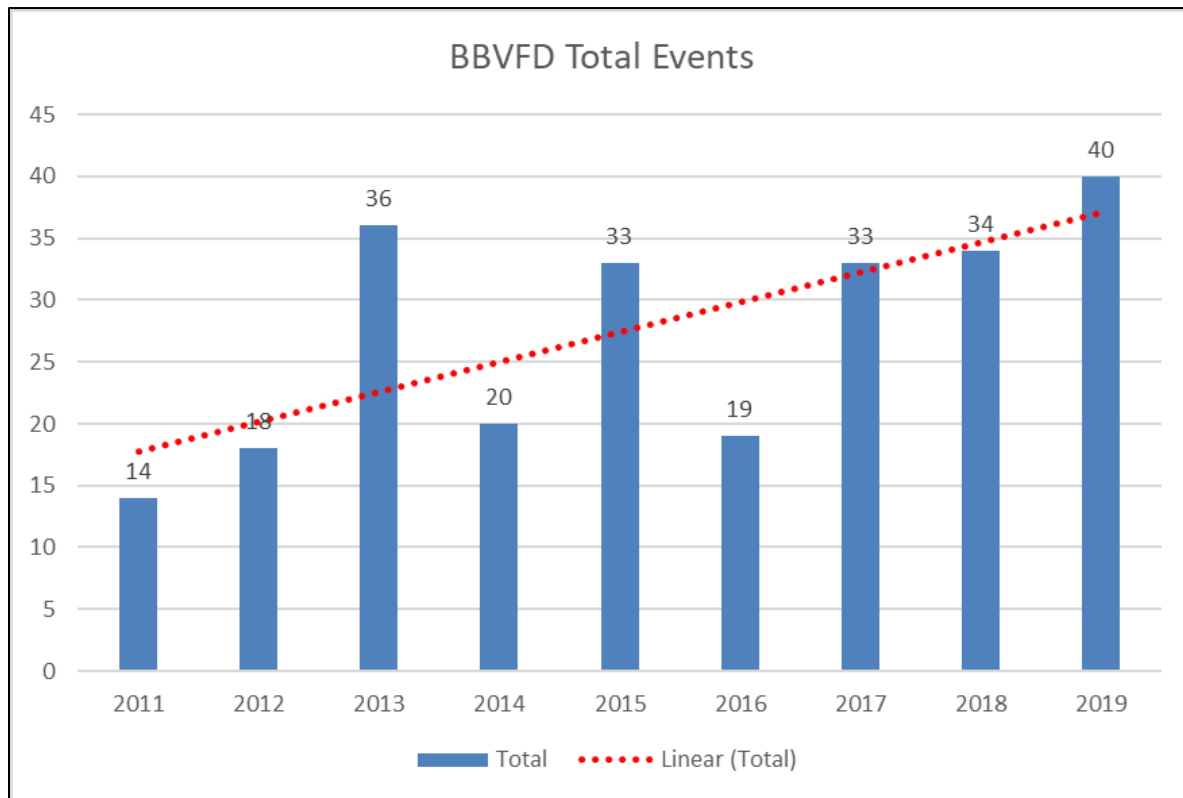


Figure 2: Responses by Year for all except FMR and MVI (n=247)

Responses by Month

Responses by Month are shown Figure 3, with peak event volumes in the summer months which is typical of most fire departments.

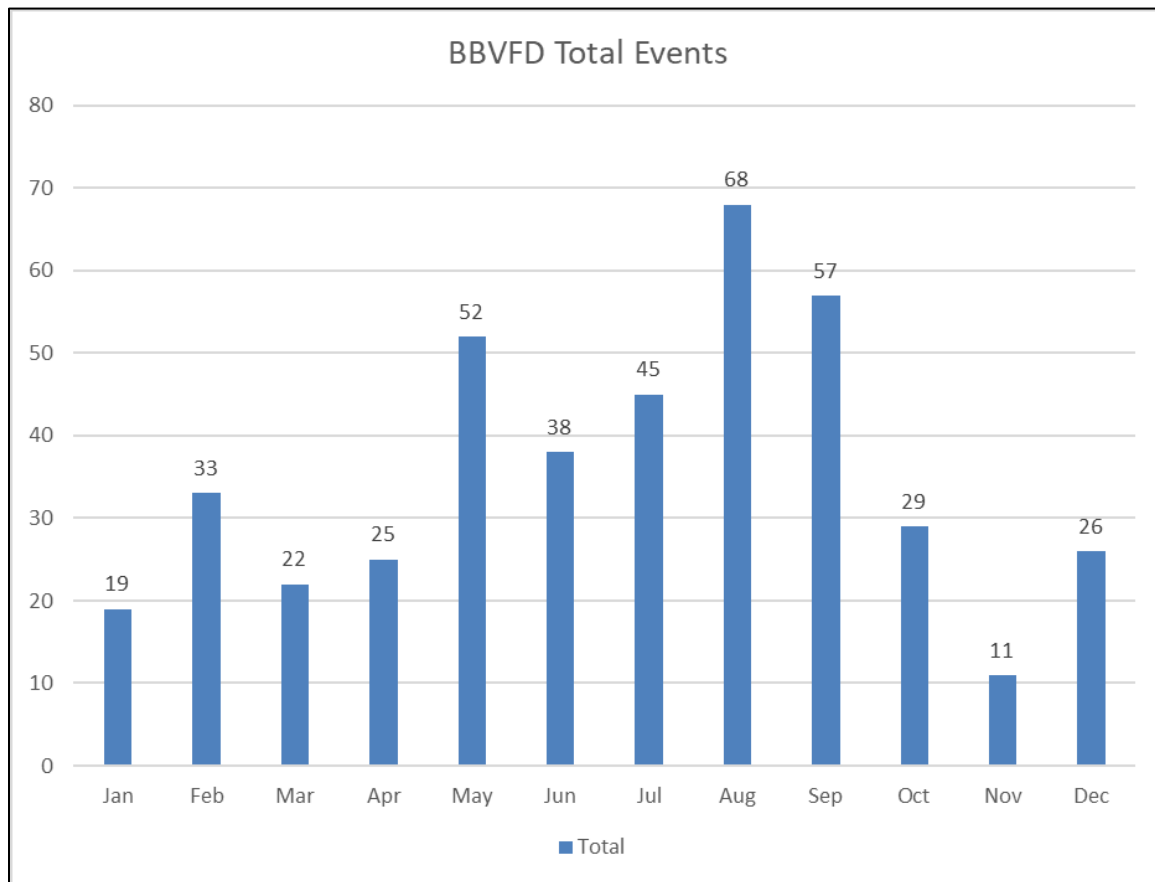


Figure 3: Responses by Month (n=425)

Responses by Day of the Week

Responses by Day of the Week are shown in Figure 4. Sunday is the Department's busiest day of the week by event volume.

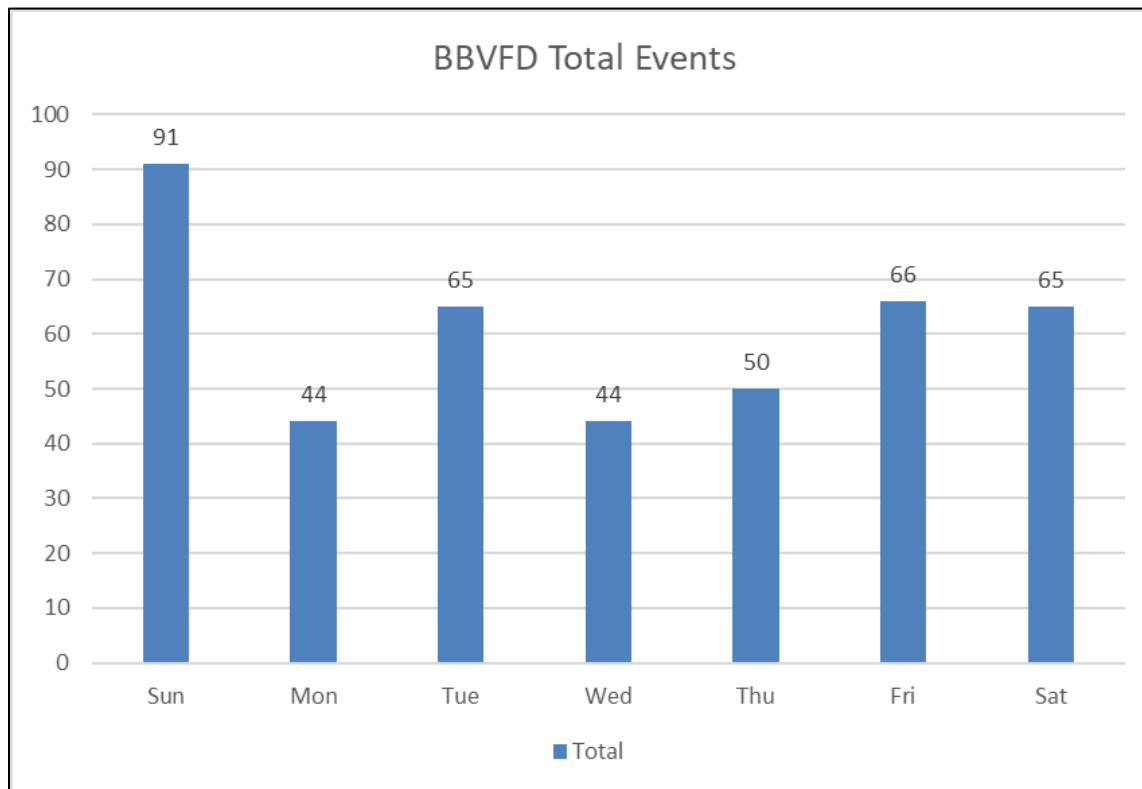


Figure 4: Responses by Day of the Week (n=425)

Responses by Hour

Total events by hour are shown in Figure 5. This response pattern is found in most fire departments which have a peak around noon that lasts into mid-evening and then declines after midnight.

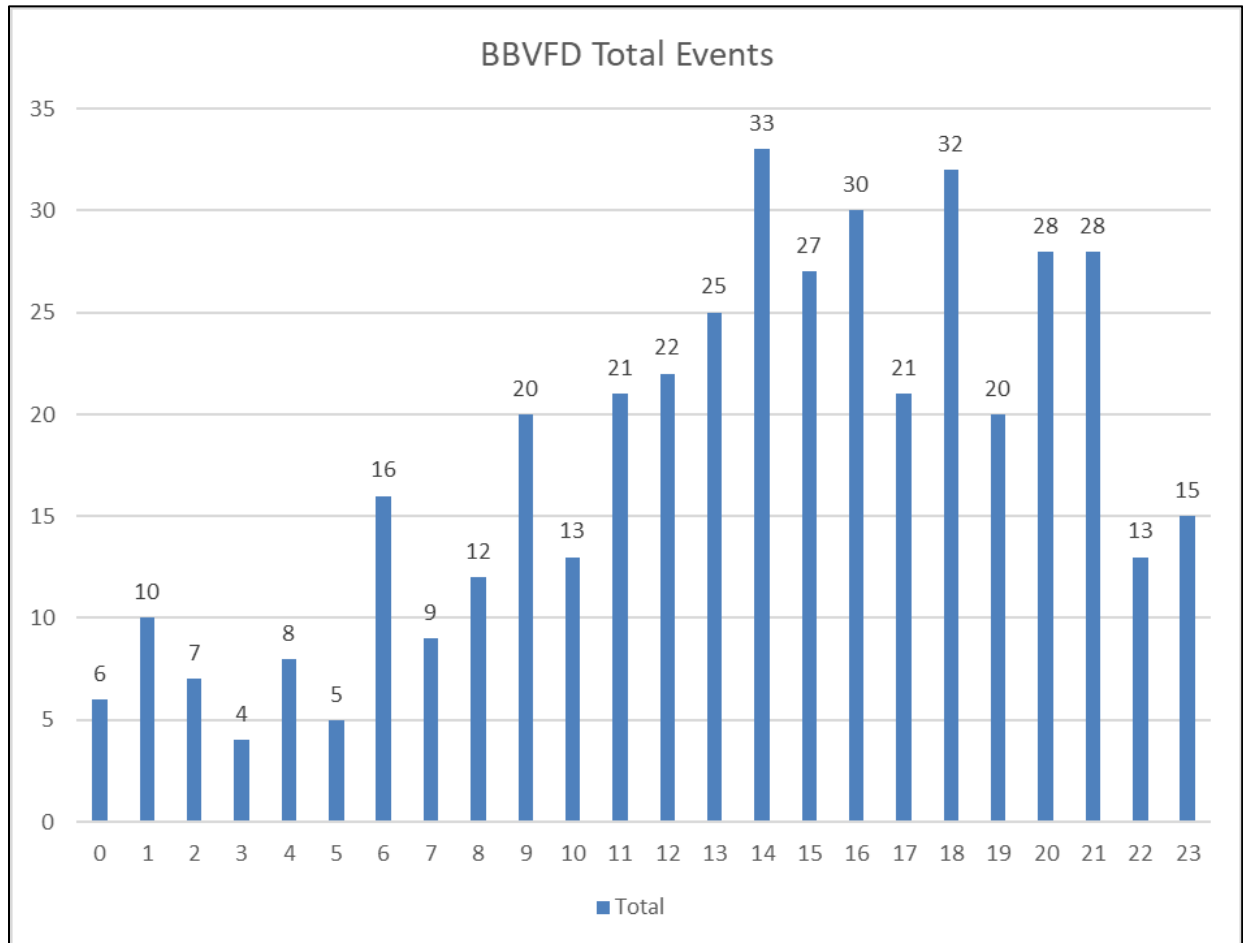


Figure 5: Responses by Hour (n=425)

Spatial Responses

Responses by the Department are within three principal response areas, each with a highway and non-highway component as follows:

1. Britannia Beach
 - ESZ 13300101: Britannia Beach, non-highway
 - ESZ 13300102: Britannia Beach, highway only
2. Furry Creek
 - ESZ 13300201: Furry Creek, non-highway
 - ESZ 13300202: Furry Creek, highway only
3. Porteau Cove
 - ESZ 13300301: Porteau Cove, non-highway
 - ESZ 13300302: Porteau Cove, highway only

By Jurisdiction

These responses are summarized in Table 2. This table shows 185 or 45% of all responses are on the Sea-to-Sky Highway (“S2S Highway”).

Table 2: BBVFD Responses within Jurisdictions and S2S Highway in each.

Jurisdiction	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Britannia Beach	8	16	18	12	22	11	22	15	19	143
Furry Creek	2	1	6	4	8	7	11	9	9	57
Lions Bay					8	3	2	1		14
Porteau Cove	1				5	2	5	2	5	20
S2S Highway, Britannia Beach		2	10	4	10	11	19	31	29	116
S2S Highway, Furry Creek	2		2		3	2	8	6	17	40
S2S Highway, Porteau Cove	1				1	5	13	2	7	29
TBD					1		5			6
Total	14	19	36	20	58	41	85	66	86	425

The data can also be analyzed by Jurisdiction and by Event Type. Table 3 shows non-highway responses to the three jurisdictions within the Department's fire protection area.

Table 3: Total Events for Britannia Beach, Furry Creek, Porteau Cove (Non-Highway)

Event Type	Britannia Beach	Furry Creek	Porteau Cove	Total
Alarms	26	19		45
Assist	25	1	2	28
Chimney Fire	3			3
FMR	33	23	10	66
Gas Leak/Spill		2		2
Hazmat	1	1		2
Illegal Burning	15	4	3	22
Mutual Aid	3			3
MVI	8		1	9
Rescue	2			2
Smoke Showing	9	5	3	17
Structure Fire	12	2		14
Vault Alarm		1		1
Vehicle Fire	2	2		4
Water Issue		1		1
Wildlands Fire	13	3	2	18
Wires Down	2			2
Total	154	64	21	239

This table shows that in terms of responses not on the highway, 64% are in Britannia Beach, 27% in Furry Creek and 9% in the Porteau area.

The occurrence of all responses can also be plotted to provide a picture of where the Department responds, within its response areas. These maps are provided in the next section.

Total Response Area

The Department's responses for all incidents are mapped in Figure 6 and include some responses to the south limit of its response area and one or two MVI incidents that occurred just into Metro.¹³

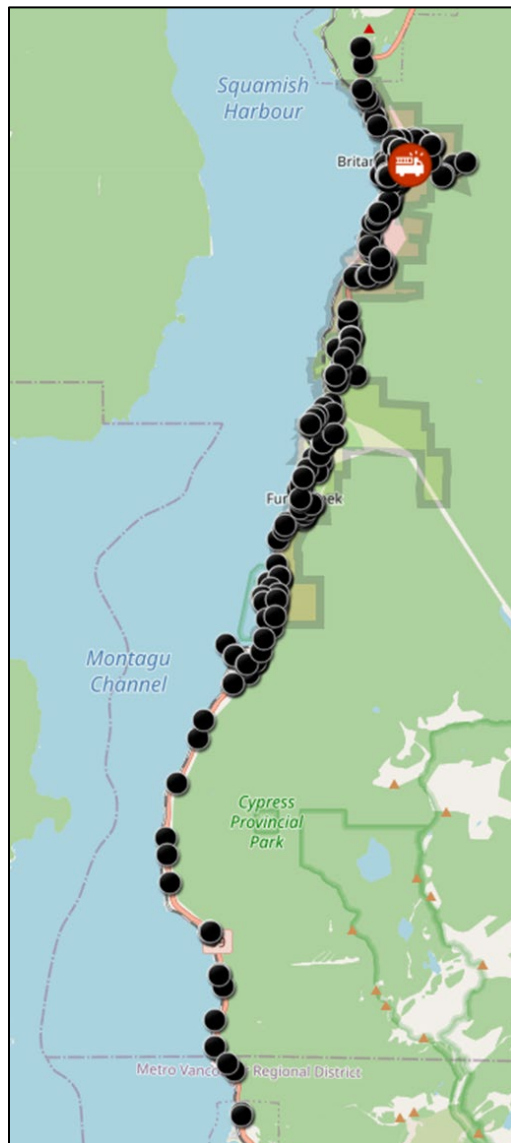


Figure 6: BBVFD Total Responses

¹³ The reasons for this include that many times the initial report of an event is less than accurate, and the final location is not determined until arrival. This possibility of a cross-border response emphasizes the need for properly structured mutual aid, to clarify that the Department has authority to respond within the boundaries of Metro.

Britannia Beach

The responses specific to the Britannia Beach area are shown in Figure 7 with a significant number of these being MVIs on Highway 99.

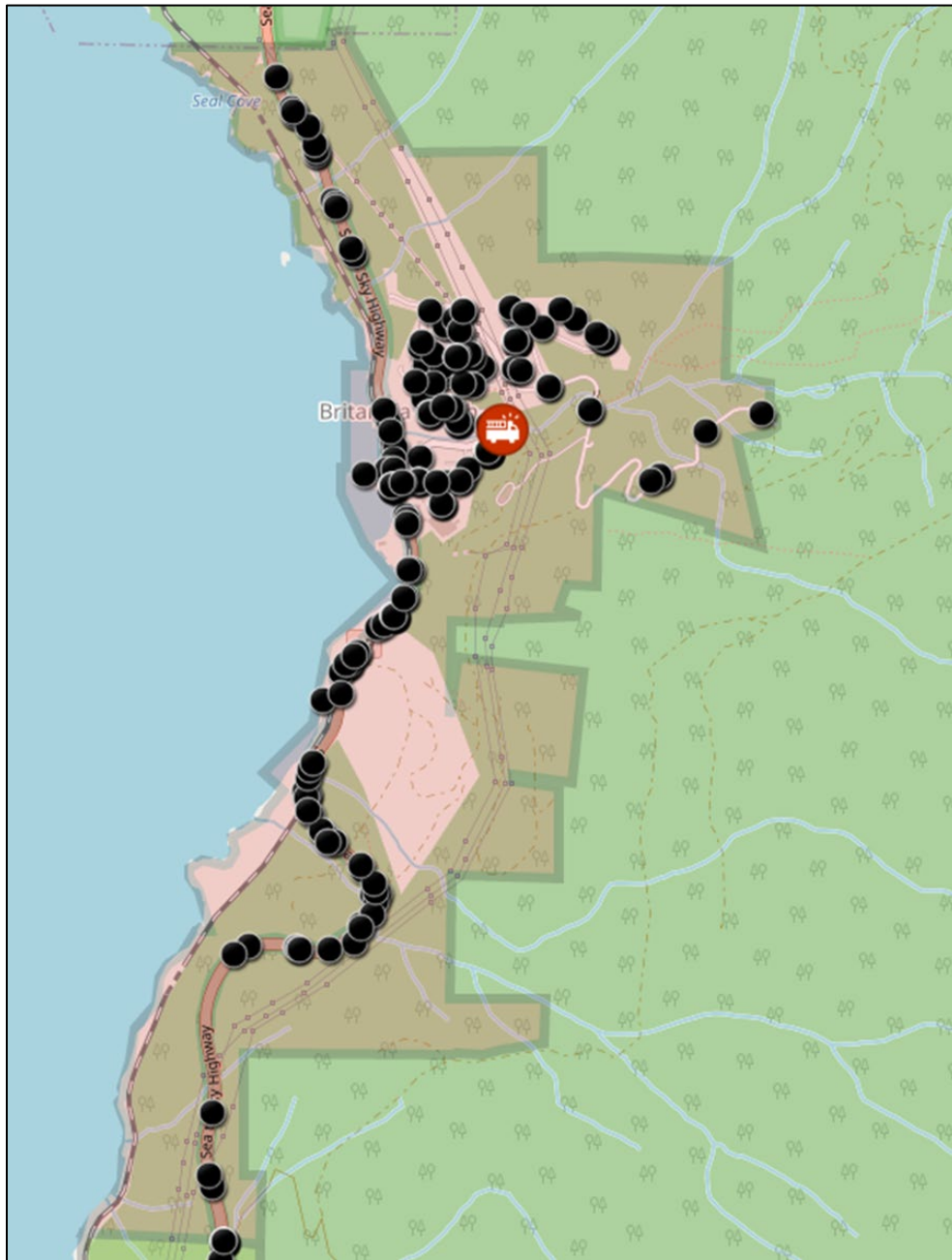


Figure 7: BBVFD Responses in Britannia Beach

Furry Creek

Responses to Furry Creek are shown spatially in Figure 8 . These responses include MVI calls to Highway 99 as well as various other incidents including responses for alarms ringing as shown in Table 3 above.

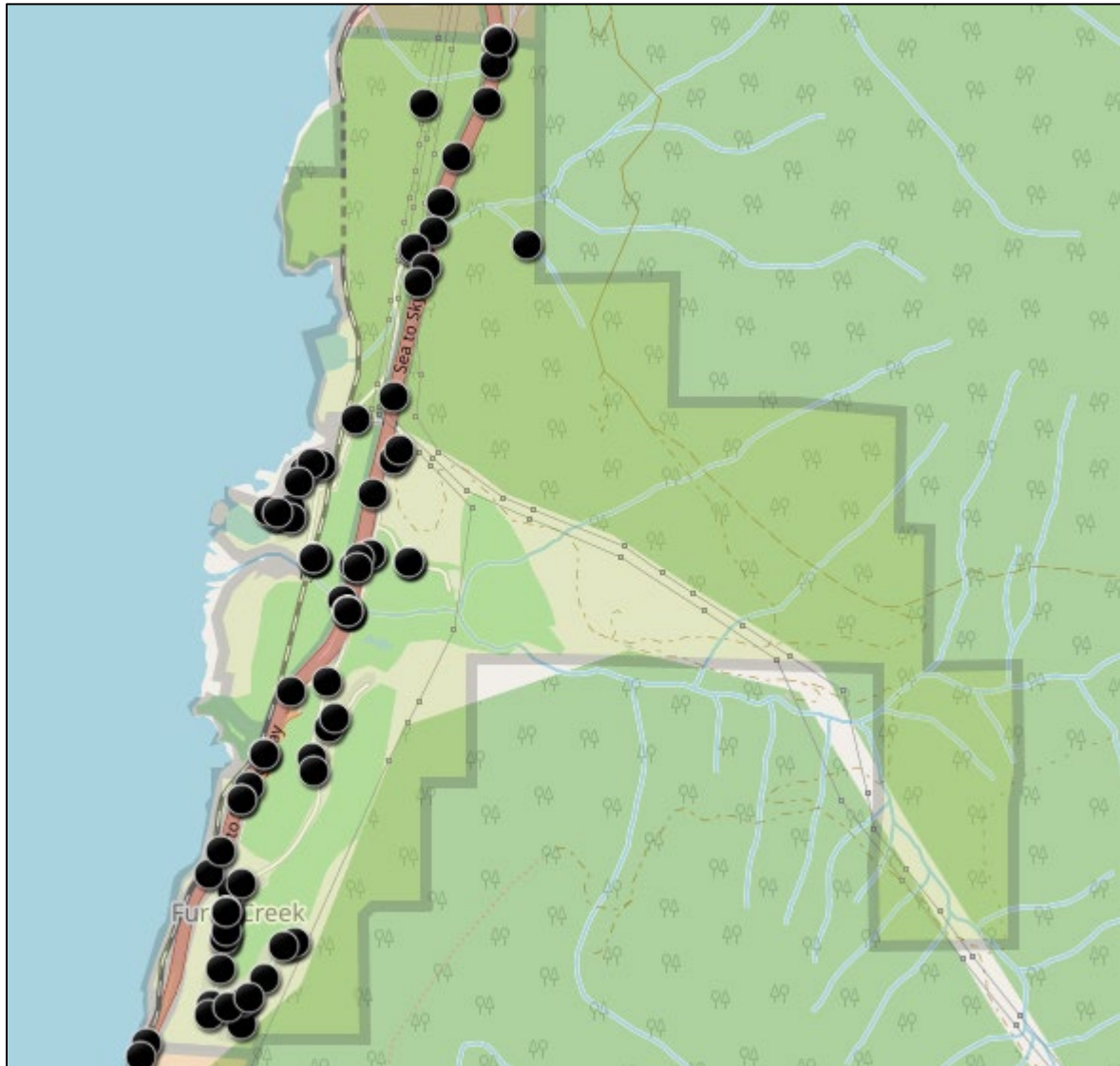


Figure 8: BBVFD Responses in Furry Creek

Porteau Cove

Responses to the current serviced portion of Porteau Cove, as defined in the bylaw, are shown in Figure 9. The largest number of these are MVI or FMR responses.



Figure 9: BBVFD Responses in Porteau Cove

Response Time

The NFPA provides a model for analyzing each of the steps from the time a fire emergency is discovered until the arrival of fire crews and control and mitigation of the event (Figure 10).

As the Department develops a plan to respond to the planned new developments, two key issues will be the travel distance from each fire hall, and the time it takes staffed units to arrive at a reported fire within Britannia Beach as well as Furry Creek and, in the future, potentially to Porteau Cove.

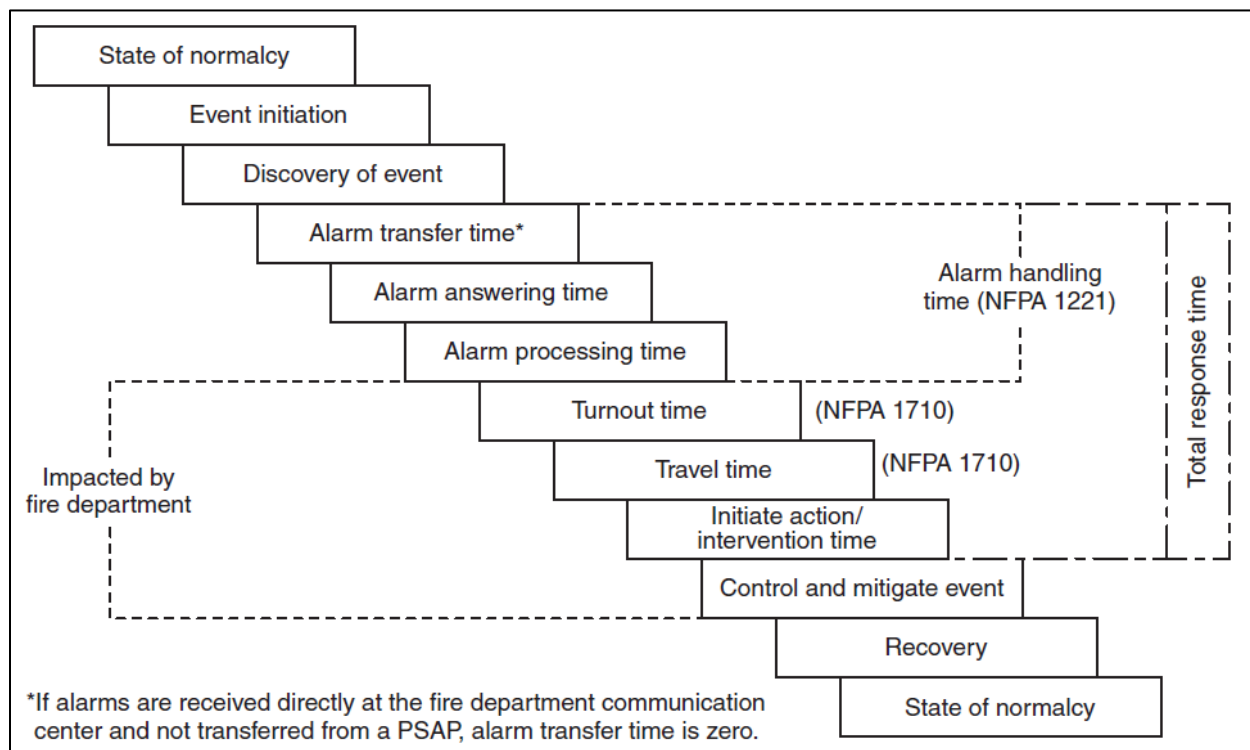


Figure 10: NFPA Fire Response Model.¹⁴

The Department's CAD system provides many of the required time stamps for this model. One caution however is that the following analysis is based on a very small sample and for the following events, not all times were fully recorded.

For a volunteer fire department like BBVFD there are two parts to the response: their turnout time (which comprises the time it takes the crew to respond to the hall, don their gear and roll a truck) and their travel time, both of which are identified in Figure 10. The turnout time although it may vary based on crew availability, should be generally the same for all responses regardless of where they occur, but the travel time will increase as a function of distance.

¹⁴ NFPA 1710, 2020 edition, page 23. Note that this figure comes from NFPA 1710, which is actually the standard applicable to career departments. The conceptual model is the same for volunteer and paid-on-call departments, though the expected response times are different.

Furry Creek

The Department responded to two reported structure fires at 698 Howe Sound Drive in Furry Creek in the past five years. Table 4 shows the calculation of the time to travel from the fire hall in Britannia Beach to this location.

Table 4: Turnout Time, Travel Time and Total Response Time for two Structure Fires in Furry Creek.

Date	Dispatch @Time	Enroute @Time	Time to Turnout	Arrived @Time	Time to Travel	Time to Turnout and Arrive
22 August 2015	13:07:18	13:14:01	0:06:43	13:20:13	0:06:12	0:12:55
5 June 2018	10:47:57	10:55:09	0:07:12	11:04:27	0:09:18	0:16:30
Average			0:06:58		0:07:45	0:14:42

Proposed Developments

As noted above, two areas within the BBVFD response area are being actively developed, while a third area is slated for development. In all three cases, there will be a mix of residential and commercial properties, and in the two active projects, significant high-rise development. The projects at Britannia Beach (Tiger Bay) and at Furry Creek (Fine Peace) are both aiming for construction in the near future subject to approvals from the SLRD. The third potential development by Concord Pacific, is located around Porteau Cove and the benchlands above the highway. There has been some advanced conceptual planning, but this development is not currently in front of the SLRD for consideration.

The following section provides additional detail on the developments planned for the three areas. One of the challenges these developments present relates to the linearity of the total potential response area which spans nearly 20 kilometres from the boundary with Squamish in the north to the border with Metro in the south. Highway access can be challenging, and highway blockages are not uncommon, which add to the actual travel distances or potential travel times for an emergency response.

The linear nature of the coverage area is shown in Figure 11. For the purposes of the SLRD's long-term planning, it includes the Porteau development property, even though that project is not currently at the development permit stage. Ultimately, the Department's response model will need to include these lands as well.

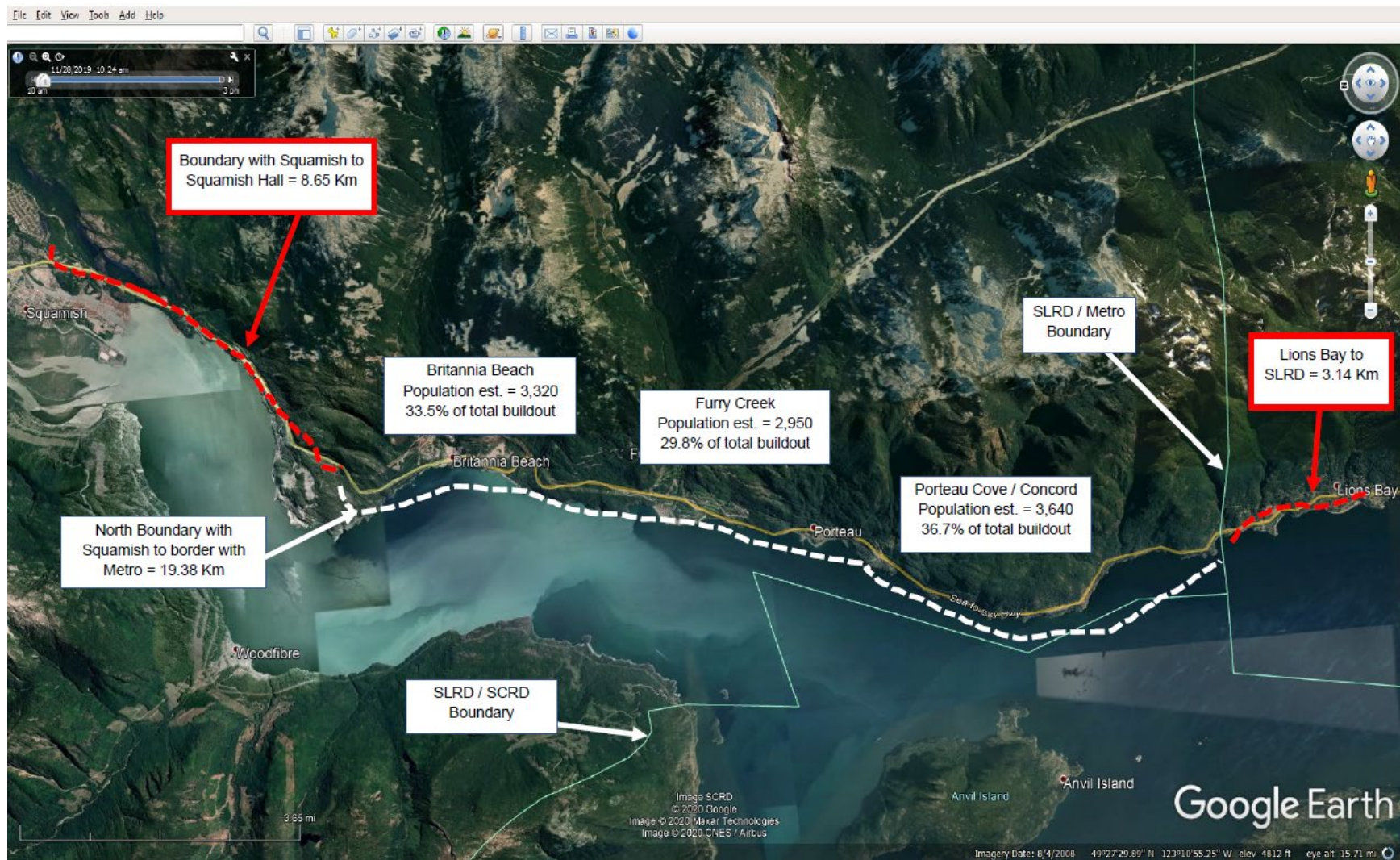


Figure 11: Total Potential Response Area for the BBVFD.

The requirement for a second fire hall at Furry Creek is examined at several points in this document and relates, in part at least, to the Fire Underwriters' requirement for multi-family and commercial structures to be no more than five kilometres from a recognized fire hall. This issue is illustrated in Figure 12 which shows the travel distance from the Britannia Beach fire hall to Furry Creek is 6.1 kilometres. Indeed, this problem of travel distance has already arisen for property owners at Furry Creek. Although the Department is rated by the Fire Underwriters for commercial properties as "Public Fire Protection Classification 8" (which means it provides some measure of protection to these such properties), strata developments in Furry Creek do not receive the benefit of such classification – and the benefit of lower insurance costs – since they are more than five kilometres from the fire hall in Britannia Beach. The addition of a second hall at Furry Creek will address this problem.

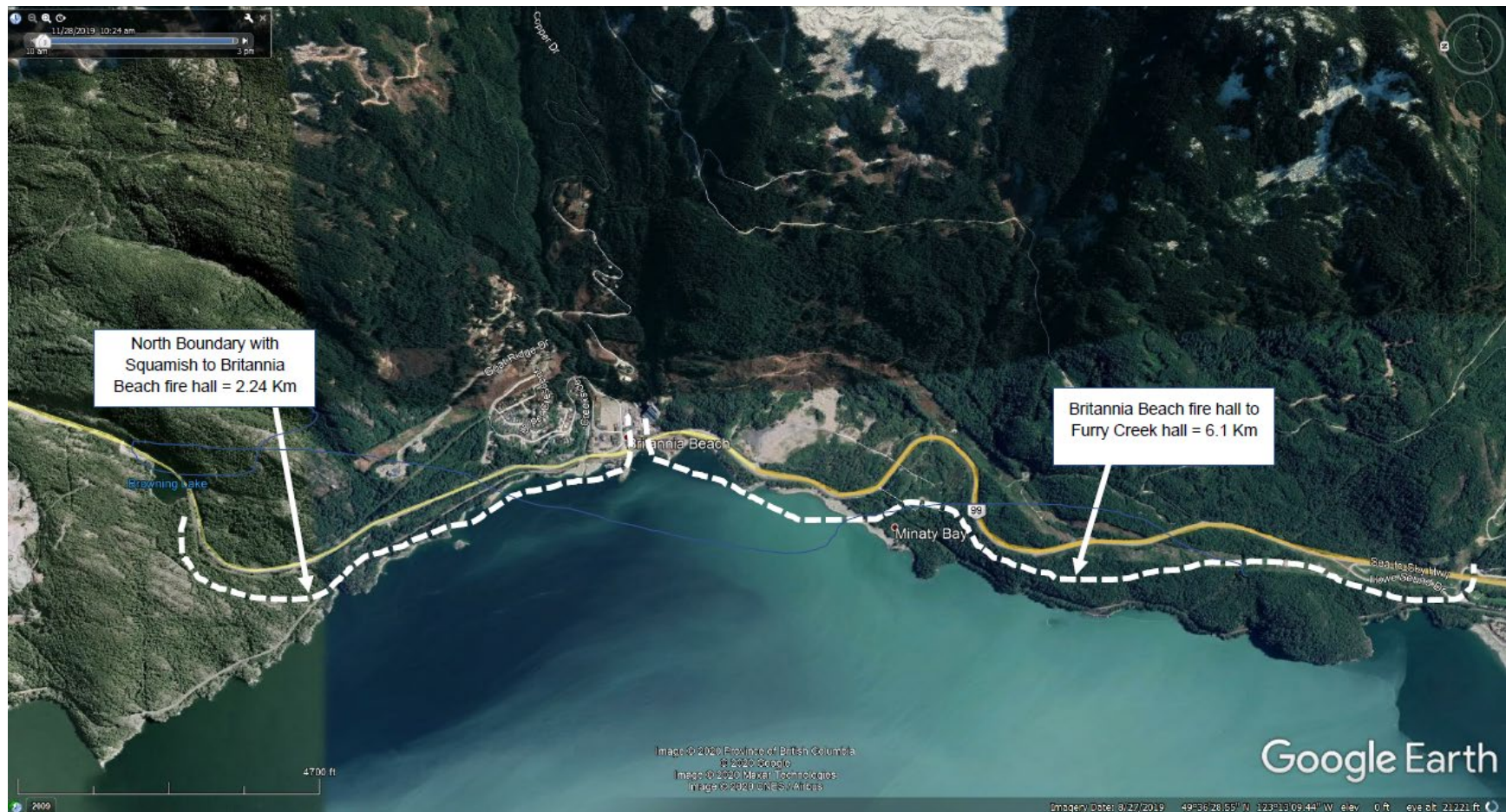


Figure 12: Britannia Beach Fire Hall to Furry Creek; 6.1 Km

When the Porteau property moves to an active development phase, a third fire hall in that area would be advisable. As Figure 13 shows, the distance from the proposed Furry Creek fire hall to the entrance to the Porteau development is 7.2 kilometres. This figure also shows the highway access challenge – a response from the proposed new hall at Furry Creek has to backtrack significantly to get access to Highway 99 south.



Figure 13: Proposed Furry Creek Fire Hall to Highway 99 overpass at Porteau

Britannia Beach: Tiger Bay

Proposals for the developments at Britannia Beach by Tiger Bay are being reviewed by the SLRD which may grant approval for these to proceed. The timeline provided by the developer is discussed in this report and includes a proposed build out that may take 25 years for completion. The recommendations that follow for the Department area based on the information provided to the SLRD.

Furry Creek: Fine Peace

The proponent for the further development at Furry Creek has provided a timeline that extends for more than 10 years based on approvals that are being sought. The developer has agreed to provide a site for a fire hall and the location and overall size for this is being actively discussed. The developments in this area may at full buildout include structures up to 15 stories and the recommendations for the BBVFD are based on the information provided to the SLRD by the developer.

Porteau Cove: Concord Pacific

Development of proposed site at Porteau contemplates the largest population increase of the three developments being proposed. Our understanding of this is based on the information provided and the timeline for this is uncertain. Regardless at the point at which development proposals for this area are being considered they will require an additional fire hall for the reasons discussed in this report, primarily related to the requirements of the Fire Underwriters.

Regulatory Issues

Department Legal Structure

Service Establishment Bylaw

In 2006, the SLRD established a fire protection service area spanning the distance from the boundary with Squamish in the north, to the boundary with Metro in the south, pursuant to *Howe Sound East Fire Protection Service Establishment Bylaw No. 1032-2006* ("Bylaw No. 1032"). This bylaw:

- set out the purpose of the service being established (section 1);
- set the boundaries of the service area (section 2); and
- provided for the means of recovering the cost of the service and set a maximum requisition, being the greater of \$196,400 annually, or \$0.919/\$1,000 of the net taxable value of land and improvements within the service area (sections 3 and 4).

In 2018, Bylaw No. 1032 was amended to remove certain Provincially-owned or undeveloped privately-owned properties in the southern part of the service area.¹⁵ The removal of these properties resulted in the creation of a non-contiguous response zone: the Department's main response zone now ends at the Porteau Road overpass, except for one privately-owned parcel some five kilometres further south towards Lion's Bay.

The reduced service area covers both the Tiger Bay and Fine Peace development properties. When Concord Pacific moves to develop its Porteau Cove properties, however, Bylaw No. 1032 will need to be amended to add these lands into the Department's authorized response zone.

One issue for consideration in Bylaw No. 1032 is the rather narrow framing of the service that has been authorized under section 1, which reads as follows:

Service

1. The service established by this Bylaw is the Howe Sound East Fire Protection Service (the "Service") for the purpose of operating a fire protection service identified in within the service area established by this bylaw.

The Department, as is increasingly typical, provides a broader range of emergency response services than simply fire protection. In 2015, it moved to provide both rescue and extrication services for MVIs, as well as a level of FMR services. In 2018, a new operational bylaw (discussed below) was passed that set out a wide range of emergency response services for the Department. As such, it may be worth revising the service description in section 1 of Bylaw

¹⁵ SLRD, *Howe Sound East Fire Protection Service Establishment Bylaw No. 1032-2006, Amendment Bylaw No. 1543-2017*. Although dated 2017, the amendment was not passed until 2018.

No. 1032 to read “fire protection and other emergency response services,” or some similar, broader formulation, to reflect the broadening of the Department’s operational mandate.

Operational Bylaw

Structure fire protection is an optional service created by local governments. As such, unlike police and ambulance, which are established under and/or operate pursuant to provincial statutes and have a uniform range of powers across the province, a fire department only has the power and authority granted to it under the local bylaw which creates the service and defines its operational responsibilities. Outside of its operating jurisdiction – which, in the case of a service established by a regional district, is the boundaries of the department’s local service area – a fire department has no specific authority to act at or to respond to an incident. Care must be taken, therefore, to ensure that the Department has the full range of powers needed to respond effectively to incidents within its jurisdiction. Where it is responding outside of its ordinary jurisdiction, express consideration should be given to the source of the Department’s powers to respond to and operate at an incident – whether in a mutual or automatic aid agreement, under a task number from Emergency Management BC, or in support of another emergency response agency, such as the provincial Wildfire Service.

Similarly, there is no standard range of services defined for a fire department. A department is authorized to provide only those services which are stipulated in its service establishment and operational bylaws. Given that fire departments are the only “all hazards” response agency available to local government, we recommend that both the grant of powers and authorization to respond to incidents be very broadly cast, but that their exercise be made subject to training and the availability of necessary personnel and equipment.

The SLRD has crafted an operational and administrative bylaw – Bylaw No. 1561 – covering its two, regional district-operated departments. Bylaw No. 1561 is of recent vintage and shows careful thought and attention to the authorization of emergency response services, the granting of powers and authority to the two fire departments, the management of the departments, the fire chiefs’ respective responsibilities, the role to be played by the SLRD Chief Administrative Officer (“CAO”) and the related reporting lines.

In reviewing the Department’s responses, an issue that should be examined is the management of MVIs on Highway 99, between the border with Metro and the recently truncated southern boundary of the Department’s service area. Unless the CAO is specifically authorizing each response along this portion of Highway 99, or the Department is obtaining task numbers from EMBC, it is not authorized to respond to such calls under sections 8.1 and 8.2 of Bylaw No. 1561. We would recommend that the CAO and the Department review this situation and develop an appropriate policy for such responses.

In relation to the expansion of the Department that is contemplated by this report, it will be necessary to revise section 4.1 of Bylaw No. 1561, which specifies that the Department is operating at the Exterior Operations service level. In general, we recommend that local governments specify in their bylaws that the service level will be set by council or regional district board policy (as the case may be). In this way, it makes it easier to change the service

level if required; it also allows the board to set out a more nuanced and detailed approach to Playbook compliance.

Bylaw No. 1561 contemplates, in s. 6.6(i), that an SLRD department may be authorized, by separate bylaw, to undertake fire inspections as contemplated by sections 26 and 36 of the *Fire Services Act*. Again, as part of upgrading the Department to address the increased risks that will be posed by the Tiger Bay and Fine Peace developments, we recommend that the SLRD plan to bring in such a fire inspection bylaw, including pre-incident planning, as part of this process.

Fire Prevention

Fire Inspections

Under the *Fire Services Act*, regional districts are not required to provide for a regular system of inspection of public buildings – though, this situation may be changing under the *Fire Safety Act* (see discussion, below). Instead, such inspection systems are currently optional. Nevertheless, as noted above, we recommend that the SLRD bring in a fire inspection bylaw. The rationale is four-fold:

1. The new developments will pose materially larger and more significant risks than currently exist. Fire safety inspections are an important means to mitigate those risks.
2. The Department will need to conduct pre-incident planning of the larger risks in its service area to ensure that its responses are both effective and safe. Departments which operate at the Interior Operations service level are *required* to undertake such planning, if they intend to enter structures which are larger than an ordinary residential dwelling. For Departments operating at the Full Service level, such pre-incident planning is best practice. This planning is best accomplished and updated through the regular fire inspection process.
3. A regular system of fire inspections will improve the Department's scoring in the relevant portions of the Fire Underwriters' review, as will the development of a comprehensive set of pre-incident plans.
4. Fire safety inspections may, in any event, become mandatory for regional districts under revisions being proposed to the *Fire Safety Act*.

When establishing an inspection system, the SLRD will need to ensure that it complies with the *Fire Services Act* and it can use the municipal requirements as guidance for that purpose. Sections 26 and 36 of the *Fire Services Act* require a "regular system of inspections" by municipalities for hotels, public buildings and "buildings" (as defined)¹⁶ and the phrase "regular system" is not defined in the statute. In general, it is open to a municipality to define what constitutes such a system, and to determine the appropriate inspection frequency for different

¹⁶ There is significant overlap between the two sections. The term "building" in section 36 includes a "hotel, public building, church, theatre, hall or other building used as a place of public assembly."

classes and risks within its boundaries. Initial advice as to the recommended frequency of inspections provided by the Office of the Fire Commissioner (the “OFC”) in the early 1990s was never met.¹⁷ In our experience, most jurisdictions have generally adopted an annual inspection cycle, rather than the more frequent one previously recommended by the OFC. This frequency is then occasionally modified to deal with local circumstances: known high-risk buildings or undertakings may be slated for more frequent inspections while, in some cases, lower risk properties are inspected on a more extended cycle. For example, the City of Prince George, for its “standard risks” uses an annual, biennial and triennial inspection cycle depending on risk.¹⁸ For its high-risk sites (e.g., major industrial, refining or chemical operations) it increases the frequency. Overall, however, the standard that seems to be applied more generally by local governments is to target annual inspections of all inspectable properties.

The OFC’s 2014 training materials for Local Area Fire Commissioners (“LAFCs”) seems to endorse this approach: these materials define a regular system of inspections as being:¹⁹

“Annual” or as recommended by the local government and by the frequency of the inspection policy.

In 2015, the OFC endorsed and collaborated on the creation of a guide by the Fire Inspection and Prevention LAFC Inspection Working Group Sub-Group, entitled: *BC Fire Services Act: Regular System of Inspections – Considerations for Development* (January 2015) (the “2015 Guide”).²⁰ The 2015 Guide did not set a specific frequency schedule. Rather it noted that the local government needed to engage in a risk management exercise and determine inspection frequency based on a series of factors, including:²¹

- building classification;
- local conditions and circumstances;
- age, condition and level of compliance; and
- staffing levels within the fire prevention division.

¹⁷ Office of the Fire Commissioner, Interpretive Guide: Criteria for Determining Frequency of Inspections (July 1992) (the “Guide”). The Guide was reviewed in a report Abbotsford Fire Department in the mid-1990s, which found none of the benchmark municipalities was following the OFC recommendations. DFC Lawrie, City of Abbotsford Fire Department, Report to Mayor and Council, “Fire Inspection Frequency” (19 Feb. 1996), at Appendix C. Available at: <https://abbotsford.civicweb.net/document/31173> (accessed on 17 Aug. 2020). The Lawrie report attaches the OFC’s 1992 Guide.

¹⁸ The risk assessment has two components; general risk which is principally driven by the building classification and specific risk which are factors that are unique to the location as identified based on experience and local knowledge (e.g., previous compliance issues, building age, etc.).

¹⁹ OFC, *LAFC Training Program: Basic Fundamentals for Inspection* v.2 (Feb 2014) at p. 11. Available at: https://www2.gov.bc.ca/LAFC_Training_Guide. Accessed on 17 Aug. 2020.

²⁰ Available at: https://www2.gov.bc.ca/Inspection_Guide. Accessed on 17 Aug. 2020.

²¹ 2015 Guide, at pp. 18 – 19.

The 2015 Guide suggested that some inspection frequencies could be extended if a self-assessment system was also incorporated. It noted, however, that a self-assessment system, on its own, was not thought to meet the requirements of the *Fire Services Act*.²² The 2015 Guide recommended that local governments adopt a risk-based approach to setting inspection frequency, a view that is fully reflected in the new *Fire Safety Act*, as will be discussed further, below.

The 2015 Guide also reviewed the need to ensure that individuals charged with carrying out inspections are properly trained for their roles. For persons fulfilling the LAFC role, as a minimum, completion of the OFC's training program should be required. In relation to inspectors, the 2015 Guide states:²³

They [inspectors] should be knowledgeable in:

- i. The relevant sections of the *Fire Services Act*
- ii. The BC Fire Code Regulation and the BC Fire Code
- iii. The Local Government's related bylaws and enforcement mechanism
- iv. The basics of conducting a Code compliance inspection[.]

Fire Investigations

Under the *Fire Services Act*, fire investigations are required to be carried out and reported on by LAFCs. A regional district may also provide separately, by bylaw, for fire investigations.²⁴ Section 9 of the *Fire Services Act* sets out the obligations of LAFCs to conduct fire investigations and report on same to the Fire Commissioner.

Broad powers of entry to conduct investigations are provided for in subsection 10(1), and the right to require the production of information by owners, occupiers and residents or employees at an affected site,²⁵ is covered by subsection 11(2). Under section 13, a preliminary report of fires of a "suspicious origin" must be made to the Fire Commissioner by the LAFC (and by any interested insurer) containing certain prescribed details and information, in addition to the report required under section 9.

The fire investigation is undertaken to identify the cause, nature and circumstances of the fire to ascertain if the fire was due to accident, negligence or design.²⁶ The specific information sought

²² 2015 Guide at p. 19 and Appendix B. On a self-assessment system alone not meeting *Fire Services Act* requirements, see p. 8 of the 2015 Guide.

²³ 2015 Guide, at p. 20.

²⁴ *Local Government Act*, s. 303(1)(d) permits regional districts to make bylaws that "deal with any matter within the scope of the *Fire Services Act* in a manner not contrary to that Act or the regulations under it.

²⁵ Sections 10 and 11 cover fires at "a building, premises, motor vehicle, vessel or railway rolling stock."

²⁶ Section 9 identifies the purposes of the investigation.

by an investigation is laid out in the OFC fire report that is required to be submitted. Examples of reportable fire includes:²⁷

Table 5: OFC Reportable Fire Types

Structure Fires	Vehicle Fires	Outdoor Fires
Buildings	Cars and trucks	Dumpsters
Piers	Trains, boats, planes	Playground equipment
Decks and Patios	All-terrain vehicles	Telephone/hydro poles
Parkades and covered parking lots	Recreational vehicles	Grass/bark mulch

Bylaw No. 1561 is silent on fire investigations (though it prohibits a person from interfering with a fire-cause investigation). The Fire Chief is made responsible for the day-to-day operation of the Department and is designated for appointment by the Fire Commissioner as the LAFC for the jurisdiction. As such, the Fire Chief has the obligation to undertake investigations of fires within the fire protection area and report on same to the OFC. The Fire Chief noted that that he currently carries out and reports on basic investigations, but in situations involving a complex fire, he requests assistance from the OFC.

As the Department expands and its responsibilities increase on the fire prevention side, it would be advisable to have trained fire prevention staff – members skilled in both inspections and investigations – take primary responsibility for fire investigation duties. In such situations additional LAFC appointments can be requested by the local government.

Pre-Incident Planning

As discussed in the Playbook section below, once the Department transitions from the Exterior Operations service level to Interior Operations, there is a requirement for preplans to be completed before interior firefighting activity is permitted in structures that are larger or more complex than a single family dwelling or other “simple” structure.

If the Department brings a fire inspection program into effect as described above, the preplans could be compiled as part of the inspection process. Absent a fire inspection program, a process will need to be set up to identify the applicable buildings and create corresponding preplans. There are commercial products available for creating preplans, however other fire departments may also be willing to share their approach and tools with the Department to minimize the cost involved. The Department will need to craft an operational guideline to

²⁷ Office of the Fire Commissioner, “Reportable Fire Guidelines,” at: <https://www2.gov.bc.ca/gov/content/safety/emergency-preparedness-response-recovery/fire-safety/fire-reporting/reportable-fires>. Accessed 28 February 2020.

identify the preplan program inclusive of provisions to take advantage of opportunities for updates, such as during inspections or as part of any incident call outs.

New Fire Safety Act

The *Fire Services Act* is slated for replacement. The new *Fire Safety Act* received third reading in May 2016, but it has not yet come into force. The OFC is in the process of completing the regulations and policies which are needed before the statute can come into effect. More significantly, in a 2018 letter from the Minister of Public Safety and Solicitor General to the Union of BC Municipalities, the Province announced that it was going to amend this new statute in a way that will materially impact the obligations of regional districts, by creating an obligation to conduct fire safety inspections on the same basis as municipalities.²⁸ These potential amendments, and on-going discussions between the Province and regional districts regarding their implications, have delayed the statute from coming into effect. Our understanding from the OFC is that the necessary amendments are unlikely to be passed before 2022.

However, once the new act comes into force, it will materially affect how fire inspection obligations must be met, as well as fire investigations.

This section of the report examines the effect of the new *Fire Safety Act* and its implications for the SLRD and the Department. When the new *Fire Safety Act* comes into effect, it will replace the existing *Fire Services Act*. At a high level, this new statute impacts the following principal matters relevant to the SLRD and the Department:²⁹

- the fire inspection regime applicable to public buildings;
- fire investigations; and
- the powers exercised by fire chiefs and local governments.

Fire Inspections

Under the new *Fire Safety Act*, the existing obligation to operate a regular system of inspections is replaced by the obligation to establish a risk-based compliance monitoring system for public buildings which encompasses:

- fire safety inspections; and
- fire safety assessments.³⁰

²⁸ Letter, Farnworth (Minister of Public Safety and Solicitor General) to Booth (President, Union of BC Municipalities), 30 July 2018.

²⁹ For the purposes of this section, we are assuming that the SLRD either implements a fire inspection bylaw or is required to undertake fire inspections under the revised *Fire Safety Act*.

³⁰ *Fire Safety Act*, s. 20. The term “public buildings” is defined in s. 1.

Following a transition period, “fire inspectors” will need to meet the training and proficiency requirements specified by the Fire Commissioner.³¹ Those requirements, which are expected to be similar in format to the Playbook, have not yet been issued. However, these new training requirements will potentially impact the training of the Department’s officers and members designated as fire inspectors, who will have to meet the new standards.

The new provisions mean that the Department will have to conduct risk assessments of public buildings within its service area. Those assessments will need to comply with the (yet to be issued) regulations under the *Fire Safety Act*.³² An inspection regime will then need to be developed based on the risk assessments that are conducted. Conceptually, the *Fire Safety Act* moves away from the existing “regular” inspection requirements, where, in practice most jurisdictions seek to inspect all properties annually, and heads towards a more flexible regime, where inspection frequency is based principally on risk. Under this approach, higher hazard or non-compliant properties should be subject to more frequent inspections, while lower risk, compliant properties can be inspected less frequently (perhaps coupled with intervening self-assessments by the owners at specified intervals).

The new *Fire Safety Act* also introduces the concept of a “fire safety assessment,” which is the self-inspection of a property by the owner. As noted above, under the existing *Fire Services Act*, there has been some uncertainty about whether self-inspection systems complied with the statutory requirements.³³ That issue is now laid to rest. However, it will be up to the SLRD to determine which public buildings are to be permitted or required to conduct self-assessments, presumably as part of the overall risk analysis that must be conducted. The new self-assessment by owners will have to be conducted “in the form and manner required by the Fire Commissioner” under the new statute.³⁴ It is expected that the Fire Commissioner will issue policy or forms covering fire safety assessments, though these have not yet been released.

Section 10 of the *Fire Safety Act* grants various powers to fire inspectors to enter premises,³⁵ conduct their inspection (including testing and taking of samples, etc.), and to require the production of records related to the premises by the owner or occupier. Section 11 empowers a fire inspector to issue orders requiring an owner bring the property into compliance with the *Fire Safety Act* and regulations (which regulations will include the *Fire Code*).

If the SLRD implements a fire inspection regime before the new *Fire Safety Act* comes into effect, we would recommend that the Department conduct a risk assessment process, since that

³¹ *Fire Safety Act*, s. 8(2). The transition period is provided for in s. 53.

³² *Fire Safety Act*, s. 20(1)(b).

³³ For opposing views, see the 2015 Guide at p. 8 (suggesting such a system, on its own, is not compliant with the *Fire Services Act*); versus: L. Staples, Q.C., “Opinion letter to Fire Chiefs’ Association of British Columbia,” dated 30 Aug. 2012, which holds that such a system of self-inspections can be implemented in compliance with the existing *Fire Services Act* requirements.

³⁴ *Fire Safety Act*, s. 21(1).

³⁵ The power is specifically limited in s. 10(2) to exclude private dwellings, unless a warrant has been obtained.

is going to become a requirement in the foreseeable future. It would be useful to conduct detailed assessments where location, age, condition, use and site-specific features (e.g., sprinkler coverage), that would suggest that the building or premises present a higher risk than otherwise would be expected from the general building classification alone.

Under subsections 20(2) and (3) of the *Fire Safety Act*, the SLRD may, by bylaw, charge “a reasonable fee” for conducting a fire safety inspection required by the new Act. When crafting a fire inspection bylaw, therefore, provision for levying such charges should be contemplated. Subsection 20(4) specifies the criteria which may be applied when setting such fee.

Given that currently there is no formal fire inspection process in place, the Department will not be able to rely on any previous assessments of buildings to help determine risk levels for inspection purposes. As such, it will need to undertake risk assessments of buildings in its service area to develop an inspection program to both meet its needs related to the coming development and in anticipation of the *Fire Safety Act*. For the newer construction, this risk assessment can be made part of the on-going consultation process with the developers. For existing building stock, the Department may need to retain outside assistance to carry out such reviews, and possibly some assistance with conducting the initial fire inspections themselves.

It should be noted that there is value in having the Department and its members ultimately made responsible for undertaking fire safety inspections, rather than indefinitely contracting this role out to a third party. First, it provides an opportunity for Department members and officers to conduct regular familiarization tours of the more complex buildings to which they may have to respond. Second, it provides a ready pathway (discussed more below) that will enable the Department to update pre-incident plans for responding to a fire event at a public building. As noted above, under the Playbook, pre-incident plans are necessary for an Interior Operations service level department to undertake interior attacks or primary search and rescue, in a building or structure that is larger or more complex than an ordinary residential building. Finally, it enables the Department to undertake pro-active fire prevention education activities within the community. As such, the SLRD, in discussion with Department members and officers, should craft an approach that sees this role fulfilled by the Department. Given the volunteer nature of the Department, this should be treated as compensable activity for the participating officers and members, which can be funded (at least in part) through the charging of a fee for the service.

Fire Investigations

While an argument can be made that LAFCs (and not local government *per se*) are currently responsible for fire investigations and reporting, the new *Fire Safety Act* makes it clear that the obligation will now fall directly on the “local authority” (which includes a municipality). The requirements relating to fire investigations are set out in Part 7 of the *Fire Safety Act* (ss. 22 – 27). As with fire inspectors, a local authority:³⁶

³⁶ *Fire Safety Act*, s. 23(1).

must designate in writing persons or a class of persons as fire investigators to conduct fire investigations.

Following a transition period, fire investigators must meet the training standards which are to be specified by the Fire Commissioner.³⁷ Those standards have not yet been promulgated. These new training requirements will likely impact the Department's officers or its fire prevention staff, who most likely are the ones who will be expected to undertake the investigations.

Under section 25 of the *Fire Safety Act*, each local authority is required to commence a fire investigation within five days of learning of a fire that has destroyed or damaged property or resulted in death or injury. The investigation must examine the "cause, origin and circumstances" of the fire. The facts ascertained about the cause, origins and circumstances of the fire must then be submitted to the OFC within 30 days after such fire.³⁸

Fire investigators are granted broad powers of entry onto property or premises for the purposes of conducting a fire investigation, and to remove a record or thing, conduct testing, take samples and make such records, as required.³⁹

Powers and Authority

Under the *Fire Services Act*, powers and authority are granted principally through the mechanism of appointing fire chiefs (and others) as LAFCs.⁴⁰ The role of LAFC, however, is being abolished.⁴¹ In place of the powers granted to LAFCs, the new statute:

- grants a fire chief (or designate) the power to order a tactical evacuation where he or she "believes that there is an immediate threat to life due to a fire or explosion";⁴² and
- deems "fire chiefs," fire investigators and fire inspectors to be peace officers for the purposes of the new act.

In addition, as noted above, broad powers are granted to fire investigators conducting investigations, and to fire inspectors conducting inspections. Additionally, local authorities are granted the power to order a "preventive evacuation" where the local authority "believes that

³⁷ *Fire Safety Act* s. 23(2); the transition period is provided for in s. 53.

³⁸ It is unclear in the statute whether the report must be submitted 30 days after the date of the fire, or 30 days after completion of the investigation of the fire.

³⁹ *Fire Safety Act*, s. 27.

⁴⁰ *Fire Services Act*, s. 6.

⁴¹ Under s. 55 of the *Fire Safety Act*, Local Assistants are required to return their badges within three months of the new statute coming into force.

⁴² *Fire Safety Act*, s. 13.

conditions exist on or in the premises that fire on or in the premises would endanger life.”⁴³ Each of these new powers should be contemplated in any updated bylaw.

OFC Playbook

Introduction and Context: Operational Risks

The proper training of firefighters and officers is critical to the safe and effective delivery of emergency response services by the Department. In many respects, the risks faced by volunteer departments in the province are as great or greater than those of the career departments: volunteer members typically are less experienced, as they respond to fewer incidents; they are usually later to an incident than a career response, meaning a fire has progressed further, and is more difficult to manage; they usually have fewer firefighters and apparatus at an incident; and fire prevention and fire inspection activities are typically more limited. While volunteer departments, on the whole, respond to fewer structure fires than most of their larger career or composite urban counterparts, the risks they face at any given incident are probably greater overall as a result of the differences noted.

The nature of modern construction techniques has amplified the risks faced by firefighters. Lightweight construction components and contents made of composites, synthetics and other unusual fuels, cause fires to burn hotter, faster and with less predictability, creating a much more volatile fire environment than in the past. Although firefighters are now better equipped, fires today spread faster and pose a greater risk than those faced in the 1970s and 1980s. Having recognized this, the fire service in general is now placing a much greater emphasis on firefighter safety, with particular focus on interior operations, and seeking to reduce the degree of risk to which firefighters are exposed. Unless the situation presents firefighters with an immediate life safety issue (a savable life), in general firefighters should not be subjected to the high degree of risk involved in aggressive interior operations to save a single structure or its contents. With a good understanding of the appropriate fire ground strategies and tactics, combined with the necessary training, structure fires can usually be suppressed safely and effectively using an exterior, defensive mode of operations that materially reduces risks to firefighters.

Aggressive interior operations, such as fire attacks and primary searches, require firefighters to enter an extremely hazardous environment. These types of operations expose firefighters to adverse fire events such as flashover, smoke explosion or backdraft, as well as to a variety of other hazards. As such, they pose the most significant risk to firefighters during fire suppression operations, and require that the Department, and its Authority Having Jurisdiction (“AHJ”), be certain that members and officers are properly trained to manage those risks.

We also would note that the geography of the service area poses some unique challenges. Even assuming that turnout is quick, the long linear geography and, in many places, steep inclines, will materially delay the response. Response delays caused by travel time issues

⁴³ On fire inspectors’ powers, see ss. 10 and 11; on fire investigators’ powers, see s. 26. The power of a “local authority” to order a preventive evacuation is set out in s. 14 of the *Fire Safety Act*.

means that fires will be more advanced when crews arrive, and therefore more difficult and dangerous to fight. The topography will also pose significant access challenges for many buildings in the new developments. These additional factors make good general training crucial, and careful pre-planning essential, to ensure that the Department can operate safely at structure the fires it is likely to encounter.

Service Levels and Applicable Training Standards

In 2014, the OFC issued a new training standard for the fire service. This new standard, referred to as the Playbook, was issued pursuant to and approved by the Minister of Justice under paragraph 3(3)(b) of the *Fire Services Act*. The Playbook replaces the previous minister's order on training and is binding on all "fire services personnel" in the province.⁴⁴ The previous minister's order, MO-368 (December 2002), has been rescinded. A second edition of the Playbook was released, with some material updates and clarifications, in May 2015.⁴⁵ The Playbook is currently under active revision, and an updated version is likely to be released later this year.

The Playbook contemplates that a fire department may deliver one of three possible levels of service, and establishes the principal minimum training required to qualify for each level of service:

Exterior Operations – includes fire fighting activities restricted to the control and/or extinguishment of fire from an external position to the building or object; where a fire department does not undertake interior attack or rescue operations on a fire-involved structure or object, or operate in an environment that is "immediately dangerous to life and health".

Interior Operations – where a fire department, in appropriate circumstances, will enter a fire-involved structure or object to undertake fire suppression activities or conduct rescue operations. Interior operations by these departments are generally to be limited to smaller structures, single family dwellings and vehicles, except where specific hazard assessments and planning have been undertaken in respect of more complex risks.

Full-Service – a full-service department is equipped, staffed and trained to provide a full spectrum of fire services by firefighters and fire officers who are trained to the competencies outlined in the NFPA 1001 FF-II and relevant NFPA 1021 Fire Officer⁴⁶ standards.

⁴⁴ As that term is defined in the *Fire Services Act* (B.C.). The Playbook is not binding on fire suppression operations undertaken by Wildfire Services under the *Wildfire Act* (B.C.).

⁴⁵ The Playbook requirements for each level of service are shown in Appendix 2.

⁴⁶ National Fire Protection Association, *NFPA 1021: Standard for Fire Officer Professional Qualification* (2020 edition).

One of the critical requirements in the Playbook is that fire departments need to maintain individualized records of each member's training and qualifications, which show compliance with the minimum and other applicable training standards:⁴⁷

Assessments and evaluations of Competencies can be carried out internally by the AHJ so long as the evaluation instruments follow the criteria of this Playbook (and other applicable NFPA Standards) and that detailed records of firefighter training and evaluation are maintained. [...]

It is the responsibility of all fire departments/AHJs to be able to accurately identify record, edit and report out on a complete list of training records for each individual firefighter including specific training subjects covered at each training session. All training records must be kept in accordance with the requirements of the *Workers Compensation Act* (B.C.) and related regulations, and any other regulatory requirements.

A new aspect introduced by the Playbook is an explicit requirement that the AHJ over a fire department expressly set the level of service that is expected to be provided by the department. The training, organization, staffing, equipment and apparatus required to support the chosen level of service will all be impacted by that determination.

The SLRD is the Department's AHJ and it has set the BBVFD's service level as Exterior Operations.

We believe that the current service level declaration should be reviewed. The Department should aim to move to Interior Operations in the short term (two to three years) and, ultimately, to Full Service. Given the number of additional firefighters required to support service to the proposed developments, as well as moving existing firefighters from the Exterior to Interior level of service, the Department may need a dedicated resource to plan, monitor and supervise the overall training plan to ensure sufficient trained personnel are available at the appropriate benchmarks in the build out.

When considering how to address the question of the declared service level, the SLRD, the Department and its members need to ensure that they have reviewed and considered the training issues identified below.

The Playbook is not yet a complete system: it does not cover all emergency scene functions and responsibilities. One challenge, therefore, is the question of what standards apply to matters not covered by the Playbook itself. Although there are several indications in the Playbook that the NFPA standards are expected to apply to other functions (which was what

⁴⁷ Playbook, pp. 4 and 6. Maintenance of proper training records also is required under the *Workers Compensation Act* and regulations.

was required by the previous Minister's Order on training),⁴⁸ ambiguity now exists as to the standards applicable for a wide range of firefighter training.

Given the requirements of the *Workers Compensation Act* (B.C.) (the "WCA"), which imposes a positive obligation on employers to train workers appropriately, and given that the only recognized standards that exist in North America for the training of fire services personnel are those established by the NFPA, the better approach is to assume that those standards should guide the Department's operations. Should a local government choose to use a different standard (or no standard at all) in relation to the training applicable to other fire service functions, if an incident occurs which relates back to training issues (as happened in the Clearwater case),⁴⁹ that local government will be faced with the unenviable task of justifying the approach that it has taken in circumstances where, *prima facie*, there is evidence of a problem.

As such, when formally implementing the service level standard for the Department, it is recommended that the SLRD also require that NFPA standards form the basis of all training for the operational functions undertaken and emergency services provided by the Department.

Given Department's proposed service mandate, the following is an outline of the standards applicable, in whole or in part, to the Department's operations:

- The Playbook – (relevant service level);
- WCA and the OH&S Regulation (in particular, Part 31);
- NFPA 1001 – Firefighter Level I & II;
- NFPA 1021 – Fire Officer Level I, II or III (as per Department's job requirements);
- NFPA 1041 – *Standard for Fire and Emergency Services Instructor Professional Qualifications* (2019 edition) - Fire Service Instructor I or II (as per Department's job requirements);
- NFPA 1002 – *Standard for Fire Apparatus Driver/Operator Professional Qualifications* (2017 edition), for Emergency Vehicle Drivers and Operators;
- NFPA 1561 - *Standard on Emergency services Incident Management System and Command Safety* (2020 edition); and
- Emergency Medical Services (EMS) – FMR Level III.

⁴⁸ The second edition did not entirely clarify the matter, though it even more clearly suggests that the appropriate standards applicable to matters not yet covered, are those set by the NFPA.

⁴⁹ The death of firefighter Chad Schapansky in Clearwater, BC in 2004 which resulted in a Coroner's report "Judgement of Inquiry into the Death of Chad Jerry Schapansky". This report found that the Clearwater fire department lacked written operational guidelines governing interior attacks; it could also produce no training records for accredited training done by the interior attack team, rapid intervention team or fire officers in charge.

For specialty teams and other hazard responses that may be required, the following standards and training levels are suggested (subject to a review of the Department's service mandate):

- NFPA 1072 – *Standard for Hazardous Materials/Weapons of Mass Destruction Emergency Response Personnel Professional Qualifications* (2017 edition): Hazardous Materials incidents training - awareness (minimum); consider operations or technician level;
- NFPA 1006 *Standard for Technical Rescue Personnel Professional Qualifications* (2017 edition) and NFPA 1670 *Standard on Operations and Training for Technical Search and Rescue Incidents* (2017 edition) – Technical Rescue:
 - High-Angle Rope Rescue – operations or technician level,
 - Confined Space Rescue – operations or technician level,
 - Trench Rescue – operations or technician level,
 - Vehicle Rescue/Auto Extrication – operations or technician level,
- Wildland/Urban Interface – S100, S215, along with Wildland for Structural Firefighters.

WorkSafe BC

The statutory basis for occupational health and safety programs is found in the WCA and the *Occupational Health and Safety Regulation*, B.C. Reg. 296/97 (the “OH&S Regulations”), as well as in other regulations and the policies of WorkSafe BC. The requirements are complex and prescriptive. It has been our experience that many volunteer departments, although safety-conscious, struggle to manage the regulatory burden created by the WCA and the OH&S Regulations. We have not conducted a detailed review of the Department's existing OH&S program, or its compliance with the formal requirements of WorkSafe. If the Department is expanded as contemplated in response to the new development projects:

- it will be essential to ensure that its training programs and records keeping are properly maintained. “New worker” orientations, individualized training records setting out members' qualifications and proper maintenance records are essential; and
- when the Department opens a second hall – which will constitute a separate worksite – it will need to ensure that it modifies the operation of its joint health and safety committee appropriately. It is permitted for an employer to operate a single committee covering more than one worksite, but this needs to be done by application to WorkSafe.

If the Department's OH&S program and approach to occupational health and safety matters have not been formally reviewed, it may be useful to have SLRD human resources staff conduct an overall audit to support the Department's expansion process.

Fire Underwriters

This section examines the role and importance of Fire Underwriters' reviews for residents in a fire protection area and provides a brief overview of the methodology that those surveys employ. As the rating provided by the Fire Underwriters materially impacts insurance costs for both residential and commercial property owners, it is important to understand how the rating system operates and the potential impact it has on the cost-benefit analysis of local governments investing in their fire services. In particular, it is important to understand how investing in the fire service through civic taxes, to establish, maintain or improve an area's rating from the Fire Underwriters, can potentially result in a net return (or the maintenance of major net savings) for residents and area businesses.

The Department was last reviewed by the Fire Underwriters in 2008-2009. Details from that review are included below.

The Fire Underwriters are a national organization administered by Opta Information Intelligence. It has operated under a variety of names in the past (including SCM Risk Management Services Inc.), but in each instance, the organization was, and we believe remains, owned or controlled by the insurance industry.

The primary purpose of the Fire Underwriters is to establish the Dwelling Protection Grade ("DPG") and Public Fire Protection Classification ("PFPC") for each community in the country.⁵⁰ The DPG rating generally applies to single family detached residences,⁵¹ whereas the PFPC rating applies to multi-family residential, commercial, industrial and institutional buildings or districts, and generally is applied by the "commercial lines" arm of the insurance industry.⁵²

Most residential homeowners and businesses carry fire and general perils insurance, and any person with a mortgage is required to maintain such insurance by the mortgagee bank or financial institution. Entities responsible for strata developments are required by provincial legislation to maintain insurance coverage.

Where a community has a fire department that meets Fire Underwriters' standards for performance, the cost of insurance can be significantly decreased. Thus, one of the cost-benefit analyses that underpins the investment required to establish or maintain an rated fire department is the trade-off between the taxes needed to pay for the department (and meet Fire

⁵⁰ There is on-going consideration by the Fire Underwriters of the two types of classifications: it is possible that in the not-to-distant future, the two ratings will be combined so that only a single rating system exists, covering both residential and commercial/multi-family properties.

⁵¹ Under the Fire Underwriters' definitions, the DPG ratings generally apply to the following: "One- and Two-Family Detached Dwellings (buildings containing not more than two dwelling units) in which each dwelling unit is occupied by members of a single family with not more than three outsiders, if any, accommodated in rented rooms." In addition, under this system a "typical" detached dwelling is a maximum of 3,600 square feet in size. Fire Underwriters Survey website, "Terms of Reference", <http://www.fireunderwriters.ca/dwelling-protection-grade.html> accessed on 18 August 2020.

⁵² Fire Underwriters Survey website, "What is the PFPC" at <http://www.fireunderwriters.ca/public-fire-protection-classification.html>, accessed on 18 August 2020.

Underwriters' standards) and the expected savings for residents and businesses on insurance costs.

With a well-rated fire department, the savings on insurance premiums often will offset, in whole or in significant part, the costs of operating the department. For an individual with a house that is assessed at a replacement cost⁵³ for insurance purposes of \$300,000, a "protected" or "semi-protected" rating will generally result in cost saving on insurance of more than \$2,000 (annually). For commercial properties, significant reductions in insurance rates can be expected when the community obtains a PFPC rating of 7 or better. From the savings enjoyed on insurance, the tax cost of maintaining the service would then need to be deducted to determine the net direct financial benefit (or cost) of having a "rated" department.⁵⁴

By way of example, the following tables are sometimes shown in Fire Underwriters' reviews.⁵⁵ They show the amount by which "average" insurance costs drop for residential and commercial properties as the DPG or PFPC rating improves:

⁵³ It is important to emphasize that "replacement cost" and the "tax value" of a home are not interchangeable concepts. Replacement cost is driven by square footage and the cost of construction, while the tax value of a home is driven by market factors.

⁵⁴ The rating system is described in greater detail in the next section. It must be stressed that the actual cost of insurance for any homeowner or business varies based on a number of individual and site-specific factors. While the Fire Underwriters' fire grading for the area has a significant impact, a host of other considerations are also involved in the setting of insurance rates, including matters specific to the individuals or properties involved, or the competitive forces at work in the region.

⁵⁵ These tables are now several years old. Most of the more recent reports we have seen have not included them, or, where they have been included, have involved insurance cost figures which are particular to the locale. When created by Fire Underwriters, these figures were calculated on broad-based national averages in the reports in which they were used.

Table 6: DPG Rating—Estimated Insurance Costs

Replacement Value \$	Unprotected Rate \$	60± % reduction	Semi Protected Rate \$	32± % reduction	Fully Protected Rate \$
100,000	1,165		465		315
125,000	1,470		585		400
150,000	1,750		700		475
175,000	2,040		815		555
200,000	2,710		1,215		739
250,000	3,290		1,475		893
300,000	3,880		1,741		1,053
350,000	4,422		1,987		1,201
400,000	4,953		2,226		1,349
450,000	5,489		2,465		1,491

Table 6 is out of date, in that insurance costs have climbed significantly since the table was produced (~2013). However, it is still useful in showing the material savings that result from having a semi- or fully-protected rating from the Fire Underwriters.

Table 7: PFPC Rating—Estimated Insurance Cost Decreases

Public Fire Protection Classification	U-Rate Percentage Decreases
PFPC 10 to PFPC 9	99.2%
PFPC 9 to PFPC 8	96.6%
PFPC 8 to PFPC 7	82.4%
PFPC 7 to PFPC 6	74.4%
PFPC 6 to PFPC 5	63.1%
PFPC 5 to PFPC 4	53.8%
PFPC 4 to PFPC 3	48.0%
PFPC 3 to PFPC 2	47.3%
PFPC 2 to PFPC 1	45.8%

As can be seen in Table 7, ratings improvements in the commercial classification do not result in linear decreases. From a cost-benefit perspective, moving a rating from PFPC 8 down to ~PFPC 4 provides the optimal savings for businesses and multi-family properties. That non-linear relationship is worthy of consideration on a cost-benefit analysis between the amount required to be invested in improving the service and the expected insurance savings for owners

of commercial, industrial and multi-family properties.⁵⁶ Below PFPC 4, the amount of investment needed to obtain the improved rating likely will outweigh any insurance savings.

A complicating factor is that the ratings applied to a community are not necessarily uniform. Fire Underwriters considers a series of issues (examined further below), which include distance from the fire hall and availability of water supplies. Depending on the size and nature of the service area, the insurance benefits may not be equally enjoyed by all ratepayers. Thus, if the fire zone is larger than eight kilometres by road network (assuming the hall in the centre), the residents outside of the eight-kilometre zone may not enjoy the cost savings received by those residents who live within the zone.

Methodology

Overall Ratings Weighting

The Fire Underwriters' ratings are weighted against the following four areas of assessment:⁵⁷

- 40% Fire Department
- 30% Water Supply
- 20% Fire Safety Control
- 10% Fire Service Communications

The assessment also involves a consideration of the principal fire risks covered by the subject department, including determination of the required fire flows (i.e., water flow requirements for the particular hazards and risks) and the "basic fire flow" ("BFF"). The fire flow requirements are based on a series of calculations, including building size, height and exposures (how close one building is to another in the community). Taller buildings and more densely built communities generate a higher BFF – which, in turn, requires more apparatus and more firefighters.

One of the factors included in the determination of the BFF is whether there are sprinklers in the building being considered. The better and more comprehensive the sprinklering, the lower the water flow requirements for the Department.

The fire department assessment includes a consideration of apparatus, equipment, staffing, training, operations and administration, as well as the location/distribution of fire halls and fire companies. In this segment of its review, the Fire Underwriters analyze the fire department's ability to extinguish fires in all parts of its fire protection area. More recent (post-2013) reviews have 19 separate factors which are assessed in this category.

⁵⁶ The amount of savings can also vary with the particular type of industry or commercial undertaking. See the more detailed discussion of PFPC ratings below. The table gives the average of all savings, across all industry types.

⁵⁷ This information is based on various Fire Underwriters reviews we have examined in work for other clients and on the Fire Underwriters' website.

Part of the fire department assessment includes a review of the apparatus in use and its suitability for the subject department's fire risks. In general, the Fire Underwriters set 20 years as the maximum age for front-line use of apparatus by small to medium-sized communities (and recommends front-line use be limited to 15 years). It also has requirements for certain apparatus types (e.g., aerial devices) depending on its assessment of the community's fire risks, and an aggregate pumping requirement based on the BFF calculation.⁵⁸ The age of apparatus can be extended (generally to 25 years), but only by application to the Fire Underwriters and by meeting annual certification requirements.

In light of the proposed high-rise buildings in both active developments, an additional aerial device will likely be considered necessary by the Fire Underwriters.

The "Water Supply" section examines the hydrant system (if present), and considers issues such as water flow, supply reliability and system redundancy, based on criteria set out in the Fire Underwriters' "Water Supply for Public Fire Protection" document.⁵⁹ There are 15 factors which are assessed in this category. Where no hydrant system is present or where the hydrant system only covers a portion of the fire protection area, the Fire Underwriters then look at the ability of the fire department to access, load, transport and unload water against the risks faced in the non-hydrant protected area. In such cases, the assessment is usually considered as part of the "Fire Department" analysis.

In the case of the BBVFD, the original Fire Underwriters' assessment in 2008 was updated in 2009, to account for the build-out of the municipal water supply system in both Britannia Beach and Furry Creek. This re-assessment of the water supply improved the Department's commercial insurance rating for properties within five kilometres of the fire hall.⁶⁰

The "Fire Safety Control" category covers fire prevention programs/public education, fire inspections and building/fire code and bylaw enforcement. There are four factors which are assessed within this category. In general, the Fire Underwriters are looking at whether local government is making effective use of these tools in managing the level of fire risk throughout the fire protection area (e.g., inspections, code enforcement, fire prevention programs, smoke alarm programs, etc.).

As noted above, the implementation of a fire safety inspection program, combined with pre-incident planning, will improve the Department's scoring in this area of the Fire Underwriters' assessment.

⁵⁸ The Fire Underwriters recommend an aerial device once a community has a water flow requirement that is calculated to exceed 3,300 Imperial gallons per minute or where there are five or more buildings in the community which exceed 3 stories (10.7 metres) in height.

⁵⁹ Fire Underwriters, "Water Supply for Public Fire Protection" (1999), which is available at: <http://www.scm-rms.ca/docs/Fire%20Underwriters%20Survey%20-%201999%20Water%20Supply%20for%20Public%20Fire%20Protection.pdf> accessed 20 January 2020.

⁶⁰ Fire Underwriters' letter to SLRD, 16 April 2009.

The “Fire Service Communications” category involves an assessment of dispatch services, paging systems and radio communications. Seven factors are assessed within this category, including the communications centre, dispatching and paging processes, and radio communications. As the Department is dispatched by E-Comm, its scoring in this area will generally be very high (subject to any local issues relating to radio communications).

Ratings System

As noted above, Fire Underwriters’ reviews involve two entirely separate rating systems – one for residential properties (DPG) and one for commercial/multi-family properties (PFPC). Strata entities are subject to the PFPC rating, which is a more stringent standard. The DPG rating is calculated on a five-point numerical scale, whereas the PFPC rating is based on a 10-point scale. In both cases, a “1” is the highest achievable rating. In simplest terms, the goal of a Fire Underwriters’ review is to provide insurance companies with a grading of fire protection services provided within a particular fire protection area.

Insurance companies use the grading provided by the Fire Underwriters as one of a number of factors in determining local fire protection insurance rates. It should be emphasized that the system is quite fluid, and individual insurers can and will set rates based on considerations other than the Fire Underwriters’ ratings (either higher or lower, depending on the insurer’s perception of actual risk, competitive concerns and other factors).⁶¹ It is the responsibility of individual insurance companies to determine what weight they give the Fire Underwriters’ grading when determining insurance rates.

DPG Rating

For residential properties, the rating system is graded on a scale from 1 – 5 where “1” is best possible rating. The rating of “3” is split into two subcategories where “3A” indicates that there is an approved hydrant or water supply system, and “3B” indicates that the department relies on mobile water supplies. From the insurance industry’s perspective, the ratings for residential homeowners are generally treated as follows:

Table 8: DPG Rating Details

DPG Rating	Insurance Status	Comment
5	Unprotected	No savings on insurance from having a fire department.
4	Semi-protected	Some savings on insurance likely will be enjoyed; in some regions, this rating and “3B” are treated as essentially equivalent.

⁶¹ See a list of other factors on the Fire Underwriters Survey website, “How the PFPC affects individual insurance policies” at <http://www.fireunderwriters.ca/public-fire-protection-classification.html>, accessed 20 January 2020.

DPG Rating	Insurance Status	Comment
3B	Semi-protected	This is usually the rating level at which significant cost savings on insurance are enjoyed. This is usually the highest rating available in areas which are not hydrant-protected.
3A; 3B(s) ⁶²	Protected	Progressively greater savings on insurance. Fully protected status typically means a savings of 50-60+% on insurance costs.
2	Protected	
1	Protected	

In general, the Fire Underwriters estimate that a community which achieves fully protected status can enjoy savings on insurance of up to 60% (or more) versus communities which are “unprotected”.⁶³ By way of example, in a fire master plan we worked on, two of the members of council to whom we delivered the report exemplified the difference that the Fire Underwriters’ rating makes. In that instance, the fire department’s coverage zone was greater than eight kilometres, so residents outside of the eight-kilometre zone did not receive the benefit of a reduced insurance rate. One councillor was paying more than \$3000 annually for insurance, while the other was paying less than \$1000 – in relation to properties that the two agreed were otherwise broadly similar.⁶⁴

There are some fundamental location and distance requirements for an area to receive a protected or semi-protected rating under the DPG classification:

- residents must live within eight kilometres by road of a fire hall (i.e., the measurement is based on distance travelled on the existing road network, not in a straight line from the fire hall). For the Department, this distance calculation can be affected by highway access issues (e.g., if the truck has to backtrack to gain access to the highway); and
- for hydrant protected areas, the residence must be within 300 metres of a fire hydrant (otherwise, the residence is classed based on the community's "non-hydrant protected" rating).⁶⁵

⁶² A rating of 3B(s) is a Fire Underwriters’ accreditation for tanker shuttle capability, where a department is able to demonstrate its ability to maintain a specified water flow for a stipulated period of time, using tanker units. It applies to areas which are not hydrant-protected, and must be periodically renewed. This specialty rating is treated by most insurers as being the equivalent of a “DPG 3A” (fully protected) rating.

⁶³ This estimate is based on statements in various reviews conducted by the Fire Underwriters we have reviewed for other clients over the past decade or more.

⁶⁴ The example also illustrates a problem where the financial benefits of having a fire department are not always equally enjoyed by all taxpayers.

⁶⁵ This distance can be extended to 600 metres if a department is certified by the Fire Underwriters as capable of “large diameter hose-lay”. See: Fire Underwriters , *Accreditation of Alternate Water Supplies for Public Fire Protection* (2012), at: <https://fireunderwriters.ca/Resources/FUS-AlternativeWaterSupplyAccreditationProtocol2012.pdf> accessed on 23 August 2020.

Single family residential properties which are more than eight kilometres by road from a fire hall are treated as DPG 5 (unprotected).

PFPC Rating

The PFPC rating, which is determined at the same time as the DPG rating, is based on the four fundamental factors identified above. This rating has a 10-point scale: few volunteer or paid-on-call departments are able to get a score of “5” or better. Even so, achieving a “6” or a “7” will reduce insurance costs for commercial and multi-family properties. The PFPC rating is essentially a benchmarking against various standards or requirements in each category and in relation to other communities.

For a commercial property, the application of the rating system depends on the distance from the fire hall (a maximum of five kilometres) and, in hydrant protected areas, distance from a fire hydrant (a maximum of 150 metres). These requirements can result in “split ratings” for a fire protection area. The Fire Underwriters website used to include a description of split ratings as follows:⁶⁶

"In many communities, FUS develops a split classification (for example, 5/9). Generally, the first class, (Class 5 in the example) applies to properties insured under Commercial Lines within five road kilometres of a fire station and within 150 metres of a fire hydrant. The second class (Class 9 in the example) applies to properties insured under Commercial Lines within five road kilometres of a fire station but beyond 150 metres of a hydrant. FUS assigns Class 10 to properties insured under Commercial Lines that are located beyond five road kilometres from the responding fire station."

In the context of other work we have undertaken, we have reviewed information from the Fire Underwriters which suggests that for each level of improvement in the PFPC classification, the average commercial insurance cost for a typical area will drop by approximately 4 – 15%, depending on which level of the scale one is on (see the chart above).

It should be noted that newer Fire Underwriters’ reviews, in addition to introducing more detailed ratings and some new concepts,⁶⁷ are increasingly focused on fire prevention, fire education and the importance of bylaws which support good fire protection practices (e.g., sprinklering requirements, a well-considered fire inspection program, building and electrical code enforcement, etc.).

⁶⁶ The Fire Underwriters’ website has been reorganized and this particular language is no longer found, although the concept is still applied.

⁶⁷ Some of the concepts introduced over the past several years include a “divergence penalty” – where either the water supply system or the fire department is markedly better than the other, the overall score will be reduced – and a general penalty for “special hazards analysis”, which seems to be a largely subjective assessment of risks from natural or environmental factors (e.g., earthquake, wildfire and weather).

Current Fire Underwriters' Rating for the Department

The Fire Underwriters' rating for the Department is contained in a summary letter from 2009 and the discussion in this report is based on that.⁶⁸

Fire Underwriters – Summary

The proposed developments will materially increase density and building heights in the Department's response zone. They have the potential of adversely affecting the Department's rating from the Fire Underwriters unless the Department is able to expand to meet the increased risks. The addition of a second hall at Furry Creek, however, should improve the PFPC classification for the commercial and multi-family properties in that area, as they would then fall within five kilometres of a rated fire hall.

In addition to the new hall, it should be expected that the Fire Underwriters will be concerned about:

- the Department's staffing levels, member training and ability to respond effectively to risks in high-rise and multi-storey structures;
- the apparatus available to the Department – in particular, the necessary aerial devices – and the Department's overall pumping capacity;
- the implementation of mutual and/or automatic aid arrangements with Squamish and Lion's Bay;
- the water system's capacity in light of the higher BFF requirements (and increased daily consumption for ordinary purposes); and
- the implementation of appropriate and regular fire prevention activities (fire inspections, code enforcement, pre-incident planning, etc.).

Mutual Aid

Mutual aid agreements are essential tools that enable fire departments to provide aid to one another when circumstances warrant. They permit departments to share resources and specialty services (e.g., specialty rescue or hazardous materials responses), and enable them to obtain critical support for major incidents or other situations where a department's resources are overwhelmed by events. Mutual aid agreements require a specific request for assistance from the requesting department before another department responds to the incident.

Operationally, it usually means that a department arrives on scene, determines it will need assistance, and then makes a request through its dispatch provider for a mutual aid turn out. This can result in a significant delay before assistance arrives.

⁶⁸ The complete rating at some point prior to this is not available.

Automatic aid agreements are a variant under which the participating departments agree that they will be automatically dispatched to assist a neighbouring department. Many of these types of agreements limit the call-outs to certain classes of calls, such as structure fires. Some automatic aid agreements further refine the approach by specifying particular areas covered (e.g., areas along each department's border), the nature of assistance provided (e.g., ladder trucks or tenders, MVI responses, etc.), the time of day (e.g., call-outs during work days when responses may be weak for volunteer or paid-on-call departments) and similar factors. Automatic aid agreements require close collaboration both between the participating departments and with their dispatch providers. The principal benefit of automatic aid agreements is that they minimize the delay before additional resources begin responding from an assisting department, which enhances the safety residents and responders alike.

It should be noted that a formal aid agreement is necessary to ensure that a responding department is authorized to provide assistance and has the necessary power and authority to provide services within the requesting department's jurisdiction.

The Fire Underwriters grant partial staffing and apparatus credit to departments using aid agreements, with more credit generally being granted for automatic than mutual aid. As the Department will have some lag times in building out its response capacity, appropriate aid arrangements with its neighbours could materially assist in ensuring the necessary response capacity as the developments are rolled out.

Although the SLRD has discussed the possibility of mutual aid with Squamish and Lion's Bay in the past, there is no agreement currently in place. As part of this review, the Consultants met with both Squamish and Lions Bay. While both are receptive to the general idea, there are some legitimate concerns that will need to be addressed.

From the perspective of Squamish, it was not clear that there would be much mutuality in the arrangement. In other words, Squamish is less likely to call for assistance from the BBVFD than the reverse. In this case, the issue can be addressed by including a "charging" provision, where the requesting department pays for the assistance provided by the responding department, based on an agreed charge-out rate. This approach is not uncommon, and underpins, for example, the aid agreement used by the Metro fire departments.⁶⁹

Lion's Bay was similarly concerned about the possible lack of mutuality. In addition, Lion's Bay is part of the Metro area mutual aid structure. If Lion's Bay's resources were out of position assisting the BBVFD, it would call on support from West Vancouver. Any formal discussions with Lion's Bay will therefore need to include West Vancouver, to ensure that all of the potentially affected parties are comfortable with the arrangements.

Appropriately developed aid agreements cover a host of operational and practical matters, ranging from joint training, to regular reviews of responses. They also specify a responding department's operational powers and authority, and typically contain liability exclusion and

⁶⁹ Metro Vancouver Regional District, "Mutual Aid Agreement for Emergencies" (13 October 1995) (as amended).

indemnity clauses in favour of responding departments. We have provided an aid agreement template to the Department, which canvasses these types of issues in detail and which can be structured as a multi-party arrangement or a bilateral agreement.

Fire Service Issues

Fire Service Context

The standards of service that apply to the fire service include those related to response time objectives. These response times have been developed by the NFPA and include time intervals for 911 call handling, dispatch, turnout of crews and travel to the scene. Each of these components will be described in further detail in the following sections, however, a key element for all fire responses is the relationship between time and the degree of fire damage (and risk from structures fires). It is that relationship which has driven the NFPA to develop these response standards. The fire propagation curve is illustrated in Figure 14 which shows the rate of change / percentage of destruction from the time at which a fire ignites. This fire propagation model has been empirically tested and explains why each element of fire response is critical, as at or about eight minutes from ignition, a fire will flashover and extend beyond the room of origin. This increases the risk to the resident as well as to the firefighter, and materially increases the amount of resulting damage.

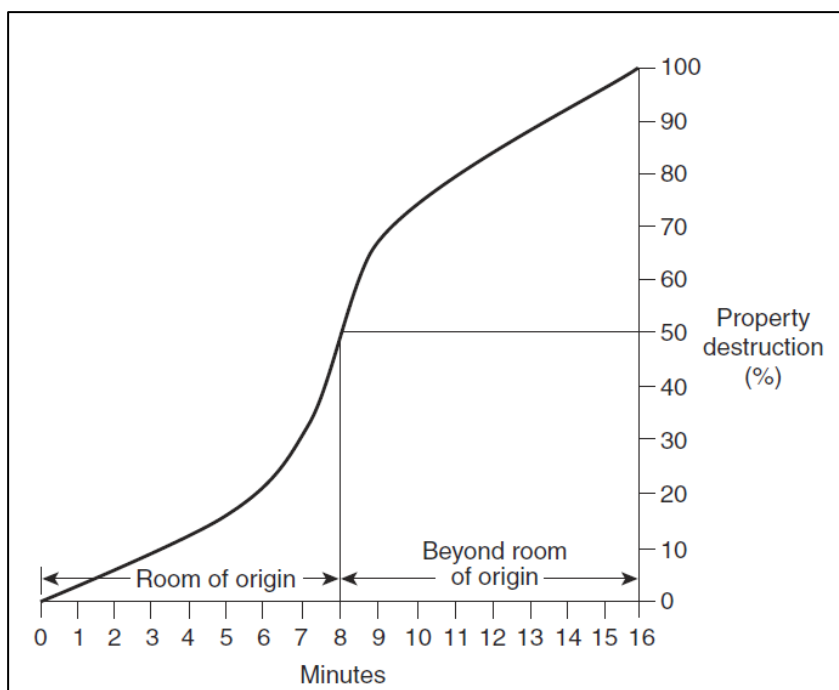


Figure 14: Fire Propagation Curve

The relationship between the deployment of sufficient firefighters and apparatus within a defined timeframe relative to fire loss and injury has been documented by the NFPA and summarized in NFPA 1710. This correspondence is shown in Table 9, and from this it can be seen that controlling a fire to the room of origin results in an average dollar loss of \$2,993.

Table 9: Relationship between deaths, injuries and damage to containment to the room of origin or beyond

Flame Spread	Civilian Deaths	Civilian Injuries	Average Dollar Loss per Fire
Confined fires or contained fire identified by incident type	0.000	8.7	\$200
Confined fire or flame damage confined to object of origin	0.4	11.1	\$1,200
Confined to room of origin, including confined fires and fires confined to object	1.8	23.8	\$4,000
Beyond the room but confined to the floor of origin	16.2	76.3	\$35,000
Beyond floor of origin	24.6	55.0	\$65,900

For fires which extend beyond the room of origin but which are contained to the floor of origin result in an average dollar loss of \$35,000 while fires which extend beyond the floor of origin result in an average dollar loss of \$65,00⁷⁰ as shown in Figure 15.

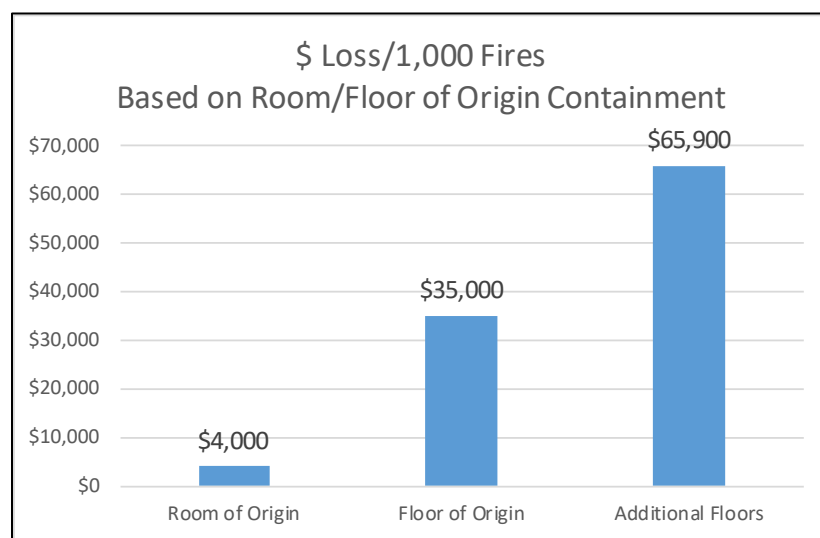


Figure 15: Average \$ Loss / 1,000 Fires

⁷⁰ The data used in this table is for the United States. There is no similar aggregation of national or provincial data in Canada.

Similarly, Figure 16, illustrates that where a fire is held to the room of origin, civilian fire injuries are less than half those for a fire that extends beyond the room of origin.

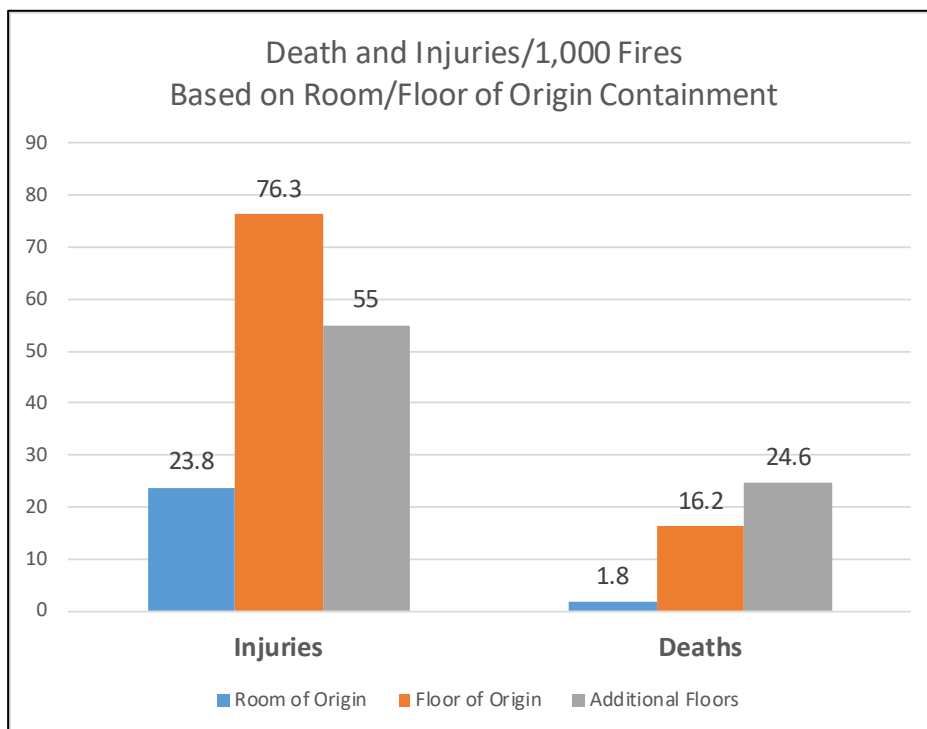


Figure 16: Death and Injuries / 1,000 Fires

In the case of fire deaths, they do not exceed 1.8 per thousand fires if the fire is held to the room of origin, but where the fire extends beyond that point there are the number of deaths per thousand fires increases dramatically.

This focus on the criticality of a timely response for all emergencies underpins the requirements for appropriate numbers of trained and equipped firefighters to be dispatched and travel to a structure fire. The following sections will discuss further the numbers of firefighters required for specific structure fires including an analysis of high-rise fires. The timeliness of the response is also part of the analysis by the Fire Underwriters for protected properties to be within a limited distance from a compliant fire hall.

NFPA Staffing Model

The NFPA in its most recent edition provides a staffing model for single family residences, garden-style apartments, low-rise strip malls and high-rise structures. The detailed analysis can be found in Appendix 3: Structure Fire Staffing Analysis and is summarized as follows:

- Single Family Residence: total of 16 firefighters, or 17 if an aerial ladder is used
- Open-air Strip Shopping Centre: total of 27 firefighters, or 28 if an aerial ladder is used

- Garden-style Apartment: total of 27 firefighters, or 28 if an aerial ladder is used
- High-Rise: total of 42 firefighters, or 43 if the building is equipped with a fire pump

High Rise Response

Responses to fire in high-rise structures was reviewed for the Surrey Fire Service in 2008 by the Manitou Corporation⁷¹. The High-Rise Fire Service Study (the “Manitou Study”) presented a historical survey of high-rise fires and applicable standards and made a series of recommendations. The Study defined high-rise structures as those taller than 75 feet or greater than seven stories⁷².

The Manitou Study reviewed a number of high-rise fires that occurred in sprinklered buildings for various reasons, most often because the sprinkler system was disabled for maintenance work or was otherwise not operational for reasons including pressure reducing valves not set properly. Other reasons include failure to respond to an alarm activation in a timely manner, or when doorways from a fire involved room are left open into a hallway.

The Manitou Study noted that sprinklered buildings are very safe structures, but for any fire response, require a significant commitment of personnel and apparatus and recommended the following response model for Surrey⁷³. This model recommends six Type 1 Engines, two Ladder units, various support vehicles and chief officers. Although this level of response may not be practical for the BBVFD, it was noted earlier that the Sechelt VFD could be considered a more relevant best practice and their high-rise response is a minimum of four Type 1 Engines, two Ladders and supporting vehicles.

Table 15 -- Recommended Alarm Response: Sprinklered High-Rise

	Engines	Aerial	Chief	Support
Automatic Alarm	1	1		
Reported Structure Fire	3	1	Battalion Chief	
Confirmed Fire	2		Staff Chief	Rehab Unit, Communications Van

Figure 17: Response Model—High-Rise Buildings

The initial response to a monitored alarm in a high-rise would include one Engine and one Ladder; if the call was reported as a structure fire and additional three Engines and one Ladder; on the report of a confirmed fire this would be further supplemented by two Engines, a rehabilitation unit and a communications van to support the incident. Thus, the total for a

⁷¹ High-rise Fire Service Study, Manitou Incorporated, Peekskill, New York.

⁷² Ibid, page 4.

⁷³ Ibid, page 29.

working fire in a sprinklered building is recommended to a total of six engines and two Ladder trucks.

The Manitou Study also confirms the requirement for pre-planning and detailed information provided from the dispatch CAD system for responding personnel as well as pre-arrival instructions for building residents.⁷⁴

Fire Halls

The number of fire halls for the BBVFD will ultimately grow to three when all the proposed developments are implemented. For the near term, the further development at Furry Creek will require a second fire hall to be built and activated with apparatus and staff that mirror what should be in place for the hall at Britannia Beach.

The fire hall proposed for Furry Creek has a site identified by the developer and the configuration for this fire hall with up to four apparatus bays and its final configuration is under active discussion as this report is being prepared.

Recruitment and Retention – Personnel Requirements

The Department will be required to staff and operate from the fire hall at Furry Creek with a minimum of 15 firefighters which suggests a roster of 20 to allow for those in training who are not yet qualified.

The training period is likely be a minimum of two years for a recruit to be competent at the Interior Operations level. As the development in this area is completed the recommendation is for the BBVFD to become Full Service to properly manage the response to high-rise buildings that will initially be six stories, but a full buildout may approach 15 stories.

Apparatus

The apparatus for the new Furry Creek fire hall should include, at a minimum, a Quint/Ladder similar to the one to be provided for the hall at Britannia Beach. The Quint should be a minimum of 75 feet, and it is recommended it be a single axle unit. The hall should also have a minimum of one Type-1 Engine and one Type-3 Engine, the latter should be a four-wheel drive unit. The hall should also have a number of utility vehicles to serve as equipment trucks, to convey charged air bottles to the scene and for firefighters to travel to and from the emergency scene.

The apparatus plan for the second fire hall should replicate the apparatus at Britannia Beach to facilitate training and operation by the volunteers who may respond from either area to either fire hall based on their location at the time they are paged. The capital plan for fire apparatus will be significant for the SLRD as there is a need also to replace the Ladder at Britannia Beach as it is beyond the age limit allowed by the Fire Underwriters.

⁷⁴ Ibid, page 30

Water System

The water source for each of the developments is provided by the SLRD and the systems to supply this to the developments is being reviewed and subject to approval by the SLRD. One recommendation noted elsewhere in this document is to have the fire hydrants for each of the developments subject regular review and testing and the results of those tests provided to the Department in a timely manner.

Dispatch / Communications

Fire dispatch for this region is provided by E-Comm which manages call taking and dispatch for Squamish and Britannia Beach; the two departments operate on a legacy radio system with some shared channels. Lions Bay, immediately to the south is in Metro and is dispatched by the Surrey Fire Department and operates on the E-Comm regional radio system which is digital and encrypted.

Ensuring safe and effective operation with these departments will require the development of a communication plan to address call management and channel sharing to the degree this will be possible. At some point the extension of the regional radio system for Britannia Beach and Squamish should be discussed with E-Comm. If the E-Comm system will not be extended to this region, then an alternate communication plan should be developed and tested to ensure safe and effective multi-department responses.

As well, the development plans for each of the projects under consideration should include the implementation of suitable in-building radio coverage for all new construction which may include in-building passive antenna systems to ensure safe and effective radio communications for responding fire departments.

Future Model

Anticipated Timeline

There are three areas considered for development; two of them, Tiger Bay at Britannia Beach and Fine Peace at Furry Creek have proposed timelines. The third, the Porteau site, is less clear.

Based on the information provided, the development timeline for the entire BBVFD response area could take 25 years to complete.

Britannia Beach (Tiger Bay)

The development proposed for Britannia Beach by Tiger Bay contemplates four phases taking 25 years to complete⁷⁵.

Table 10: Tiger Bay Proposed Development

Phase	Timeline	Elements
1	1-5 years	• Wavegarden surf park • Skate park and pump track • Brewery • 20 cabins • Basic services infrastructure • Sewer connection • Water wells and treatment • Entrance road • Wetland and Gravel Creek landscaping
2	6-10 years	• 282 residential units ○ 152 townhomes ○ 80 apartments ○ 50 affordable units • Surf hotel ○ Number of units to be determined • Retail and commercial village • Cabin hotel phase 1 ○ Number of units to be determined • Minaty Bay Park • Main boulevard and full services infrastructure • Stormwater management • Minaty on/off ramp • Tunnel upgrade • Railroad crossing

⁷⁵ Document: South Britannia—summary for Dave Mitchell & Associates Ltd. provided by email 29 July 2020.

Phase	Timeline	Elements
3	11-15 years	• 414 residential units ○ 174 townhomes ○ 240 apartments ○ 4 live/work townhomes • Community retail • Cabin hotel phase 2 ○ Number of units to be determined • Community centre • Main boulevard and full services infrastructure • Roading and servicing for new units
4	16-25 years	• 354 residential units ○ 234 townhomes ○ 120 apartments • Minaty Bay Lodge ○ Number of units to be determined • Roading and servicing for new units

The estimated number of residents is shown in Table 11. The number and type of structures is from the information provided and uses two estimates for the number of residents per unit. These may or may not reflect the actual numbers and can be adjusted based on further information. There are three additional structures planned for phases two, three and four which do have the number of units calculated. The number of units should be estimated if possible, to provide a better understanding of the total impact to the Department in terms of response.

Table 11: Estimated Number of Residents - Tiger Bay four phases of residential construction.

Tiger Bay	Cabins	Surf Hotel	Cabin Hotel	Minaty Lodge	Town homes	Live-work town homes	Apartments	Affordable units	Total Units	Residents @2.5/unit	Residents @3.0/unit
Phase 1	20								20	50	60
Phase 2		TBD	TBD		152		80	50	282	705	846
Phase 3			TBD		174	4	240		418	1,045	1,254
Phase 4				TBD	234		120		354	885	1,062
Non-Hotel					560	4	440	50	1,074	2,685	3,222
Hotel		190							190	475	570
Total									1,264	3,160	3,792

A summary of the number of structures to be constructed in each phase assuming a start in 2021 is shown in Table 12. Of these it is proposed by the developer that six stories would be the maximum number of floors.

Table 12: Tiger Bay timeline for residential construction

Residential Structures	2021 through 2026	2026 through 2031	2031 through 2035	2036 through 2046	Total
Cabins, townhomes, live-work townhomes, affordable units	20	282	418	354	1074
Surf Hotel		TBD	TBD		
Cabin Hotel			TBD		
Minaty Lodge				TBD	
All Hotel/Lodge units		190			1,264

In addition to the number of buildings that could contain residents or guests there is an unspecified number of commercial buildings and those related to infrastructure.

Furry Creek (Fine Peace)

In the case of Furry Creek, the plans by Fine Peace are to add to the current number of residential and commercial structures⁷⁶. At the present time there are a total of 96⁷⁷ single detached residences, eight duplexes and 72 townhouse units.

Beyond that, Fine Peace proposes to build an additional 864 residential units including multi-story units over a ten to twelve-year period.⁷⁸ In their proposal they describe completing 80 to 100 units per year over ten years starting in 2023 after completing 16 units in Oliver's Landing in 2021.⁷⁹ This would result in a total of 1,040 units. The development would proceed in seven phases (Figure 18) within this period; the proposal does not at this point have which years in which these will occur.

- Phase 1 Completion of Lot 1, Lot 4 and Village Commercial Area
- Phase 2 Lot 2 and Collector Areas
- Phase 3 Marina and Resort Areas
- Phase 4 Uplands and South Area
- Phase 5 Uplands North and Mountain Areas
- Phase 6 North West and North East Areas
- Phase 7 Upper Benchlands Area

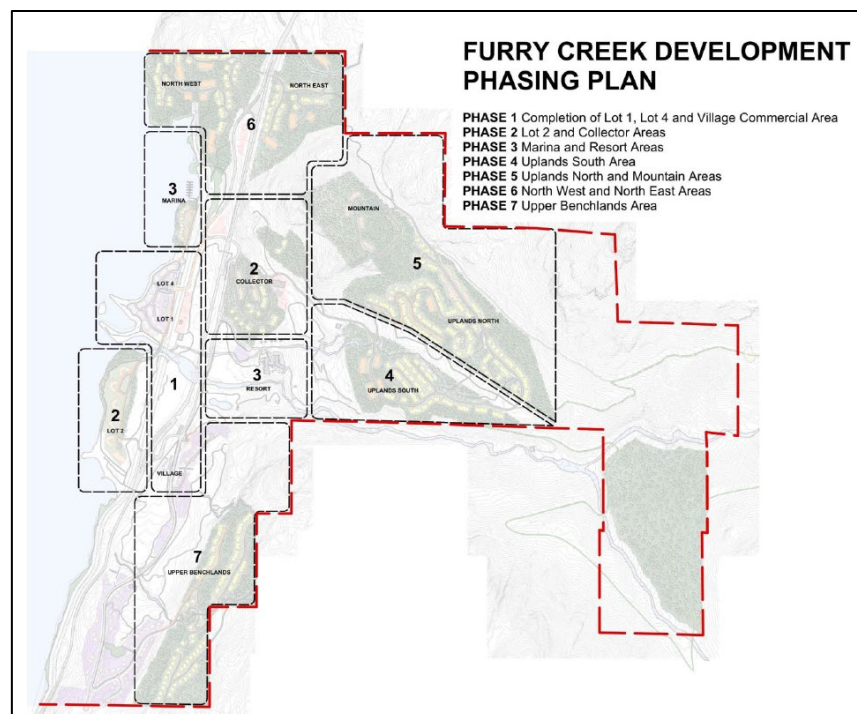


Figure 18: Furry Creek Proposed Development. Source: Fine Peace.

⁷⁶ Information provided by the SLRD by email 7 July 2020.

⁷⁷ This total includes 16 units to be completed at Oliver's Landing in 2021.

⁷⁸ Information provided by Fine Peace, received by email 7 July 2020.

⁷⁹ Fire Peace, page 2.

In terms of total population this can be estimated using multipliers as in the previous discussion regarding Tiger Bay. To be clear this is a general estimate generated solely for the purpose of calculating the order of magnitude population change over time.

Table 13: Furry Creek - seven phases of residential construction.

Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Units added	160	16	-	90	90	90	90	90	90	90	90	90	54
Total	160	176	176	266	356	446	536	626	716	806	896	986	1,040
Population @2.5/unit	400	440	440	665	890	1,115	1,340	1,565	1,790	2,015	2,240	2,465	2,600
Population @3.0/unit	480	528	528	798	1,068	1,338	1,608	1,878	2,148	2,418	2,688	2,958	3,120

The development will also include a resort hotel and spa and the number of rooms for this is to be determined. Based on the similar multipliers this has the effect of increasing the population at certain times of the year. The overall height of the properties is greater than that proposed for Tiger Bay, with various phases with six, eight, eleven and fifteen stories⁸⁰; the tallest of these in phase 6.

⁸⁰ Fine Peace, page 16

Porteau (Concord Pacific)

The development timeline for Porteau was published in 2007 and there has been little development on the ground since that time. The SLRD has provided a summary of the development based on the 2007 documentation and any further updates.

There are two phases, the first alongside Highway 911, the second above the highway and identified as the Benchlands. The various diagrams below are drawn from materials prepared and made public by Concord Pacific.

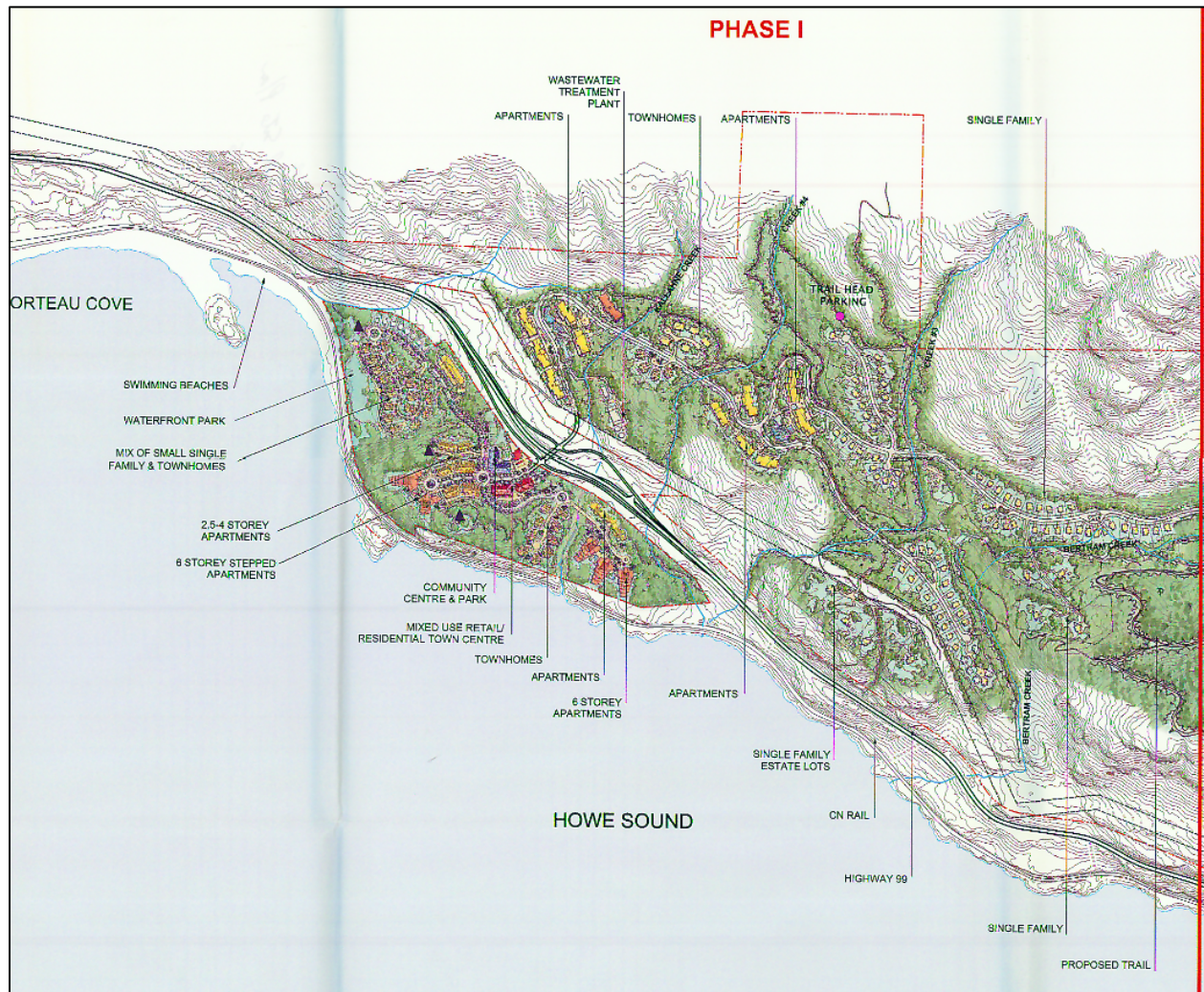


Figure 19: Porteau Phase 1



Figure 20: Porteau Phase 2

Although the timelines are uncertain, Table 14 summarizes the population over the two phases as well as the number of residential structures.

Table 14: Porteau Development – population estimates

	Phase 1			Phase 2		
	Units	Population @2.5	Population @3	Units	Population @2.5	Population @3
Single Detached Residential	91	228	273	470	1,175	1,410
Duplex	18	45	54	239	597.5	717
Townhouse	78	195	234			
Apartment	498	1245	1494			
Live Work	6	15	18			
Total Units	691			709		1,400
Total Population @2.5 per unit		1,728			1,773	3,500
Total Population @3 per unit			2,073			4,200

The housing types include:⁸¹

- Single family
- 3 storey townhomes/duplexes
- Stacked townhomes
- 2.5 to 4 storey apartments
- 6 storey apartments
- Retail/residential mixed use

⁸¹ Source: Porteau Cove Conceptual Site Plan

Timeline Summary

The development timeline should each of the three development areas proceed, would be a minimum of 25 years. The timeline proposed for Tiger Bay at Britannia Beach is 25 years; Fine Peace at Furry Creek is estimated to take 10 to 12 years and at this point there is no timeline for Porteau Cove.

For the purpose of developing an end-state for the final buildout of the Department, we will assume a 25-year period from 2021 to 2047 and include Porteau Cove. Based on that assumption, the final population and number of structures is summarized in Table 15:

Table 15: Population Estimates and Number of Residential Units

25 Year Estimate	Tiger Bay	Fine Peace	Porteau	Total
Residential Units	1,074	1,040	1,400	3,514
Population @2.5	2,685	2,600	3,500	8,785
Population @3.0	3,222	3,120	4,200	12,299

The notional timeline for the full development is shown in Figure 21 on the following page. What this suggests is that if Tiger Bay and Fine Peace receive approval and proceed on schedule, it means that within five years, there may be an additional 300 housing units with 1,500 to 1,600 additional residents. Within 10 years, Furry Creek may be fully built out with a total of 1,040 units and a population of some 2,600 to 3,120 residents (counting those currently in Furry Creek). Britannia Beach may be near 300 units and 750 to 900 residents.

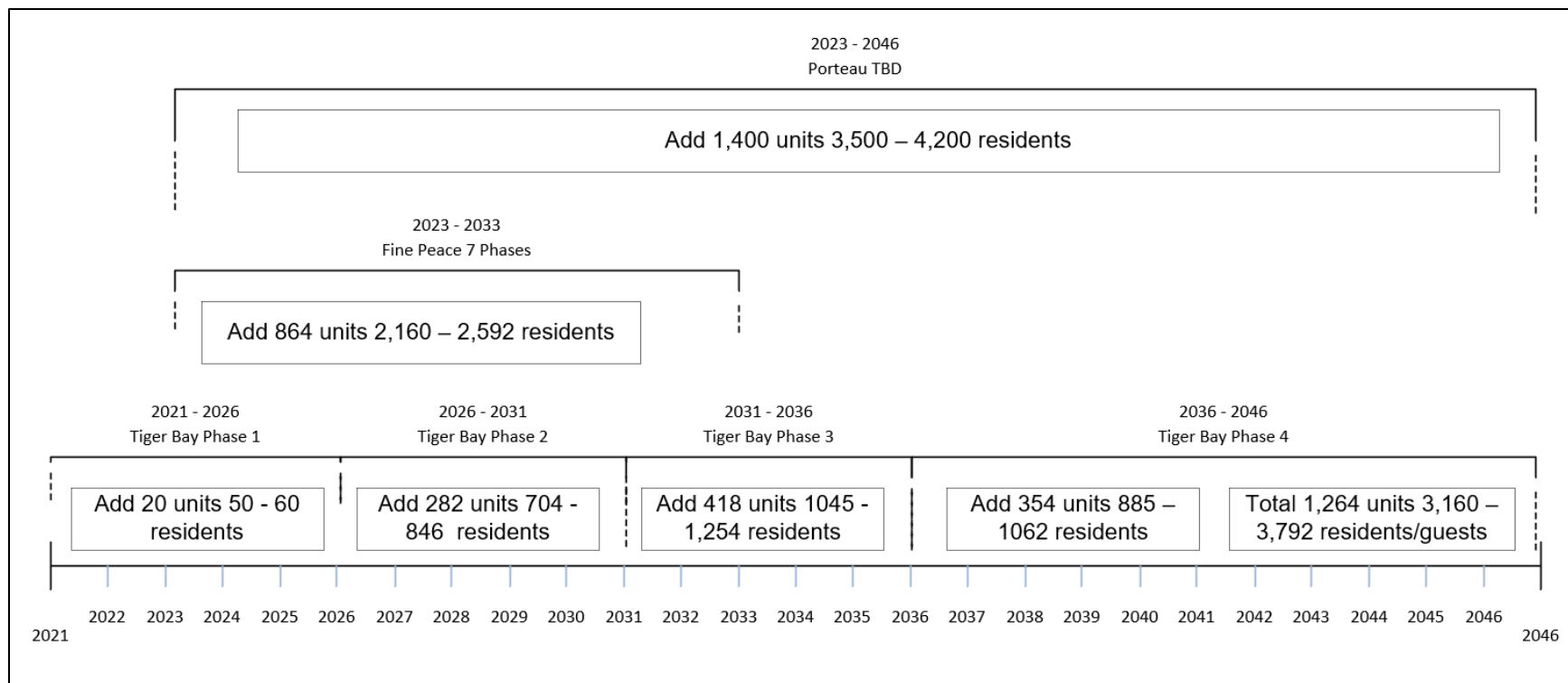


Figure 21: Notional Timeline for Three Developments.

Transition Plan

The fire department transition plan for the Fine Peace and Tiger Bay developments are contained in a companion document which is based on the information provided by the developers in terms of scale and timing.

Based on this information the strategic issues for the SLRD and the Department are discussed, and it should be noted that these will require a great deal of effort for the initial years assuming approval. At a high level the Department will essentially double in the number of fire fighters, will expand from one to two fire halls and its level of service will change from the current Exterior level of service to Interior in the near term and to Full Service to effectively and safely manage responses to high-rise structures.

The Department will also necessarily require a full-time commitment from the Fire Chief and the management team to manage these transitions, the recruitment and retention of many new firefighters as well as the procurement of apparatus, personal protective equipment and the build and fit out of a second fire hall. All of these will require administrative support by the SLRD and an appropriate transition budget until steady state is reached at some point.

The transition will also require an immediate effort to confirm a response by the adjacent fire departments either by mutual aid or service agreements. There is an urgency to this as, given that approvals are provided for one or both of the applicants, there will be an immediate increase to the potential for responses during the construction phase which even has the potential to generate simultaneous incidents requiring response.

Recommendations

- Amend the service bylaw to change the Department's service level from Exterior Operations to Interior Operations.
- Provide a bylaw to ensure regular testing of all private fire hydrants.
- Develop a new training plan to begin the process of increasing the qualifications of all current members to the Interior Operations level.
- Amendment of service bylaw to create a fire inspection system in accordance with current Fire Services Act and using a risk-based approach to set inspection frequencies.
- Create an operational guideline for the fire inspections program.
- Create an operational guideline for Pre-Incident Planning and acquire a preplan template.
- Create operational guidelines to address interior operations.
- Review radio communications requirements for the BBVFD as well as Squamish and Lions Bay to ensure safe and effective interoperability.
- Ensure that all new buildings within the areas being developed have planned and tested radio coverage enhancement systems to ensure safe and effective operations within all planned structures.
- Add part-time resource to manage department training requirements; plans, scheduling, delivery, records management.
- Develop and confirm the apparatus plan for two fire halls and ensure procurement occurs within a timeframe to allow for training and familiarization prior to the time it will be required. The apparatus plan should be based on the principle that fire apparatus and other equipment for the fire halls should be fully compatible and as nearly identical as possible.
- Develop a transition budget for two to four years to manage the one-time issues related to recruitment, training and procurement of apparatus and equipment.
- Review recruitment and retention policies and procedures to address the need for a significant increase in membership.
- Establish a budget to replace the current aerial apparatus in 2021.

Appendix 1: List of Defined Terms and Abbreviations

Term	Definition
2015 Guide	<i>BC Fire Services Act: Regular System of Inspections – Considerations for Development</i> (January 2015)
AHJ	Authority Having Jurisdiction
BCEHS	British Columbia Emergency Health Services
BFF	Basic Fire Flow
BBVFD	Britannia Beach Volunteer Fire Department
Bylaw No. 1032	<i>Howe Sound East Fire Protection Service Establishment Bylaw No. 1032-2006</i>
Bylaw No. 1561	<i>Squamish-Lillooet Regional District Fire Services Administration Bylaw No. 1561-2018</i>
CAD	Computer Aided Dispatch
CAO	Chief Administrative Officer
DMA	Dave Mitchell & Associates Ltd.
Department	Britannia Beach Volunteer Fire Department
DPG	Dwelling Protection Grade
E-Comm	Emergency Communications for British Columbia
Fine Peace	Fine Peace Corporation
Fire Safety Act	<i>Fire Safety Act</i> [SBC 2016]
Fire Services Act	<i>Fire Services Act</i> [RSBC 1996]
Fire Underwriters	Fire Underwriters Survey
FMR	First Medical Response
FUS	Fire Underwriters Survey
GPM	Gallons Per Minute
Guide	Office of the Fire Commissioner, <i>Interpretive Guide: Criteria for Determining Frequency of Inspections</i> (July 1992)
IDLH	Immediately Dangerous to Life or Health
JIBC	Justice Institute of BC
JPR	Job Performance Requirements
LAFC	Local Area Fire Commissioner
Manitou Study	<i>High-rise Fire Service Study</i> , Manitou Incorporated, Peekskill, New York
Metro	Metro Vancouver Regional District

Term	Definition
MVI	Motor Vehicle Incidents
NFPA	National Fire Protection Association
OFC	Office of the Fire Commissioner
OH&S	Occupational Health & Safety
OH&S Regulations	<i>Occupational Health and Safety Regulation</i> (B.C. Reg. 296/97, as amended)
PFPC	Public Fire Protection Classification
Playbook	Office of the Fire Commissioner, <i>Structure Firefighters Competency and Training Playbook</i> (2nd Edition, May 2015)
S2S Highway	Sea-to-Sky Highway
SFD	Sechelt Fire Department
SLRD	Squamish-Lillooet Regional District
Tiger Bay	Tiger Bay Corporation
WCA	<i>Workers Compensation Act</i> (B.C.)

Appendix 2: Playbook Training Requirements

Structure Firefighters Competency and Training

PLAYBOOK

Second Edition: May 2015

References to NFPA Standards for:

- Train the Trainer
- Exterior Operations Firefighter
- Interior Operations Firefighter
- Full Service Operations Firefighter
- Team Leader Exterior and Interior
- Risk Management Officer
- Company Fire Officer

Standards Referenced:

NFPA 220	Standard on Types of Building Construction
NFPA 921	Guide for Fire and Explosion Investigations
NFPA 1001	Standard for Fire Fighter Professional Qualifications
NFPA 1021	Standard for Fire Officer Professional Qualifications
NFPA 1041	Standard for Fire Service Instructor Professional Qualifications
NFPA 1407	Standard for Training Fire Service Rapid Intervention Crews
NFPA 1500	Standard on Occupational Safety and Health Program
NFPA 1584	Standard on the Rehabilitation Process for Members During Emergency Operations and Training Exercises
NFPA 5000	Building Construction and Safety Code

Train the Trainer	Competency Met
NFPA 1041 4.2.1 – 4.2.4 / 4.3.2 – 4.3.3 / 4.4.1 – 4.4.4 / 4.5.1 – 4.5.3 and 4.5.5	
4.2.1 Definition of Duty. The management of basic resources and the records and reports essential to the instructional process.	
4.2.2 Assemble course materials, given a specific topic, so that the lesson plan and all materials, resources, and equipment needed to deliver the lesson are obtained. (A) Requisite Knowledge. Components of a lesson plan, policies and procedures for the procurement of materials and equipment, and resource availability. (B) Requisite Skills. None required.	Yes ☐ No ☐
4.2.3 Prepare requests for resources, given training goals and current resources, so that the resources required to meet training goals are identified and documented. (A) Requisite Knowledge. Resource management, sources of instructional resources and equipment. (B) Requisite Skills. Training schedule completion.	Yes ☐ No ☐
4.2.4 Schedule single instructional sessions, given a training assignment, department scheduling procedures, instructional resources, facilities and timeline for delivery, so that the specified sessions are delivered according to department procedure. (A) Requisite Knowledge. Departmental scheduling procedures and resource management. (B) Requisite Skills. Training schedule completion.	Yes ☐ No ☐
4.3.2* Review instructional materials, given the materials for a specific topic, target audience, and learning environment, so that elements of the lesson plan, learning environment, and resources that need adaptation are identified. (A) Requisite Knowledge. Recognition of student limitations and cultural diversity, methods of instruction, types of resource materials, organization of the learning environment, and policies and procedures. (B) Requisite Skills. Analysis of resources, facilities, and materials	Yes ☐ No ☐
4.3.3* Adapt a prepared lesson plan, given course materials and an assignment, so that the needs of the student and the objectives of the lesson plan are achieved. (A)* Requisite Knowledge. Elements of a lesson plan, selection of instructional aids and methods, and organization of the learning environment. (B) Requisite Skills. Instructor preparation and organizational skills.	Yes ☐ No ☐
4.4.1 Definition of Duty. The delivery of instructional sessions utilizing prepared course materials.	
4.4.2 Organize the classroom, laboratory, or outdoor learning environment, given a facility and an assignment, so that lighting, distractions, climate control or weather, noise control, seating, audiovisual equipment, teaching aids, and safety are considered. (A) Requisite Knowledge. Classroom management and safety, advantages and limitations of audiovisual equipment and teaching aids, classroom arrangement, and methods and techniques of instruction. (B) Requisite Skills. Use of instructional media and teaching aids.	Yes ☐ No ☐
4.4.3 Present prepared lessons, given a prepared lesson plan that specifies the presentation method(s), so that the method(s) indicated in the plan are used and the stated objectives or learning outcomes are achieved, applicable safety standards and practices are followed, and risks are addressed. (A)* Requisite Knowledge. The laws and principles of learning, methods and techniques of instruction, lesson plan components and elements of the communication process, and lesson plan terminology and definitions; the impact of cultural differences on instructional delivery; safety rules, regulations, and practices; identification of training hazards; elements and limitations of distance learning; distance learning delivery methods; and the instructor's role in distance learning. (B) Requisite Skills. Oral communication techniques, methods and techniques of instruction, and utilization of lesson plans in an instructional setting.	Yes ☐ No ☐

Train the Trainer	Competency Met
4.4.4* Adjust presentation, given a lesson plan and changing circumstances in the class environment, so that class continuity and the objectives or learning outcomes are achieved. (A) Requisite Knowledge. Methods of dealing with changing circumstances. (B) Requisite Skills. None required	Yes ☐ No ☐
4.5.1* Definition of Duty. The administration and grading of student evaluation instruments.	
4.5.2 Administer oral, written, and performance tests, given the lesson plan, evaluation instruments, and evaluation procedures of the agency, so that bias or discrimination is eliminated the testing is conducted according to procedures, and the security of the materials is maintained. (A) Requisite Knowledge. Test administration, agency policies, laws and policies pertaining to discrimination during training and testing, methods for eliminating testing bias, laws affecting records and disclosure of training information, purposes of evaluation and testing, and performance skills evaluation. (B) Requisite Skills. Use of skills checklists and oral questioning techniques.	Yes ☐ No ☐
4.5.3 Grade student oral, written, or performance tests, given class answer sheets or skills checklists and appropriate answer keys, so the examinations are accurately graded and properly secured. (A) Requisite Knowledge. Grading methods, methods for eliminating bias during grading, and maintaining confidentiality of scores. (B) Requisite Skills. None required.	Yes ☐ No ☐
4.5.5* Provide evaluation feedback to students, given evaluation data, so that the feedback is timely; specific enough for the student to make efforts to modify behavior; and objective, clear, and relevant; also include suggestions based on the data. (A) Requisite Knowledge. Reporting procedures and the interpretation of test results. (B) Requisite Skills. Communication skills and basic coaching.	Yes ☐ No ☐

Exterior Operations – Firefighter	Competency Met
Emergency Scene Traffic NFPA 1001 5.3.3	
5.3.3* Establish and operate in work areas at emergency scenes, given protective equipment, traffic and scene control devices, structure fire and roadway emergency scenes, traffic hazards and downed electrical wires, an assignment, and SOPs, so that procedures are followed, protective equipment is worn, protected work areas are established as directed using traffic and scene control devices, and the fire fighter performs assigned tasks only in established, protected work areas. (A) Requisite Knowledge. Potential hazards involved in operating on emergency scenes including vehicle traffic, utilities, and environmental conditions; proper procedures for dismounting apparatus in traffic; procedures for safe operation at emergency scenes; and the protective equipment available for members' safety on emergency scenes and work zone designations. (B) Requisite Skills. The ability to use personal protective clothing, deploy traffic and scene control devices, dismount apparatus, and operate in the protected work areas as directed.	Yes ☐ No ☐
Safety & Communications NFPA 1001 5.1.1, 5.1.2, 5.2, 5.2.1, 5.2.2, 5.2.3, 5.3.2, 5.3.17, 5.3.18	
5.1 General. For qualification at Level I, the fire fighter candidate shall meet the general knowledge requirements in 5.1.1; the general skill requirements in 5.1.2; the JPRs defined in Sections 5.2 through 5.5 of this standard; and the requirements defined in Chapter 5, Core Competencies for Operations Level Responders, and Section 6.6, Mission-Specific Competencies: Product Control, of NFPA 472, <i>Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents</i>.	Yes ☐ No ☐
5.1.1 General Knowledge Requirements. The organization of the fire department; the role of the Fire Fighter I in the organization; the mission of fire service; the fire department's standard operating procedures (SOPs) and rules and regulations as they apply to the Fire Fighter I; the value of fire and life safety initiatives in support of the fire department mission and to reduce fire fighter line-of-duty injuries and fatalities; the role of other agencies as they relate to the fire department; aspects of the fire department's member assistance program; the importance of physical fitness and a healthy lifestyle to the performance of the duties of a fire fighter; the critical aspects of NFPA1500, <i>Standard on Fire Department Occupational Safety and Health Program</i>.	Yes ☐ No ☐
5.1.2 General Skill Requirements. The ability to don personal protective clothing, doff personal protective clothing and prepare for reuse, hoist tools and equipment using ropes and the correct knot, and locate information in departmental documents and standard or code materials.	Yes ☐ No ☐
5.2 Fire Department Communications. This duty shall involve initiating responses, receiving telephone calls, and using fire department communications equipment to correctly relay verbal or written information, according to the JPRs in 5.2.1 through 5.2.4.	
5.2.1* Initiate the response to a reported emergency, given the report of an emergency, fire department SOPs, and communications equipment, so that all necessary information is obtained, communications equipment is operated correctly, and the information is relayed promptly and accurately to the dispatch center. (A) Requisite Knowledge. Procedures for reporting an emergency; departmental SOPs for taking and receiving alarms, radio codes, or procedures; and information needs of dispatch center. (B) Requisite Skills. The ability to operate fire department communications equipment, relay information, and record information.	Yes ☐ No ☐
5.2.2 Receive a telephone call, given a fire department phone, so that procedures for answering the phone are used and the caller's information is relayed. (A) Requisite Knowledge. Fire department procedures for answering nonemergency telephone calls. (B) Requisite Skills. The ability to operate fire station telephone and intercom equipment.	Yes ☐ No ☐

Exterior Operations – Firefighter	Competency Met
5.2.3 Transmit and receive messages via the fire department radio, given a fire department radio and operating procedures, so that the information is accurate, complete, clear, and relayed within the time established by the AHJ. (A) Requisite Knowledge. Departmental radio procedures and etiquette for routine traffic, emergency traffic, and emergency evacuation signals. (B) Requisite Skills. The ability to operate radio equipment and discriminate between routine and emergency traffic.	Yes ☐ No ☐
5.3.2* Respond on apparatus to an emergency scene, given personal protective clothing and other necessary personal protective equipment, so that the apparatus is correctly mounted and dismounted, seat belts are used while the vehicle is in motion, and other personal protective equipment is correctly used. (A) Requisite Knowledge. Mounting and dismounting procedures for riding fire apparatus, hazards and ways to avoid hazards associated with riding apparatus, prohibited practices, and types of department personal protective equipment and the means for usage. (B) Requisite Skills. The ability to use each piece of provided safety equipment.	Yes ☐ No ☐
5.3.17 Illuminate the emergency scene, given fire service electrical equipment and an assignment, so that designated areas are illuminated and all equipment is operated within the manufacturer's listed safety precautions. (A) Requisite Knowledge. Safety principles and practices, power supply capacity and limitations, and light deployment methods. supply and lighting equipment, deploy cords and connectors, reset ground-fault interrupter (GFI) devices, and locate lights for best effect.	Yes ☐ No ☐
5.3.18 Turn off building utilities, given tools and an assignment, so that the assignment is safely completed. (A) Requisite Knowledge. Properties, principles, and safety concerns for electricity, gas, and water systems; utility disconnect methods and associated dangers; and use of required safety equipment. (B) Requisite Skills. The ability to identify utility control devices, operate control valves or switches, and assess for related hazards.	Yes ☐ No ☐
PPE and Self Contained Breathing Apparatus NFPA 1001 5.1.2, 5.2, 5.3, 5.3.1, 5.3.2, 5.5.1	
5.1.2 General Skill Requirements. The ability to don personal protective clothing, doff personal protective clothing and prepare for reuse, hoist tools and equipment using ropes and the correct knot, and locate information in departmental documents and standard or code materials.	Yes ☐ No ☐
5.2 Fire Department Communications. This duty shall involve initiating responses, receiving telephone calls, and using fire department communications equipment to correctly relay verbal or written information, according to the JPRs in 5.2.1 through 5.2.4.	Yes ☐ No ☐
5.3 Fireground Operations. This duty shall involve performing activities necessary to ensure life safety, fire control, and property conservation, according to the JPRs in 5.3.1 through 5.3.20.	
5.3.1* Use self-contained breathing apparatus (SCBA) during emergency operations, given SCBA and other personal protective equipment, so that the SCBA is correctly donned, the SCBA is correctly worn, controlled breathing techniques are used, emergency procedures are enacted if the SCBA fails, all low-air warnings are recognized, respiratory protection is not intentionally compromised, and hazardous areas are exited prior to air depletion. (A) Requisite Knowledge. Conditions that require respiratory protection, uses and limitations of SCBA, components of SCBA, donning procedures, breathing techniques, indications for and emergency procedures used with SCBA, and physical requirements of the SCBA wearer. (B) Requisite Skills. The ability to control breathing, replace SCBA air cylinders, use SCBA to exit through restricted passages, initiate and complete emergency procedures in the event of SCBA failure or air depletion, and complete donning procedures.	Yes ☐ No ☐

Exterior Operations – Firefighter	Competency Met
5.3.2* Respond on apparatus to an emergency scene, given personal protective clothing and other necessary personal protective equipment, so that the apparatus is correctly mounted and dismounted, seat belts are used while the vehicle is in motion, and other personal protective equipment is correctly used. (A) Requisite Knowledge. Mounting and dismounting procedures for riding fire apparatus, hazards and ways to avoid hazards associated with riding apparatus, prohibited practices, and types of department personal protective equipment and the means for usage. (B) Requisite Skills. The ability to use each piece of provided safety equipment.	Yes ☐ No ☐
5.5.1 Clean and check ladders, ventilation equipment, SCBA, ropes, salvage equipment, and hand tools, given cleaning tools, cleaning supplies, and an assignment, so that equipment is clean and maintained according to manufacturer's or departmental guidelines, maintenance is recorded, and equipment is placed in a ready state or reported otherwise. (A) Requisite Knowledge. Types of cleaning methods for various tools and equipment, correct use of cleaning solvents, and manufacturer's or departmental guidelines for cleaning equipment and tools. (B) Requisite Skills. The ability to select correct tools for various parts and pieces of equipment, follow guidelines, and complete recording and reporting procedures.	Yes ☐ No ☐
Ropes and Knots NFPA 1001 5.1.2, 5.3.20, 5.5.1	
5.1.2 General Skill Requirements. The ability to don personal protective clothing, doff personal protective clothing and prepare for reuse, hoist tools and equipment using ropes and the correct knot, and locate information in departmental documents and standard or code materials.	Yes ☐ No ☐
5.3.20 Tie a knot appropriate for hoisting tool, given personnel protective equipment, tools, ropes, and an assignment, so that the knots used are appropriate for hoisting tools securely and as directed. (A) Requisite Knowledge. Knot types and usage; the difference between life safety and utility rope; reasons for placing rope out of service; the types of knots to use for given tools, ropes, or situations; hoisting methods for tools and equipment; and using rope to support response activities. (B) Requisite Skills. The ability to hoist tools using specific knots based on the type of tool.	Yes ☐ No ☐
5.5.1 Clean and check ladders, ventilation equipment, SCBA, ropes, salvage equipment, and hand tools, given cleaning tools, cleaning supplies, and an assignment, so that equipment is clean and maintained according to manufacturer's or departmental guidelines, maintenance is recorded, and equipment is placed in a ready state or reported otherwise. (A) Requisite Knowledge. Types of cleaning methods for various tools and equipment, correct use of cleaning solvents, and manufacturer's or departmental guidelines for cleaning equipment and tools. (B) Requisite Skills. The ability to select correct tools for various parts and pieces of equipment, follow guidelines, and complete recording and reporting procedures.	Yes ☐ No ☐

Exterior Operations – Firefighter	Competency Met
Fire Streams, Hose and Appliances NFPA 1001 5.3.7, 5.3.8, 5.5.1, 5.5.2	
5.3.7* Attack a passenger vehicle fire operating as a member of a team, given personal protective equipment, attack line, and hand tools, so that hazards are avoided, leaking flammable liquids are identified and controlled, protection from flash fires is maintained, all vehicle compartments are overhauled, and the fire is extinguished. (A) Requisite Knowledge. Principles of fire streams as they relate to fighting automobile fires; precautions to be followed when advancing hose lines toward an automobile; observable results that a fire stream has been properly applied; identifying alternative fuels and the hazards associated with them; dangerous conditions created during an automobile fire; common types of accidents or injuries related to fighting automobile fires and how to avoid them; how to access locked passenger, trunk, and engine compartments; and methods for overhauling an automobile. (B) Requisite Skills. The ability to identify automobile fuel type; assess and control fuel leaks; open, close, and adjust the flow and pattern on nozzles; apply water for maximum effectiveness while maintaining flash fire protection; advance 1½ in. (38 mm) or larger diameter attack lines; and expose hidden fires by opening all automobile compartments. in stacked or piled and small unattached structures or storage containers that can be fought from the exterior, attack lines, hand tools and master stream devices, and an assignment, so that exposures are protected, the spread of fire is stopped, collapse hazards are avoided, water application is effective, the fire is extinguished, and signs of the origin area(s) and arson are preserved.	Yes ☐ No ☐
5.3.8* Extinguish fires in exterior Class A materials, given fires in stacked or piled and small unattached structures or storage containers that can be fought from the exterior, attack lines, hand tools and master stream devices, and an assignment, so that exposures are protected, the spread of fire is stopped, collapse hazards are avoided, water application is effective, the fire is extinguished, and signs of the origin area(s) and arson are preserved. (A) Requisite Knowledge. Types of attack lines and water streams appropriate for attacking stacked, piled materials and outdoor fires; dangers — such as collapse — associated with stacked and piled materials; various extinguishing agents and their effect on different material configurations; tools and methods to use in breaking up various types of materials; the difficulties related to complete extinguishment of stacked and piled materials; water application methods for exposure protection and fire extinguishment; dangers such as exposure to toxic or hazardous materials associated with storage building and container fires; obvious signs of origin and cause; and techniques for the preservation of fire cause evidence. (B) Requisite Skills. The ability to recognize inherent hazards related to the material's configuration, operate handlines or master streams, break up material using hand tools and water streams, evaluate for complete extinguishment, operate hose lines and other water application devices, evaluate and modify water application for maximum penetration, search for and expose hidden fires, assess patterns for origin determination, and evaluate for complete extinguishment	Yes ☐ No ☐
5.5.1 Clean and check ladders, ventilation equipment, SCBA, ropes, salvage equipment, and hand tools, given cleaning tools, cleaning supplies, and an assignment, so that equipment is clean and maintained according to manufacturer's or departmental guidelines, maintenance is recorded, and equipment is placed in a ready state or reported otherwise. (A) Requisite Knowledge. Types of cleaning methods for various tools and equipment, correct use of cleaning solvents, and manufacturer's or departmental guidelines for cleaning equipment and tools. (B) Requisite Skills. The ability to select correct tools for various parts and pieces of equipment, follow guidelines, and complete recording and reporting procedures.	Yes ☐ No ☐
5.5.2 Clean, inspect, and return fire hose to service, given washing equipment, water, detergent, tools, and replacement gaskets, so that damage is noted and corrected, the hose is clean, and the equipment is placed in a ready state for service. (A) Requisite Knowledge. Departmental procedures for noting a defective hose and removing it from service, cleaning methods, and hose rolls and loads. (B) Requisite Skills. The ability to clean different types of hose; operate hose washing and drying equipment; mark defective hose; and replace coupling gaskets, roll hose, and reload hose.	Yes ☐ No ☐

Exterior Operations – Firefighter	Competency Met
Ventilation NFPA 1001 5.3.11, 5.5.1	
5.3.11 Perform horizontal ventilation on a structure operating as part of a team, given an assignment, personal protective equipment, ventilation tools, equipment, and ladders, so that the ventilation openings are free of obstructions, tools are used as designed, ladders are correctly placed, ventilation devices are correctly placed, and the structure is cleared of smoke. (A) Requisite Knowledge. The principles, advantages, limitations, and effects of horizontal, mechanical, and hydraulic ventilation; safety considerations when venting a structure; fire behavior in a structure; the products of combustion found in a structure fire; the signs, causes, effects, and prevention of backdrafts; and the relationship of oxygen concentration to life safety and fire growth. (B) Requisite Skills. The ability to transport and operate ventilation tools and equipment and ladders, and to use safe procedures for breaking window and door glass and removing obstructions	Yes ☐ No ☐
5.5.1 Clean and check ladders, ventilation equipment, SCBA, ropes, salvage equipment, and hand tools, given cleaning tools, cleaning supplies, and an assignment, so that equipment is clean and maintained according to manufacturer's or departmental guidelines, maintenance is recorded, and equipment is placed in a ready state or reported otherwise. (A) Requisite Knowledge. Types of cleaning methods for various tools and equipment, correct use of cleaning solvents, and manufacturer's or departmental guidelines for cleaning equipment and tools. (B) Requisite Skills. The ability to select correct tools for various parts and pieces of equipment, follow guidelines, and complete recording and reporting procedures.	Yes ☐ No ☐
Water Supply NFPA 1001 5.3.15, 5.5.1, 5.5.2	
5.3.15* Connect a fire department pumper to a water supply as a member of a team, given supply or intake hose, hose tools, and a fire hydrant or static water source, so that connections are tight and water flow is unobstructed. (A) Requisite Knowledge. Loading and off-loading procedures for mobile water supply apparatus; fire hydrant operation; and suitable static water supply sources, procedures, and protocol for connecting to various water sources. (B) Requisite Skills. The ability to hand lay a supply hose, connect and place hard suction hose for drafting operations, deploy portable water tanks as well as the equipment necessary to transfer water between and draft from them, make hydrant-to-pumper hose connections for forward and reverse lays, connect supply hose to a hydrant, and fully open and close the hydrant.	Yes ☐ No ☐
5.5.1 Clean and check ladders, ventilation equipment, SCBA, ropes, salvage equipment, and hand tools, given cleaning tools, cleaning supplies, and an assignment, so that equipment is clean and maintained according to manufacturer's or departmental guidelines, maintenance is recorded, and equipment is placed in a ready state or reported otherwise. (A) Requisite Knowledge. Types of cleaning methods for various tools and equipment, correct use of cleaning solvents, and manufacturer's or departmental guidelines for cleaning equipment and tools. (B) Requisite Skills. The ability to select correct tools for various parts and pieces of equipment, follow guidelines, and complete recording and reporting procedures	Yes ☐ No ☐
5.5.2 Clean, inspect, and return fire hose to service, given washing equipment, water, detergent, tools, and replacement gaskets, so that damage is noted and corrected, the hose is clean, and the equipment is placed in a ready state for service. (A) Requisite Knowledge. Departmental procedures for noting a defective hose and removing it from service, cleaning methods, and hose rolls and loads. (B) Requisite Skills. The ability to clean different types of hose; operate hose washing and drying equipment; mark defective hose; and replace coupling gaskets, roll hose, and reload hose.	Yes ☐ No ☐

Exterior Operations – Firefighter	Competency Met
Ladders NFPA 1001 5.3.6, 5.5.1	
5.3.6* Set up ground ladders, given single and extension ladders, an assignment, and team members if needed, so that hazards are assessed, the ladder is stable, the angle is correct for climbing, extension ladders are extended to the necessary height with the fly locked, the top is placed against a reliable structural component, and the assignment is accomplished. (A) Requisite Knowledge. Parts of a ladder, hazards associated with setting up ladders, what constitutes a stable foundation for ladder placement, different angles for various tasks, safety limits to the degree of angulation, and what constitutes a reliable structural component for top placement. (B) Requisite Skills. The ability to carry ladders, raise ladders, extend ladders and lock flies, determine that a wall and roof will support the ladder, judge extension ladder height requirements, and place the ladder to avoid obvious hazards.	Yes ☐ No ☐
5.5.1 Clean and check ladders, ventilation equipment, SCBA, ropes, salvage equipment, and hand tools, given cleaning tools, cleaning supplies, and an assignment, so that equipment is clean and maintained according to manufacturer's or departmental guidelines, maintenance is recorded, and equipment is placed in a ready state or reported otherwise. (A) Requisite Knowledge. Types of cleaning methods for various tools and equipment, correct use of cleaning solvents, and manufacturer's or departmental guidelines for cleaning equipment and tools. (B) Requisite Skills. The ability to select correct tools for various parts and pieces of equipment, follow guidelines, and complete recording and reporting procedures.	Yes ☐ No ☐
Rehabilitation Area (REHAB) NFPA 1001 5.1.1, NFPA 1500, NFPA 1584	
5.1.1 General Knowledge Requirements. The organization of the fire department; the role of the Fire Fighter I in the organization; the mission of fire service; the fire department's standard operating procedures (SOPs) and rules and regulations as they apply to the Fire Fighter I; the value of fire and life safety initiatives in support of the fire department mission and to reduce fire fighter line-of-duty injuries and fatalities; the role of other agencies as they relate to the fire department; aspects of the fire department's member assistance program; the importance of physical fitness and a healthy lifestyle to the performance of the duties of a fire fighter; the critical aspects of NFPA1500, <i>Standard on Fire Department Occupational Safety and Health Program</i>.	Yes ☐ No ☐
+ NFPA 1500 Standard on Occupational Safety and Health Program	Yes ☐ No ☐
+ NFPA 1584 Standard on the Rehabilitation Process for Members During Emergency Operations and Training Exercises	Yes ☐ No ☐
Introduction to Basic Fire Behavior and Building Construction NFPA 220, NFPA 921, NFPA 1001 5.3.11, 5.3.12, 5.3.13 NFPA 5000	
5.3.11 Perform horizontal ventilation on a structure operating as part of a team, given an assignment, personal protective equipment, ventilation tools, equipment, and ladders, so that the ventilation openings are free of obstructions, tools are used as designed, ladders are correctly placed, ventilation devices are correctly placed, and the structure is cleared of smoke. (A) Requisite Knowledge. The principles, advantages, limitations, and effects of horizontal, mechanical, and hydraulic ventilation; safety considerations when venting a structure; fire behavior in a structure; the products of combustion found in a structure fire; the signs, causes, effects, and prevention of backdrafts; and the relationship of oxygen concentration to life safety and fire growth. (B) Requisite Skills. The ability to transport and operate ventilation tools and equipment and ladders, and to use safe procedures for breaking window and door glass and removing obstructions.	Yes ☐ No ☐

Exterior Operations – Firefighter	Competency Met
5.3.12 Perform vertical ventilation on a structure as part of a team, given an assignment, personal protective equipment, ground and roof ladders, and tools, so that ladders are positioned for ventilation, a specified opening is created, all ventilation barriers are removed, structural integrity is not compromised, products of combustion are released from the structure, and the team retreats from the area when ventilation is accomplished. (A) Requisite Knowledge. The methods of heat transfer; the principles of thermal layering within a structure on fire; the techniques and safety precautions for venting flat roofs, pitched roofs, and basements; basic indicators of potential collapse or roof failure; the effects of construction type and elapsed time under fire conditions on structural integrity; and the advantages and disadvantages of vertical and trench/strip ventilation. (B) Requisite Skills. The ability to transport and operate ventilation tools and equipment; hoist ventilation tools to a roof; cut roofing and flooring materials to vent flat roofs, pitched roofs, and basements; sound a roof for integrity; clear an opening with hand tools; select, carry, deploy, and secure ground ladders for ventilation activities; deploy roof ladders on pitched roofs while secured to a ground ladder; and carry ventilation-related tools and equipment while ascending and descending ladders.	Yes ☐ No ☐
5.3.13 Overhaul a fire scene, given personal protective equipment, attack line, hand tools, a flashlight, and an assignment, so that structural integrity is not compromised, all hidden fires are discovered, fire cause evidence is preserved, and the fire is extinguished. (A) Requisite Knowledge. Types of fire attack lines and water application devices most effective for overhaul, water application methods for extinguishment that limit water damage, types of tools and methods used to expose hidden fire, dangers associated with overhaul, obvious signs of area of origin or signs of arson, and reasons for protection of fire scene. (B) Requisite Skills. The ability to deploy and operate an attack line; remove flooring, ceiling, and wall components to expose void spaces without compromising structural integrity; apply water for maximum effectiveness; expose and extinguish hidden fires in walls, ceilings, and subfloor spaces; recognize and preserve obvious signs of area of origin and arson; and evaluate for complete extinguishment.	Yes ☐ No ☐
+ NFPA 220 Standard on Types of Building Construction	Yes ☐ No ☐
+ NFPA 921 Guide for Fire and Explosion Investigations	Yes ☐ No ☐
+ NFPA 5000 Building Construction and Safety Code	Yes ☐ No ☐
Dangerous Goods or Hazmat Awareness (from NFPA 472) Can utilize any training provider, including internal, that meets the competencies of NFPA 472 – Awareness Level [Playbook: Page 16, note 1]	Yes ☐ No ☐
Gas & Electrical Safety for Firefighters (supplied by a BC Utility utilizing an evaluation mechanism) Can utilize any program, developed by a registered Gas or Electrical Utility within the Province of BC, which includes an evaluation instrument based upon current recommended practice [Playbook: Page 16, note 2]	Yes ☐ No ☐
Incident Command System 100 (from BCERMS curriculum) Can utilize any training provider, including internal, using certified training and evaluation based upon the BCERMS model. [Playbook: Page 16, note 3]	Yes ☐ No ☐

Interior Operations – Firefighter	Competency Met
All of Exterior Operations Firefighter PLUS the following:	Yes ☐ No ☐
Organization, Safety and Communications NFPA 1001 5.2.4	
5.2.4* Activate an emergency call for assistance, given vision obscured conditions, PPE, and department SOPs, so that the fire fighter can be located and rescued. (A) Requisite Knowledge. Personnel accountability systems, emergency communication procedures, and emergency evacuation methods. (B) Requisite Skills. The ability to initiate an emergency call for assistance in accordance with the AHJ's procedures, the ability to use other methods of emergency calls for assistance.	Yes ☐ No ☐
RIT Training – pertinent to jurisdictional hazards NFPA 1001 5.3.9 NFPA 1407, NFPA 1500	
5.3.9* Conduct a search and rescue in a structure operating as a member of a team, given an assignment, obscured vision conditions, personal protective equipment, a flashlight, forcible entry tools, hose lines, and ladders when necessary, so that ladders are correctly placed when used, all assigned areas are searched, all victims are located and removed, team integrity is maintained, and team members' safety — including respiratory protection — is not compromised. (A) Requisite Knowledge. Use of forcible entry tools during rescue operations, ladder operations for rescue, psychological effects of operating in obscured conditions and ways to manage them, methods to determine if an area is tenable, primary and secondary search techniques, team members' roles and goals, methods to use and indicators of finding victims, victim removal methods (including various carries), and considerations related to respiratory protection. (B)* Requisite Skills. The ability to use SCBA to exit through restricted passages, set up and use different types of ladders for various types of rescue operations, rescue a fire fighter with functioning respiratory protection, rescue a fire fighter whose respiratory protection is not functioning, rescue a person who has no respiratory protection, and assess areas to determine tenability.	Yes ☐ No ☐
+ NFPA 1407 Standard for Training Fire Service Rapid Intervention Crews	Yes ☐ No ☐
+ NFPA 1500 Standard on Fire Department Occupational Safety and Health Program	Yes ☐ No ☐
Self-Contained Breathing Apparatus NFPA 1001 5.3.1, 5.3.5, 5.3.9	
5.3.1* Use self-contained breathing apparatus (SCBA) during emergency operations, given SCBA and other personal protective equipment, so that the SCBA is correctly donned, the SCBA is correctly worn, controlled breathing techniques are used, emergency procedures are enacted if the SCBA fails, all low-air warnings are recognized, respiratory protection is not intentionally compromised, and hazardous areas are exited prior to air depletion. (A) Requisite Knowledge. Conditions that require respiratory protection, uses and limitations of SCBA, components of SCBA, donning procedures, breathing techniques, indications for and emergency procedures used with SCBA, and physical requirements of the SCBA wearer. (B) Requisite Skills. The ability to control breathing, replace SCBA air cylinders, use SCBA to exit through restricted passages, initiate and complete emergency procedures in the event of SCBA failure or air depletion, and complete donning procedures.	Yes ☐ No ☐

Interior Operations – Firefighter	Competency Met
5.3.5* Exit a hazardous area as a team, given vision-obscured conditions, so that a safe haven is found before exhausting the air supply, others are not endangered, and the team integrity is maintained. (A) Requisite Knowledge. Personnel accountability systems, communication procedures, emergency evacuation methods, what constitutes a safe haven, elements that create or indicate a hazard, and emergency procedures for loss of air supply. (B) Requisite Skills. The ability to operate as a team member in vision-obscured conditions, locate and follow a guideline, conserve air supply, and evaluate areas for hazards and identify a safe haven.	Yes ☐ No ☐
5.3.9* Conduct a search and rescue in a structure operating as a member of a team, given an assignment, obscured vision conditions, personal protective equipment, a flashlight, forcible entry tools, hose lines, and ladders when necessary, so that ladders are correctly placed when used, all assigned areas are searched, all victims are located and removed, team integrity is maintained, and team members' safety — including respiratory protection — is not compromised. (A) Requisite Knowledge. Use of forcible entry tools during rescue operations, ladder operations for rescue, psychological effects of operating in obscured conditions and ways to manage them, methods to determine if an area is tenable, primary and secondary search techniques, team members' roles and goals, methods to use and indicators of finding victims, victim removal methods (including various carries), and considerations related to respiratory protection. (B)* Requisite Skills. The ability to use SCBA to exit through restricted passages, set up and use different types of ladders for various types of rescue operations, rescue a fire fighter with functioning respiratory protection, rescue a fire fighter whose respiratory protection is not functioning, rescue a person who has no respiratory protection, and assess areas to determine tenability.	Yes ☐ No ☐
Search and Rescue NFPA 1001 5.3.9	
5.3.9* Conduct a search and rescue in a structure operating as a member of a team, given an assignment, obscured vision conditions, personal protective equipment, a flashlight, forcible entry tools, hose lines, and ladders when necessary, so that ladders are correctly placed when used, all assigned areas are searched, all victims are located and removed, team integrity is maintained, and team members' safety — including respiratory protection — is not compromised. (A) Requisite Knowledge. Use of forcible entry tools during rescue operations, ladder operations for rescue, psychological effects of operating in obscured conditions and ways to manage them, methods to determine if an area is tenable, primary and secondary search techniques, team members' roles and goals, methods to use and indicators of finding victims, victim removal methods (including various carries), and considerations related to respiratory protection. (B)* Requisite Skills. The ability to use SCBA to exit through restricted passages, set up and use different types of ladders for various types of rescue operations, rescue a fire fighter with functioning respiratory protection, rescue a fire fighter whose respiratory protection is not functioning, rescue a person who has no respiratory protection, and assess areas to determine tenability.	Yes ☐ No ☐
Fire Behavior NFPA 1001	Yes ☐ No ☐

Interior Operations – Firefighter	Competency Met
Fire Extinguishers NFPA 1001 5.3.16	
5.3.16* Extinguish incipient Class A, Class B, and Class C fires, given a selection of portable fire extinguishers, so that the correct extinguisher is chosen, the fire is completely extinguished, and correct extinguisher-handling techniques are followed. (A) Requisite Knowledge. The classifications of fire; the types of, rating systems for, and risks associated with each class of fire; and the operating methods of and limitations of portable extinguishers. (B) Requisite Skills. The ability to operate portable fire extinguishers, approach fire with portable fire extinguishers, select an appropriate extinguisher based on the size and type of fire, and safely carry portable fire extinguishers.	Yes ☐ No ☐
Building Construction NFPA 1001 5.3.11, 5.3.12	
5.3.11 Perform horizontal ventilation on a structure operating as part of a team, given an assignment, personal protective equipment, ventilation tools, equipment, and ladders, so that the ventilation openings are free of obstructions, tools are used as designed, ladders are correctly placed, ventilation devices are correctly placed, and the structure is cleared of smoke. (A) Requisite Knowledge. The principles, advantages, limitations, and effects of horizontal, mechanical, and hydraulic ventilation; safety considerations when venting a structure; fire behavior in a structure; the products of combustion found in a structure fire; the signs, causes, effects, and prevention of backdrafts; and the relationship of oxygen concentration to life safety and fire growth. (B) Requisite Skills. The ability to transport and operate ventilation tools and equipment and ladders, and to use safe procedures for breaking window and door glass and removing obstructions.	Yes ☐ No ☐
5.3.12 Perform vertical ventilation on a structure as part of a team, given an assignment, personal protective equipment, ground and roof ladders, and tools, so that ladders are positioned for ventilation, a specified opening is created, all ventilation barriers are removed, structural integrity is not compromised, products of combustion are released from the structure, and the team retreats from the area when ventilation is accomplished. (A) Requisite Knowledge. The methods of heat transfer; the principles of thermal layering within a structure on fire; the techniques and safety precautions for venting flat roofs, pitched roofs, and basements; basic indicators of potential collapse or roof failure; the effects of construction type and elapsed time under fire conditions on structural integrity; and the advantages and disadvantages of vertical and trench/strip ventilation. (B) Requisite Skills. The ability to transport and operate ventilation tools and equipment; hoist ventilation tools to a roof; cut roofing and flooring materials to vent flat roofs, pitched roofs, and basements; sound a roof for integrity; clear an opening with hand tools; select, carry, deploy, and secure ground ladders for ventilation activities; deploy roof ladders on pitched roofs while secured to a ground ladder; and carry ventilation-related tools and equipment while ascending and descending ladders.	Yes ☐ No ☐
Forcible Entry NFPA 1001 5.3.4	
5.3.4* Force entry into a structure, given personal protective equipment, tools, and an assignment, so that the tools are used as designed, the barrier is removed, and the opening is in a safe condition and ready for entry. (A) Requisite Knowledge. Basic construction of typical doors, windows, and walls within the department's community or service area; operation of doors, windows, and locks; and the dangers associated with forcing entry through doors, windows, and walls. (B) Requisite Skills. The ability to transport and operate hand and power tools and to force entry through doors, windows, and walls using assorted methods and tools.	Yes ☐ No ☐

Interior Operations – Firefighter	Competency Met
Ventilation NFPA 1001 5.3.12	
5.3.12 Perform vertical ventilation on a structure as part of a team, given an assignment, personal protective equipment, ground and roof ladders, and tools, so that ladders are positioned for ventilation, a specified opening is created, all ventilation barriers are removed, structural integrity is not compromised, products of combustion are released from the structure, and the team retreats from the area when ventilation is accomplished. (A) Requisite Knowledge. The methods of heat transfer; the principles of thermal layering within a structure on fire; the techniques and safety precautions for venting flat roofs, pitched roofs, and basements; basic indicators of potential collapse or roof failure; the effects of construction type and elapsed time under fire conditions on structural integrity; and the advantages and disadvantages of vertical and trench/strip ventilation. (B) Requisite Skills. The ability to transport and operate ventilation tools and equipment; hoist ventilation tools to a roof; cut roofing and flooring materials to vent flat roofs, pitched roofs, and basements; sound a roof for integrity; clear an opening with hand tools; select, carry, deploy, and secure ground ladders for ventilation activities; deploy roof ladders on pitched roofs while secured to a ground ladder; and carry ventilation-related tools and equipment while ascending and descending ladders.	Yes ☐ No ☐
Loss Control NFPA 1001 5.3.13, 5.3.14	
5.3.13 Overhaul a fire scene, given personal protective equipment, attack line, hand tools, a flashlight, and an assignment, so that structural integrity is not compromised, all hidden fires are discovered, fire cause evidence is preserved, and the fire is extinguished. (A) Requisite Knowledge. Types of fire attack lines and water application devices most effective for overhaul, water application methods for extinguishment that limit water damage, types of tools and methods used to expose hidden fire, dangers associated with overhaul, obvious signs of area of origin or signs of arson, and reasons for protection of fire scene. (B) Requisite Skills. The ability to deploy and operate an attack line; remove flooring, ceiling, and wall components to expose void spaces without compromising structural integrity; apply water for maximum effectiveness; expose and extinguish hidden fires in walls, ceilings, and subfloor spaces; recognize and preserve obvious signs of area of origin and arson; and evaluate for complete extinguishment.	Yes ☐ No ☐
5.3.14 Conserve property as a member of a team, given salvage tools and equipment and an assignment, so that the building and its contents are protected from further damage. (A) Requisite Knowledge. The purpose of property conservation and its value to the public, methods used to protect property, types of and uses for salvage covers, operations at properties protected with automatic sprinklers, how to stop the flow of water from an automatic sprinkler head, identification of the main control valve on an automatic sprinkler system, forcible entry issues related to salvage, and procedures for protecting possible areas of origin and potential evidence. (B) Requisite Skills. The ability to cluster furniture; deploy covering materials; roll and fold salvage covers for reuse; construct water chutes and catch-alls; remove water; cover building openings, including doors, windows, floor openings, and roof openings; separate, remove, and relocate charred material to a safe location while protecting the area of origin for cause determination; stop the flow of water from a sprinkler with sprinkler wedges or stoppers; and operate a main control valve on an automatic sprinkler system.	Yes ☐ No ☐

Interior Operations – Firefighter	Competency Met
Live Fire Exterior NFPA 1001 5.3.7, 5.3.8, 5.3.10, 5.3.19	
5.3.7* Attack a passenger vehicle fire operating as a member of a team, given personal protective equipment, attack line, and hand tools, so that hazards are avoided, leaking flammable liquids are identified and controlled, protection from flash fires is maintained, all vehicle compartments are overhauled, and the fire is extinguished. (A) Requisite Knowledge. Principles of fire streams as they relate to fighting automobile fires; precautions to be followed when advancing hose lines toward an automobile; observable results that a fire stream has been properly applied; identifying alternative fuels and the hazards associated with them; dangerous conditions created during an automobile fire; common types of accidents or injuries related to fighting automobile fires and how to avoid them; how to access locked passenger, trunk, and engine compartments; and methods for overhauling an automobile. (B) Requisite Skills. The ability to identify automobile fuel type; assess and control fuel leaks; open, close, and adjust the flow and pattern on nozzles; apply water for maximum effectiveness while maintaining flash fire protection; advance 1½ in. (38 mm) or larger diameter attack lines; and expose hidden fires by opening all automobile compartments.	Yes ☐ No ☐
5.3.8* Extinguish fires in exterior Class A materials, given fires in stacked or piled small unattached structures or storage containers that can be fought from the exterior, attack lines, hand tools and master stream devices, and an assignment, so that exposures are protected, the spread of fire is stopped, collapse hazards are avoided, water application is effective, the fire is extinguished, and signs of the origin area(s) and arson are preserved. (A) Requisite Knowledge. Types of attack lines and water streams appropriate for attacking stacked, piled materials and outdoor fires; dangers — such as collapse — associated with stacked and piled materials; various extinguishing agents and their effect on different material configurations; tools and methods to use in breaking up various types of materials; the difficulties related to complete extinguishment of stacked and piled materials; water application methods for exposure protection and fire extinguishment; dangers such as exposure to toxic or hazardous materials associated with storage building and container fires; obvious signs of origin and cause; and techniques for the preservation of fire cause evidence. (B) Requisite Skills. The ability to recognize inherent hazards related to the material's configuration, operate handlines or master streams, break up material using hand tools and water streams, evaluate for complete extinguishment, operate hose lines and other water application devices, evaluate and modify water application for maximum penetration, search for and expose hidden fires, assess patterns for origin determination, and evaluate for complete extinguishment.	Yes ☐ No ☐

Interior Operations – Firefighter	Competency Met
5.3.10* Attack an interior structure fire operating as a member of a team, given an attack line, ladders when needed, personal protective equipment, tools, and an assignment, so that team integrity is maintained, the attack line is deployed for advancement, ladders are correctly placed when used, access is gained into the fire area, effective water application practices are used, the fire is approached correctly, attack techniques facilitate suppression given the level of the fire, hidden fires are located and controlled, the correct body posture is maintained, hazards are recognized and managed, and the fire is brought under control. (A) Requisite Knowledge. Principles of fire streams; types, design, operation, nozzle pressure effects, and flow capabilities of nozzles; precautions to be followed when advancing hose lines to a fire; observable results that a fire stream has been properly applied; dangerous building conditions created by fire; principles of exposure protection; potential longterm consequences of exposure to products of combustion; physical states of matter in which fuels are found; common types of accidents or injuries and their causes; and the application of each size and type of attack line, the role of the backup team in fire attack situations, attack and control techniques for grade level and above and below grade levels, and exposing hidden fires. (B) Requisite Skills. The ability to prevent water hammers when shutting down nozzles; open, close, and adjust nozzle flow and patterns; apply water using direct, indirect, and combination attacks; advance charged and uncharged 1½ in. (38 mm) diameter or larger hose lines up ladders and up and down interior and exterior stairways; extend hose lines; replace burst hose sections; operate charged hose lines of 1½ in. (38 mm) diameter or larger while secured to a ground ladder; couple and uncouple various handline connections; carry hose; attack fires at grade level and above and below grade levels; and locate and suppress interior wall and subfloor fires.	Yes ☐ No ☐
5.3.19* Combat a ground cover fire operating as a member of a team, given protective clothing, SCBA (if needed), hose lines, extinguishers or hand tools, and an assignment, so that threats to property are reported, threats to personal safety are recognized, retreat is quickly accomplished when warranted, and the assignment is completed. (A) Requisite Knowledge. Types of ground cover fires, parts of ground cover fires, methods to contain or suppress, and safety principles and practices. (B) Requisite Skills. The ability to determine exposure threats based on fire spread potential, protect exposures, construct a fire line or extinguish with hand tools, maintain integrity of established fire lines, and suppress ground cover fires using water.	Yes ☐ No ☐

Full Service Operations – Firefighter	Competency Met
All of NFPA 1001 – FF2 Competencies (except Hazmat and Medical Response) and with the addition of:	Yes ☐ No ☐
Live Fire Exterior and Interior	Yes ☐ No ☐
Hazmat Operations (<i>NFPA core competencies plus 6.6.1.1.2</i>)	Yes ☐ No ☐
6.6.1.1.2 The operations level responder assigned to perform product control at hazardous materials/ WMD incidents shall be trained to meet all competencies at the awareness level (<i>see Chapter 4</i>), all core competencies at the operations level (<i>see Chapter 5</i>), all mission-specific competencies for personal protective equipment (<i>see Section 6.2</i>), and all competencies in this section.	Yes ☐ No ☐

Team Leader Exterior & Interior	Competency Met
Can utilize any training provider, including internal, that meets the competencies of NFPA 1021 – Fire Officer Professional Qualifications [Playbook: Page 16, note 3] Completion of the Operational Firefighter requirements for either the Exterior or Interior Service Level PLUS the following Competencies from NFPA 1021:	Yes ☐ No ☐
Incident Command and Fire Attack NFPA 1021 4.1.1, 4.2.1, 4.2.2, 4.2.3	
4.1.1* General Prerequisite Knowledge. The organizational structure of the department; geographical configuration and characteristics of response districts; departmental operating procedures for administration, emergency operations, incident management system and safety; fundamentals of leadership; departmental budget process; information management and recordkeeping; the fire prevention and building safety codes and ordinances applicable to the jurisdiction; current trends, technologies, and socioeconomic and political factors that affect the fire service; cultural diversity; methods used by supervisors to obtain cooperation within a group of subordinates; the rights of management and members; agreements in force between the organization and members; generally accepted ethical practices, including a professional code of ethics; and policies and procedures regarding the operation of the department as they involve supervisors and members.	Yes ☐ No ☐
4.2.1 Assign tasks or responsibilities to unit members, given an assignment at an emergency incident, so that the instructions are complete, clear, and concise; safety considerations are addressed; and the desired outcomes are conveyed. (A) Requisite Knowledge. Verbal communications during emergency incidents, techniques used to make assignments under stressful situations, and methods of confirming understanding. (B) Requisite Skills. The ability to condense instructions for frequently assigned unit tasks based on training and standard operating procedures.	Yes ☐ No ☐
4.2.2 Assign tasks or responsibilities to unit members, given an assignment under nonemergency conditions at a station or other work location, so that the instructions are complete, clear, and concise; safety considerations are addressed; and the desired outcomes are conveyed. (A) Requisite Knowledge. Verbal communications under nonemergency situations, techniques used to make assignments under routine situations, and methods of confirming understanding. (B) Requisite Skills. The ability to issue instructions for frequently assigned unit tasks based on department policy.	Yes ☐ No ☐
4.2.3 Direct unit members during a training evolution, given a company training evolution and training policies and procedures, so that the evolution is performed in accordance with safety plans, efficiently, and as directed. (A) Requisite Knowledge. Verbal communication techniques to facilitate learning. (B) Requisite Skills. The ability to distribute issue-guided directions to unit members during training evolutions.	Yes ☐ No ☐

Team Leader Exterior & Interior	Competency Met
Pre-Incident Planning, Size-up and Incident Action Planning NFPA 1021 4.5.2, 4.5.3, 4.6, 4.6.1, 4.6.2	
4.5.2 Identify construction, alarm, detection, and suppression features that contribute to or prevent the spread of fire, heat, and smoke throughout the building or from one building to another, given an occupancy, and the policies and forms of the AHJ so that a pre-incident plan for any of the following occupancies is developed: (1) Public assembly (2) Educational (3) Institutional (4) Residential (5) Business (6) Industrial (7) Manufacturing (8) Storage (9) Mercantile (10) Special properties (A) Requisite Knowledge. Fire behavior; building construction; inspection and incident reports; detection, alarm, and suppression systems; and applicable codes, ordinances, and standards. (B) Requisite Skills. The ability to use evaluative methods and to communicate orally and in writing.	Yes ☐ No ☐
4.5.3 Secure an incident scene, given rope or barrier tape, so that unauthorized persons can recognize the perimeters of the scene and are kept from restricted areas, and all evidence or potential evidence is protected from damage or destruction. (A) Requisite Knowledge. Types of evidence, the importance of fire scene security, and evidence preservation. (B) Requisite Skills. The ability to establish perimeters at an incident scene.	Yes ☐ No ☐
4.6* Emergency Service Delivery. This duty involves supervising emergency operations, conducting pre-incident planning, and deploying assigned resources in accordance with the local emergency plan and according to the following job performance requirements.	
4.6.1 Develop an initial action plan, given size-up information for an incident and assigned emergency response resources, so that resources are deployed to control the emergency. (A)* Requisite Knowledge. Elements of a size-up, standard operating procedures for emergency operations, and fire behavior. (B)* Requisite Skills. The ability to analyze emergency scene conditions; to activate the local emergency plan, including localized evacuation procedures; to allocate resources; and to communicate orally.	Yes ☐ No ☐
4.6.2* Implement an action plan at an emergency operation, given assigned resources, type of incident, and a preliminary plan, so that resources are deployed to mitigate the situation. (A) Requisite Knowledge. Standard operating procedures, resources available for the mitigation of fire and other emergency incidents, an incident management system, scene safety, and a personnel accountability system. (B) Requisite Skills. The ability to implement an incident management system, to communicate orally, to manage scene safety, and to supervise and account for assigned personnel under emergency conditions.	Yes ☐ No ☐
Fire Ground Accountability NFPA 1021 4.6.1, 4.6.2	
4.6.1 Develop an initial action plan, given size-up information for an incident and assigned emergency response resources, so that resources are deployed to control the emergency. (A)* Requisite Knowledge. Elements of a size-up, standard operating procedures for emergency operations, and fire behavior. (B)* Requisite Skills. The ability to analyze emergency scene conditions; to activate the local emergency plan, including localized evacuation procedures; to allocate resources; and to communicate orally.	Yes ☐ No ☐

Team Leader Exterior & Interior	Competency Met
4.6.2* Implement an action plan at an emergency operation, given assigned resources, type of incident, and a preliminary plan, so that resources are deployed to mitigate the situation. (A) Requisite Knowledge. Standard operating procedures, resources available for the mitigation of fire and other emergency incidents, an incident management system, scene safety, and a personnel accountability system. (B) Requisite Skills. The ability to implement an incident management system, to communicate orally, to manage scene safety, and to supervise and account for assigned personnel under emergency conditions.	Yes ☐ No ☐
Live Fire – Exterior (<i>Recommended for Exterior Operations</i>) NFPA 1001 5.3.7, 5.3.8, 5.3.10	
5.3.7* Attack a passenger vehicle fire operating as a member of a team, given personal protective equipment, attack line, and hand tools, so that hazards are avoided, leaking flammable liquids are identified and controlled, protection from flash fires is maintained, all vehicle compartments are overhauled, and the fire is extinguished. (A) Requisite Knowledge. Principles of fire streams as they relate to fighting automobile fires; precautions to be followed when advancing hose lines toward an automobile; observable results that a fire stream has been properly applied; identifying alternative fuels and the hazards associated with them; dangerous conditions created during an automobile fire; common types of accidents or injuries related to fighting automobile fires and how to avoid them; how to access locked passenger, trunk, and engine compartments; and methods for overhauling an automobile. (B) Requisite Skills. The ability to identify automobile fuel type; assess and control fuel leaks; open, close, and adjust the flow and pattern on nozzles; apply water for maximum effectiveness while maintaining flash fire protection; advance 1½ in. (38 mm) or larger diameter attack lines; and expose hidden fires by opening all automobile compartments.	Yes ☐ No ☐
5.3.8* Extinguish fires in exterior Class A materials, given fires in stacked or piled and small unattached structures or storage containers that can be fought from the exterior, attack lines, hand tools and master stream devices, and an assignment, so that exposures are protected, the spread of fire is stopped, collapse hazards are avoided, water application is effective, the fire is extinguished, and signs of the origin area(s) and arson are preserved. (A) Requisite Knowledge. Types of attack lines and water streams appropriate for attacking stacked, piled materials and outdoor fires; dangers — such as collapse — associated with stacked and piled materials; various extinguishing agents and their effect on different material configurations; tools and methods to use in breaking up various types of materials; the difficulties related to complete extinguishment of stacked and piled materials; water application methods for exposure protection and fire extinguishment; dangers such as exposure to toxic or hazardous materials associated with storage building and container fires; obvious signs of origin and cause; and techniques for the preservation of fire cause evidence. (B) Requisite Skills. The ability to recognize inherent hazards related to the material's configuration, operate handlines or master streams, break up material using hand tools and water streams, evaluate for complete extinguishment, operate hose lines and other water application devices, evaluate and modify water application for maximum penetration, search for and expose hidden fires, assess patterns for origin determination, and evaluate for complete extinguishment.	Yes ☐ No ☐

Team Leader Exterior & Interior	Competency Met
5.3.10* Attack an interior structure fire operating as a member of a team, given an attack line, ladders when needed, personal protective equipment, tools, and an assignment, so that team integrity is maintained, the attack line is deployed for advancement, ladders are correctly placed when used, access is gained into the fire area, effective water application practices are used, the fire is approached correctly, attack techniques facilitate suppression given the level of the fire, hidden fires are located and controlled, the correct body posture is maintained, hazards are recognized and managed, and the fire is brought under control. (A) Requisite Knowledge. Principles of fire streams; types, design, operation, nozzle pressure effects, and flow capabilities of nozzles; precautions to be followed when advancing hose lines to a fire; observable results that a fire stream has been properly applied; dangerous building conditions created by fire; principles of exposure protection; potential longterm consequences of exposure to products of combustion; physical states of matter in which fuels are found; common types of accidents or injuries and their causes; and the application of each size and type of attack line, the role of the backup team in fire attack situations, attack and control techniques for grade level and above and below grade levels, and exposing hidden fires. (B) Requisite Skills. The ability to prevent water hammers when shutting down nozzles; open, close, and adjust nozzle flow and patterns; apply water using direct, indirect, and combination attacks; advance charged and uncharged 1½ in. (38 mm) diameter or larger hose lines up ladders and up and down interior and exterior stairways; extend hose lines; replace burst hose sections; operate charged hose lines of 1½ in. (38 mm) diameter or larger while secured to a ground ladder; couple and uncouple various handline connections; carry hose; attack fires at grade level and above and below grade levels; and locate and suppress interior wall and subfloor fires.	Yes ☐ No ☐
Live Fire – Exterior & Interior <i>(Recommended for Interior Operations)</i>	Yes ☐ No ☐

Risk Management Officer	Competency Met
Completion of the Team Leader requirements for the Exterior Operations level PLUS the following courses (1 from each area):	Yes ☐ No ☐
EITHER Incident Action Planning NFPA 1021 4.6.1, 4.6.2 Requires a training program with subject matter covering areas such as strategies and tactics, fire ground command and emergency scene management [Playbook: Page 16, note 5]	
4.6.1 Develop an initial action plan, given size-up information for an incident and assigned emergency response resources, so that resources are deployed to control the emergency. (A)* Requisite Knowledge. Elements of a size-up, standard operating procedures for emergency operations, and fire behavior. (B)* Requisite Skills. The ability to analyze emergency scene conditions; to activate the local emergency plan, including localized evacuation procedures; to allocate resources; and to communicate orally.	Yes ☐ No ☐
4.6.2* Implement an action plan at an emergency operation, given assigned resources, type of incident, and a preliminary plan, so that resources are deployed to mitigate the situation. (A) Requisite Knowledge. Standard operating procedures, resources available for the mitigation of fire and other emergency incidents, an incident management system, scene safety, and a personnel accountability system. (B) Requisite Skills. The ability to implement an incident management system, to communicate orally, to manage scene safety, and to supervise and account for assigned personnel under emergency conditions.	Yes ☐ No ☐
OR Incident Safety Officer NFPA 1521 6.1 – 6.7.2 (operational)	Yes ☐ No ☐
6.1 General Functions of the Incident Safety Officer. 6.1.1* The incident safety officer (ISO) shall be integrated with the incident management system (IMS) as a command staff member, as specified in NFPA 1561, <i>Standard on Emergency Services Incident Management System</i>. 6.1.2* Standard operating procedures (SOPs) shall define criteria for the response of a predesignated incident safety officer. 6.1.2.1 If the incident safety officer is designated by the incident commander, the fire department shall establish criteria for appointment based upon 6.1.1. 6.1.3* The incident safety officer and assistant incident safety officer(s) shall be readily identifiable at the incident scene. 6.1.4* Upon arrival or assignment as the incident safety officer at an incident, he or she shall obtain a situation-status briefing from the incident commander, that includes the incident action plan. 6.1.5 The incident safety officer shall monitor the incident action plan, conditions, activities, and operations to determine whether they fall within the criteria as defined in the fire department's risk management plan. 6.1.6 When the perceived risk(s) is not within the fire department's risk management criteria, the incident safety officer shall take action as outlined in Section 4.6. 6.1.7 The incident safety officer shall monitor the incident scene and report to the incident commander the status of conditions, hazards, and risks. 6.1.8 The incident safety officer shall ensure that the fire department's personnel accountability system is being utilized.	

Risk Management Officer	Competency Met
6.1.9* The incident safety officer shall offer judgment to the incident commander on establishing control zones and no entry zones and ensure that established zones are communicated to all members present on the scene. 6.1.10 The incident safety officer shall evaluate motor vehicle incident scene traffic hazards and apparatus placement and take appropriate actions to mitigate hazards as described in Section 8.7 of NFPA 1500, <i>Standard on Fire Department Occupational Safety and Health Program</i>. 6.1.11 The incident safety officer shall monitor radio transmissions and stay alert to transmission barriers that could result in missed, unclear, or incomplete communication. 6.1.12* The incident safety officer shall ensure that the incident commander establishes an incident scene rehabilitation tactical level management component during emergency operations. 6.1.13* The incident safety officer shall communicate to the incident commander the need for assistant incident safety officers and/or technical specialists due to the need, size, complexity, or duration of the incident. 6.1.14 The incident safety officer or assistant incident safety officer shall survey and evaluate the hazards associated with the designation of a landing zone and interface with helicopters. 6.1.15* The incident safety officer shall recognize the potential need for critical incident stress interventions and notify the incident commander of this possibility. 6.1.16 If the incident safety officer or an assistant safety officer needs to enter a hot zone or an environment that is immediately dangerous to life or health (IDLH), the incident safety officer or assistant safety officer shall be paired up with another member and check in with the entry control officer.	
6.2 Fire Suppression. 6.2.1 The incident safety officer shall meet the provisions of Section 6.2 during fire suppression operations. 6.2.2* The incident safety officer shall ensure that a rapid intervention team meeting the criteria in Chapter 8 of NFPA 1500, is available and ready for deployment. 6.2.3 Where fire has involved a building(s) the incident safety officer shall advise the incident commander of hazards, collapse potential, and any fire extension in such building(s). 6.2.4 The incident safety officer shall evaluate visible smoke and fire conditions and advise the incident commander, tactical level management component's (TLMC) officers, and company officers on the potential for flashover, backdraft, blow-up, or other events that could pose a threat to operating teams. 6.2.5 The incident safety officer shall monitor the accessibility of entry and egress of structures and its effect on the safety of members conducting interior operations.	
6.3 Emergency Medical Service Operations. 6.3.1 The incident safety officer shall meet the provisions of Section 6.3 during emergency medical service (EMS) operations. 6.3.2 The incident safety officer shall ensure compliance with the department's infection control plan and NFPA 1581, <i>Standard on Fire Department Infection Control Program</i>, during emergency medical service operations. 6.3.3 The incident safety officer shall ensure that incident scene rehabilitation and critical incident stress management are established as needed at emergency medical service operations, especially mass casualty incidents (MCIs).	
6.4 Technical Rescue. 6.4.1 The incident safety officer shall meet the provisions of Section 6.4 during technical rescue operations. 6.4.2* In cases where a designated incident safety officer does not meet the technician-level requirements of NFPA 1006, <i>Standard for Rescue Technician Professional Qualifications</i>, the	

Risk Management Officer	Competency Met
incident commander shall appoint an assistant incident safety officer or a technical specialist who meets the technician-level requirements of NFPA 1006 to assist with incident safety officer functions. 6.4.3 The incident safety officer shall attend strategic and tactical planning sessions and provide input on risk assessment and member safety. 6.4.4* The incident safety officer shall ensure that a safety briefing is conducted and that an incident action plan and an incident safety plan are developed and made available to all members on the scene.	
6.5 Hazardous Materials Operations. 6.5.1 The incident safety officer shall meet the provisions of Section 6.5 during hazardous materials operations. 6.5.2* In cases where a designated incident safety officer does not meet the technician-level requirements of NFPA 472, <i>Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents</i>, the incident commander shall appoint an assistant incident safety officer or a technical specialist who meets the technician-level requirements of NFPA 472 to assist with incident safety officer functions. 6.5.3 The incident safety officer shall attend strategic and tactical planning sessions and provide input on risk assessment and member safety. 6.5.4* The incident safety officer shall ensure that a safety briefing is conducted and that an incident action plan and an incident safety plan are developed and made available to all members on the scene. 6.5.5 The incident safety officer shall ensure that control zones are clearly marked and communicated to all members.	
6.6 Accident Investigation and Review. 6.6.1 Upon notification of a member injury, illness, or exposure, the incident safety officer shall immediately communicate this information to the incident commander to ensure that emergency medical care is provided. 6.6.2 The incident safety officer shall initiate the accident investigation procedures as required by the fire department. 6.6.3* In the event of a serious injury, fatality, or other potentially harmful occurrence to a member, the incident safety officer shall request assistance from the health and safety officer.	
6.7 Post-Incident Analysis. 6.7.1* The incident safety officer shall prepare a written report for the post-incident analysis that includes pertinent information about the incident relating to health and safety issues. 6.7.2* The incident safety officer shall participate in the post incident analysis.	
EITHER FCABC/LGMA: Effective Fire Service Administration	Yes ☐ No ☐
OR Beyond Hoses and Helmets, or equivalent (<i>administrative</i>)	Yes ☐ No ☐

Company Fire Officer	Competency Met
Fire Officer 1 (NFPA 1021 in its entirety)	Yes ☐ No ☐
Incident Command 200	Yes ☐ No ☐
Fire Service Instructor 1 (NFPA 1041 Chapter 4)	Yes ☐ No ☐
4.1 General. 4.1.1 The Fire Service Instructor I shall meet the JPRs defined in Sections 4.2 through 4.5 of this standard.	Yes ☐ No ☐
4.2 Program Management. 4.2.1 Definition of Duty. The management of basic resources and the records and reports essential to the instructional process.	
4.2.2 Assemble course materials, given a specific topic, so that the lesson plan and all materials, resources, and equipment needed to deliver the lesson are obtained. (A) Requisite Knowledge. Components of a lesson plan, policies and procedures for the procurement of materials and equipment, and resource availability. (B) Requisite Skills. None required.	Yes ☐ No ☐
4.2.3 Prepare requests for resources, given training goals and current resources, so that the resources required to meet training goals are identified and documented. (A) Requisite Knowledge. Resource management, sources of instructional resources and equipment. (B) Requisite Skills. Oral and written communication, forms completion.	Yes ☐ No ☐
4.2.4 Schedule single instructional sessions, given a training assignment, department scheduling procedures, instructional resources, facilities and timeline for delivery, so that the specified sessions are delivered according to department procedure. (A) Requisite Knowledge. Departmental scheduling procedures and resource management. (B) Requisite Skills. Training schedule completion.	Yes ☐ No ☐
4.2.5 Complete training records and report forms, given policies and procedures and forms, so that required reports are accurate and submitted in accordance with the procedures. (A) Requisite Knowledge. Types of records and reports required, and policies and procedures for processing records and reports. (B) Requisite Skills. Basic report writing and record completion.	Yes ☐ No ☐
4.3 Instructional Development. 4.3.1* Definition of Duty. The review and adaptation of prepared instructional materials.	
4.3.2* Review instructional materials, given the materials for a specific topic, target audience, and learning environment, so that elements of the lesson plan, learning environment, and resources that need adaptation are identified. (A) Requisite Knowledge. Recognition of student limitations and cultural diversity, methods of instruction, types of resource materials, organization of the learning environment, and policies and procedures. (B) Requisite Skills. Analysis of resources, facilities, and materials.	Yes ☐ No ☐
4.3.3* Adapt a prepared lesson plan, given course materials and an assignment, so that the needs of the student and the objectives of the lesson plan are achieved. (A)* Requisite Knowledge. Elements of a lesson plan, selection of instructional aids and methods, and organization of the learning environment. (B) Requisite Skills. Instructor preparation and organizational skills.	Yes ☐ No ☐
4.4 Instructional Delivery. 4.4.1 Definition of Duty. The delivery of instructional sessions utilizing prepared course materials.	

Company Fire Officer	Competency Met
4.4.2 Organize the classroom, laboratory, or outdoor learning environment, given a facility and an assignment, so that lighting, distractions, climate control or weather, noise control, seating, audiovisual equipment, teaching aids, and safety are considered. (A) Requisite Knowledge. Classroom management and safety, advantages and limitations of audiovisual equipment and teaching aids, classroom arrangement, and methods and techniques of instruction. (B) Requisite Skills. Use of instructional media and teaching aids	Yes ☐ No ☐
4.4.3 Present prepared lessons, given a prepared lesson plan that specifies the presentation method(s), so that the method (s) indicated in the plan are used and the stated objectives or learning outcomes are achieved, applicable safety standards and practices are followed, and risks are addressed. (A)* Requisite Knowledge. The laws and principles of learning, methods and techniques of instruction, lesson plan components and elements of the communication process, and lesson plan terminology and definitions; the impact of cultural differences on instructional delivery; safety rules, regulations, and practices; identification of training hazards; elements and limitations of distance learning; distance learning delivery methods; and the instructor's role in distance learning. (B) Requisite Skills. Oral communication techniques, methods and techniques of instruction, and utilization of lesson plans in an instructional setting.	Yes ☐ No ☐
4.4.4* Adjust presentation, given a lesson plan and changing circumstances in the class environment, so that class continuity and the objectives or learning outcomes are achieved. (A) Requisite Knowledge. Methods of dealing with changing circumstances. (B) Requisite Skills. None required.	Yes ☐ No ☐
4.4.5* Adjust to differences in learning styles, abilities, cultures, and behaviors, given the instructional environment, so that lesson objectives are accomplished, disruptive behavior is addressed, and a safe and positive learning environment is maintained. (A)* Requisite Knowledge. Motivation techniques, learning styles, types of learning disabilities and methods for dealing with them, and methods of dealing with disruptive and unsafe behavior. (B) Requisite Skills. Basic coaching and motivational techniques, correction of disruptive behaviors, and adaptation of lesson plans or materials to specific instructional situations.	Yes ☐ No ☐
4.4.6 Operate audiovisual equipment and demonstration devices, given a learning environment and equipment, so that the equipment functions properly. (A) Requisite Knowledge. Components of audiovisual equipment. (B) Requisite Skills. Use of audiovisual equipment, cleaning, and field level maintenance.	Yes ☐ No ☐
4.4.7 Utilize audiovisual materials, given prepared topical media and equipment, so that the intended objectives are clearly presented, transitions between media and other parts of the presentation are smooth, and media are returned to storage. (A) Requisite Knowledge. Media types, limitations, and selection criteria. (B) Requisite Skills. Transition techniques within and between media.	Yes ☐ No ☐
4.5 Evaluation and Testing. 4.5.1* Definition of Duty. The administration and grading of student evaluation instruments.	
4.5.2 Administer oral, written, and performance tests, given the lesson plan, evaluation instruments, and evaluation procedures of the agency, so that bias or discrimination is eliminated, the testing is conducted according to procedures, and the security of the materials is maintained. (A) Requisite Knowledge. Test administration, agency policies, laws and policies pertaining to discrimination during training and testing, methods for eliminating testing bias, laws affecting records and disclosure of training information, purposes of evaluation and testing, and performance skills evaluation. (B) Requisite Skills. Use of skills checklists and oral questioning techniques.	Yes ☐ No ☐
4.5.3 Grade student oral, written, or performance tests, given class answer sheets or skills checklists and appropriate answer keys, so the examinations are accurately graded and properly secured. (A) Requisite Knowledge. Grading methods, methods for eliminating bias during grading, and maintaining confidentiality of scores. (B) Requisite Skills. None required.	Yes ☐ No ☐

Company Fire Officer	Competency Met
4.5.4 Report test results, given a set of test answer sheets or skills checklists, a report form, and policies and procedures for reporting, so that the results are accurately recorded, the forms are forwarded according to procedure, and unusual circumstances are reported. (A) Requisite Knowledge. Reporting procedures and the interpretation of test results. (B) Requisite Skills. Communication skills and basic coaching.	Yes ☐ No ☐
4.5.5* Provide evaluation feedback to students, given evaluation data, so that the feedback is timely; specific enough for the student to make efforts to modify behavior; and objective, clear, and relevant; also include suggestions based on the data. (A) Requisite Knowledge. Reporting procedures and the interpretation of test results. (B) Requisite Skills. Communication skills and basic coaching.	Yes ☐ No ☐
Emergency Scene Management (4.6.1, 4.6.2)	
4.6.1 Develop an initial action plan, given size-up information for an incident and assigned emergency response resources, so that resources are deployed to control the emergency. (A)* Requisite Knowledge. Elements of a size-up, standard operating procedures for emergency operations, and fire behavior. (B)* Requisite Skills. The ability to analyze emergency scene conditions; to activate the local emergency plan, including localized evacuation procedures; to allocate resources; and to communicate orally.	Yes ☐ No ☐
4.6.2* Implement an action plan at an emergency operation, given assigned resources, type of incident, and a preliminary plan, so that resources are deployed to mitigate the situation. (A) Requisite Knowledge. Standard operating procedures, resources available for the mitigation of fire and other emergency incidents, an incident management system, scene safety, and a personnel accountability system. (B) Requisite Skills. The ability to implement an incident management system, to communicate orally, to manage scene safety, and to supervise and account for assigned personnel under emergency conditions.	Yes ☐ No ☐

Appendix 3: Structure Fire Staffing Analysis

NFPA 1710: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments

This edition of NFPA 1710 was approved as an American National Standard on May 18, 2019.

The following is excerpted from the NFPA 1710 standard with the running totals added for reference.

5.2.4.1 Single-Family Dwelling Initial Full Alarm Assignment Capability.

5.2.4.1.1* The initial full alarm assignment to a structure fire in a typical 2,000 ft² (186 m²), two-story single-family dwelling without basement and with no exposures shall provide for the following:

- (1) Establishment of incident command outside of the hazard area for the overall coordination and direction of the initial full alarm assignment with a minimum of one member dedicated to this task (1)

Running total: 1

- (2) Establishment of an uninterrupted water supply of a minimum of 400 gpm (1,520 L/min) for 30 minutes with supply line(s) maintained by an operator (1)

Running total: 2

- (3) Establishment of an effective water flow application rate of 300 gpm (1,140 L/min) from two handlines, each of which has a minimum flow rate of 100 gpm (380 L/min) with each handline operated by a minimum of two members to effectively and safely maintain the line (4)

Running total: 6

- (4) Provision of one support member for each attack and backup line deployed to provide hydrant hookup and to assist in laying of hose lines, utility control, and forcible entry (2)

Running total: 8

- (5) Provision of at least one victim search and rescue team with each such team consisting of a minimum of two members (2)

Running total: 10

- (6) Provision of at least one team, consisting of a minimum of two members, to raise ground ladders and perform ventilation (2)

Running total: 12

- (7) If an aerial device is used in operations, one member to function as an aerial operator to maintain primary control of the aerial device at all times (1)

Running total: 13

- (8) At a minimum, an initial rapid intervention crew (IRIC) assembled from the initial attack crew and, as the initial alarm response arrives, a full and sustained rapid intervention crew (RIC) established (4)

Running total: 17

- (9) Total effective response force with a minimum of 16 (17 if an aerial device is used)

5.2.4.2 Open-Air Strip Shopping Center Initial Full Alarm Assignment Capability.

5.2.4.2.1* The initial full alarm assignment to a structure fire in a typical open-air strip shopping center ranging from 13,000 ft² to 196,000 ft² (1,203 m² to 18,209 m²) in size shall provide for the following:

- (1) Establishment of incident command outside the hazard area for the overall coordination, direction, and safety of the initial full alarm assignment with a minimum of two members dedicated to managing this task (2)

Running Total: 2

- (2) Establishment of two uninterrupted water supplies at a minimum of 500 gpm (1,892 L/min), with each supply line maintained by an operator (2)

Running Total: 4

- (3) Establishment of an effective water flow application rate of 500 gpm (1,892 L/min) from three handlines, each of which has a minimum flow rate of 150 gpm (568 L/min), with each handline operated by a minimum of two members to effectively and safely maintain each hand-line (6)

Running Total: 10

- (4) Provision of one support member for each attack, backup, and exposure line deployed to provide hydrant hookup and to assist in laying of hose lines, utility control, and forcible entry (3)

Running Total: 13

- (5) Provision of at least two victim search-and-rescue teams, each team consisting of a minimum of two members (4)

Running Total: 17

- (6) Provision of at least two teams, each team consisting of a minimum of two members, to raise ground ladders and perform ventilation (4)

Running Total: 21

- (7) If an aerial device(s) is used in operations, one member to function as an aerial operator and maintain primary control of the aerial device at all times (1)

Running Total: 22

- (8) At a minimum, an initial rapid intervention crew (IRIC) assembled from the initial attack crew and, as the initial alarm response arrives, a full and sustained rapid intervention crew (RIC) established (4)

Running Total: 26

- (9) The establishment of an initial medical care component consisting of at least two members capable of providing immediate on-scene emergency medical support and transport that provides rapid access to civilians or members potentially needing medical treatment (2)

Running Total: 28

- (10) Total effective response force a minimum of 27 (28 if an aerial device is used)

5.2.4.3 Apartment Initial Full Alarm Assignment Capability.

5.2.4.3.1 The initial full alarm assignment to a structure fire in a typical 1,200 ft² (111 m²) apartment within a three-story, garden-style apartment building shall provide for the following:

- (1) Establishment of incident command outside the hazard area for the overall coordination, direction, and safety of the initial full alarm assignment with a minimum of two members dedicated to managing this task (2)

Running Total: 2

- (2) Establishment of two uninterrupted water supplies at a minimum of 400 gpm (1,520 L/min), with each supply line maintained by an operator (2)

Running Total: 4

- (3) Establishment of an effective water flow application rate of 300 gpm (1,140 L/min) from three handlines, each of which has a minimum flow rate of 100 gpm (380 L/min), with each handline operated by a minimum of two members to effectively and safely maintain each hand- line (6)

Running Total: 10

- (4) Provision of one support member for each attack, backup, and exposure line deployed to provide hydrant hookup and to assist in laying of hose lines, utility control, and forcible entry (3)

Running Total: 13

- (5) Provision of at least two victim search-and-rescue teams, each team consisting of a minimum of two members (4)

Running Total: 17

- (6) Provision of at least two teams, each team consisting of a minimum of two members, to raise ground ladders and perform ventilation (4)

Running Total: 21

- (7) If an aerial device is used in operations, one member to function as an aerial operator and maintain primary control of the aerial device at all times (1)

Running Total: 22

- (8) At a minimum, an initial rapid intervention crew (IRIC) assembled from the initial attack crew and, as the initial alarm response arrives, a full and sustained rapid intervention crew (RIC) established (4).

Running Total: 26

- (9) The establishment of an initial medical care component consisting of at least two members capable of providing immediate on-scene emergency medical support, and transport that provides rapid access to civilians or members potentially needing medical treatment (2)

Running Total: 28

- (10) Total effective response force a minimum of 27 (28 if an aerial device is used)

5.2.4.4 * High-Rise Initial Full Alarm Assignment Capability.

5.2.4.4.1 Initial full alarm assignment to a fire in a building with the highest floor greater than 75 ft (23 m) above the lowest level of fire department vehicle access shall provide for the following:

- (1) Establishment of a stationary incident command post outside the hazard area for overall coordination and direction of the initial full alarm assignment with a minimum of one officer with an aide dedicated to these task- and all operations are to be conducted in compliance with the incident command system. (2)

Running Total: 2

- (2) Establishment of an uninterrupted water supply to the building standpipe/sprinkler connection sufficient to support fire attack operations maintained by an operator and if the building is equipped with a fire pump, one additional member with a radio to be sent to the fire pump location to monitor and maintain operation. (1/1)

Running Total: 3

- (3) Establishment of an effective water flow application rate on the fire floor at a minimum of 500 gpm (1,892 L/m) from two handlines, each operated by a minimum of two members to safely and effectively handle the line. (4)

Running Total: 7

- (4) Establishment of an effective water flow application rate on the floor above the fire floor at a minimum of 250 gpm (946 L/m) from at least one handline, with each deployed handline operated by a minimum of two members to safely and effectively handle the line. (2)

Running Total: 9

- (5) At a minimum, an initial rapid intervention crew (IRIC) assembled from the initial attack crew and, as the initial alarm response arrives, a full and sustained rapid intervention crew (RIC) established. (4)

Running Total: 13

- (6) Provision of two or more search-and-rescue teams consisting of a minimum of two members each. (4)

Running Total: 17

- (7) Provision of one officer, with an aide, dedicated to establishing an oversight at or near the entry point on the fire floor(s). (2)

Running Total: 19

- (8) Provision of one officer, with an aide, dedicated to establishing an oversight at or near the point of entry on the floor above the fire. (2)

Running Total: 21

- (9) Provision of two or more evacuation management teams to assist and direct building occupants with evacuation or sheltering actions, with each team consisting of a minimum of two members. (4)

Running Total: 25

- (10) Provision of one or more members to account for and manage elevator operations. (1)

Running Total: 26

- (11) Provision of a minimum of one trained incident safety officer. (1)

Running Total: 27

- (12) Provision of a minimum of one officer two floors below the fire floor to manage the interior staging area. (1)

Running Total: 28

- (13) Provision of a minimum of two members to manage member rehabilitation and at least one of the members to be trained to the ALS level. (2)

Running Total: 30

- (14) Provision of an officer and a minimum of three members to conduct vertical ventilation operations. (4)

Running Total: 34

- (15) Provision of a minimum of one officer to manage the building lobby operations. (1)

Running Total: 35

- (16) Provision of a minimum of two members to transport equipment to a location below the fire floor. (2)

Running Total: 37

- (17) Provision of one officer to manage external base operations. (1)

Running Total: 38

- (18) The establishment of an initial medical care component consisting of a minimum of two crews with a minimum of two members each with one member trained to the ALS level capable of providing immediate on-scene emergency medical support, and transport that provides rapid access to civilians or members potentially needing medical treatment. (4)

Running Total: 42

- (19) Total effective response force a minimum of 42 (43 if the building is equipped with a fire pump).

Appendix 4: Consultants' Backgrounds

Dave Mitchell

Dave Mitchell retired as Division Chief, Communications in 1998 from Vancouver Fire & Rescue Services following a career spanning 32 years. During this time, he was responsible for managing the emergency call taking and dispatch for the Vancouver and Whistler Fire Departments. In 1997 he managed the transition of dispatch service for the five fire departments on the Sunshine Coast from an independent contractor to Vancouver Fire & Rescue Services.

In 1998, Dave was hired by E-Comm 9-1-1, Emergency Communications for BC (E-Comm) as its first Director of Operations. In this role he was a member of the founding senior management team and was responsible for the transition of the Regional 9-1-1 Control Centre staff from the Vancouver Police Department to E-Comm in June 1999. By June 2000 this included the management of approximately 200 call takers, dispatchers and team managers in addition to a ULC listed alarm monitoring service.

He left E-Comm in June 2000 to work as a consultant, and since that time has managed the development of corporate, strategic and operational plans for a number of clients. As principal of DMA, Dave participates on all projects undertaken by the company either as the lead consultant or by providing his expertise at an advisory or support level.

Dave holds a Bachelor of Arts Degree (Geography) from Simon Fraser University in addition to a diploma from their Executive Management Development Program. He is past Chair of the Board of Directors of the Vancouver General Hospital and University of British Columbia Hospital Foundation, and currently a Director and Board Chair of the Justice Institute of British Columbia Foundation, a member of the National Fire Protection Association, the National Emergency Number Association, the Association of Public-Safety Communications Officials, the Fire Chiefs' Association of British Columbia, the BC 911 User Group, and the Canadian Association of Management Consultants.

Gordon Anderson

Gordon Anderson retired in 2019 with 29 years in the fire service, serving for the last five as the British Columbia Fire Commissioner. In this role, he was the senior fire authority for the Province providing advice to government and supporting local government fire services, as well as dealing with fire service issues at the national level.

During this time he implemented a new Structure Firefighter Training Standard (the Playbook), modernized and expanded the wildland interface Structure Protection Program in partnership with the BC Wildfire Service and the Fire Chiefs' Association of BC and, with extensive stakeholder input, successfully developed and passed new provincial legislation to repeal and replace the current Fire Services Act (implementation pending). He also periodically fulfilled the role of Acting Assistant Deputy Minister for Emergency Management BC (including during the record 2017 flood season).

Prior to joining the Office of the Fire Commissioner, he spent 13 years with volunteer fire departments, five years with the Victoria City Police and 22 years in Esquimalt Fire Rescue (a combination police/fire public safety department) where he rose through the ranks to finish his last six years as Deputy Fire Chief. He has extensive experience as a career department Chief Training Officer and 12 years as a contract instructor for the Justice Institute of BC's firefighter training program and all four levels of the Fire Officer Certificate Program.

Gord has a Bachelor of Arts degree from the University of Victoria and NFPA Fire Officer Level 4 certification; in 2018 he earned a Bachelor of Public Safety Administration degree. He also holds certification as an Executive Chief Fire Officer and is a Fellow at the Institution of Fire Engineers (United Kingdom). He is past-President of the Council of Canadian Fire Marshals and Fire Commissioners as well as having served on the governance board of the Canadian Public Safety Operations Organization. The opportunity to use all of this experience has led him to move into a consulting role for a wide range of fire service, public safety and emergency management issues. Most recently he worked with DMA on a core service review of Bowen Island Fire Rescue and the fire master plan currently underway for the New Westminster Fire Department.

Jim Cook

Jim Cook is an experienced professional with over 38 years of experience in the fire service. He has extensive knowledge and experience with budgets, labour relations, fire operations, strategic planning, executive leadership, project management, community engagement, and organizational change.

Jim began his career in the New Westminster Fire Department. He was promoted to the position of Deputy Chief in 2001. His roles and responsibilities included administration, annual operating and capital budgets, communications, human resources, emergency operations, training and facility maintenance including the planning and oversight of the transfer of personnel and equipment to the new main fire hall.

In 2008, Jim was appointed to the position of Fire Chief in West Vancouver where he worked to improve the mutual and automatic aid agreements in the region. This included transitioning the department to the E-Comm Wide Area Radio System. He also served as a member of the senior management committee responsible for leading the analysis, planning and design of an emergency services building.

During his career, Jim has worked on several committees and boards including the BC Municipal Pension Plan, BC Investment Management Corporation, Vancouver Hospital Foundation, BC Fire & Life Safety Education Program, First Responder Program and the BC Fire Chiefs Association. He is also a past-President of the Greater Vancouver Fire Chiefs Association.

Jim retired in 2015 and is now working as a consultant specializing in organizational structure and change management in the fire service. He recently participated on DMA's review of Nanaimo Fire Rescue's Fire Prevention Division, the governance review of the Nanaimo

Regional District's fire departments and a core service review of Bowen Island Fire Rescue. Currently he is working with DMA on a review of the Moberly Lake Fire Department for the Peace River Regional District.

Wayne Humphry

Wayne has over 40 years' experience with the BC fire service. He retired in 2009 from Vancouver Fire/Rescue after a career spanning 31 years. During this time, Wayne served in fire suppression, rising to the rank of Battalion Chief. He also worked extensively with Vancouver Fire's training division as an instructor and Division Chief between 1996 and 2009. Based on his work in both roles he has extensive experience in fire rescue emergency operations, specialty teams, logistical planning and budgeting, training and development, facilitation, and project creation and management. In addition to his work with Vancouver Fire he has been an instructor at the Justice Institute of BC, at UBC's Sauder School of Business as well as for Capilano University.

Wayne has developed and delivered in-house Firefighter and Fire Officer Development seminars, including ProBoard certified programs, for various career and volunteer/paid-on-call fire departments throughout BC, Alberta, Manitoba, the Yukon and Northwest Territories.⁸²

His training expertise includes Firefighter I & II, Fire Officer Level 1, 2 and 3 programs – Emergency Incident Management (BCEMS/ICS, Command Post and EOC operations, fire behavior, strategies and tactics); Incident Safety Officer; Rapid Intervention Teams; Fire Service Instructor; and Live Fire Exercises Levels 1, 2 & 3.

Wayne has worked with DMA since 2010 and has participated in many of the fire service projects. Most recently he worked on the fire service reviews for Prince George, the Regional District of Fraser-Fort George, the Regional District of Okanagan Similkameen, the Thompson Nicola Regional District, the Peace River Regional District, and the Sunshine Coast Regional District. Currently he is involved in the Moberly Lake project, establishment of a new fire service area for Pritchard and a fire master plan for the New Westminster Fire Department. In addition, Wayne continues to develop and deliver firefighter and fire officer development and emergency incident management to a wide range of clients.

⁸² Wayne has trained fire fighters and fire officers from a large number of fire departments in several provinces including: Adams Lake, Armstrong-Spallumcheen, Ashcroft, Barriere, Beaver Creek, Burnaby, Burns Lake, Calgary, Celista, Central Saanich, Chase, Comox, Coquitlam, Cowichan Bay, Cranbrook, Cumberland, Dawson Creek, Deep Bay, Delta, District of North Vancouver, Enderby, Errington, Esquimalt, Fernie, Fort St James, Fort St John, Golden, Kamloops, Kelowna, Langford, Langley City and Township, Logan Lake, Loon Lake, Lumby, Malakwa, Maple Ridge, Mission, Nanaimo, New Westminster, North Saanich, Oak Bay, Peachland, Pemberton, Port Alberni, Port Alice, Port Coquitlam, Port Moody, Prince George, Princeton, Quesnel, Salmo, Sayward, Smithers, Sooke, Squamish, Summerland, Terrace, Vernon, View Royal, West Vancouver, Whistler, Williams Lake, Windermere, Winnipeg, Yale, and Yellowknife.

Ian MacDonald

Ian MacDonald is a former lawyer who practiced international corporate law in Canada and the United Kingdom. Ian started as a lawyer with Davies Ward & Beck in Toronto in 1990 and worked on large corporate transactions in Canada, including corporate financings, shareholder agreements and corporate restructurings and corporate acquisitions. Ian became a partner in Davies Ward & Beck in 1994 and an equity partner in 1996.

After moving to England in 1998, Ian became managing partner of Arnander, Irvine & Zietman, an intellectual property/litigation firm, and had a varied practice advising clients in respect of company formation, shareholder and members' agreements, corporate financing, governance issues, and privacy matters. He also did extensive work on litigation files related to corporate fraud.

Ian retired as a lawyer in January 2004 and returned to Canada, since which time he has acted as a volunteer director on two boards, acting as the chair of the governance committee for both, and assisted various community groups in developing long term strategic and business plans. Ian has previously worked with Planetworks Consulting Corporation on the Capital Region Emergency Service Telecommunications project, conducting a full governance review of that organization.

Ian has worked with DMA since 2007, working on almost all the major fire and emergency service projects, including the fire service reviews for the Kootenay Boundary Regional Fire Service, 100 Mile House Fire Rescue Department, Whitehorse, Prince George and West Vancouver fire departments, the Armstrong-Spallumcheen Volunteer Fire Department and the Thompson Nicola and Okanagan Similkameen regional districts. He also participated on development of the strategic plan for the Sunshine Coast Regional District's four fire departments, the related review of the SCRD's Emergency Management Program, as well as the updating of the Saanich master fire plan.

Most recently he was part of DMA's review of Nanaimo Fire Rescue's Fire Prevention Division, the governance review of the Nanaimo Regional District's fire departments and the core service review for the Bowen Island Fire Department. In addition, he is providing advice to several fire departments as they rewrite their bylaws to reflect the changes required by the Playbook and the Fire Safety Act. He is currently working on the master plan for the New Westminster Fire Department and on a fire service expansion review for the Pritchard Volunteer Fire Department in the Thompson-Nicola Regional District.

Patrick McPhillips

Patrick McPhillips retired in 2012 after a 35-year career with Coquitlam Fire/Rescue where he served as professional fire fighter, Chief Training Officer and Assistant Chief of Operations. In these roles Patrick was involved with all aspects of fire service training, safety and crew management, fire investigations, fire inspections and emergency operations. Since 2009, Patrick has been a Structure Protection Specialist for the Office of the Fire Commissioner (the OFC). As part of a wildfire management team his duties include working as part of an Incident

Command team; coordinating the management and deployment of structure protection trailers and crews; and the triaging and protecting of structures in the wildland interface. As well, in 2012 he temporarily served as Fire Services Advisor (Coastal Region) for the OFC where he assisted the public in fire code inquiries, conducted fire inspections and fire investigations and delivered training. Patrick is experienced and qualified at delivering a variety of forestry wildfire courses. Recently, Patrick established the consulting firm, Pacific Wildfire Consulting, to provide advice to communities and industry on forestry interface protection issues. Patrick has been associated with DMA since 2015. He helped develop Standard Operating Guidelines for the Pender Harbour Volunteer Fire Department, participated on an asset deployment project for the Saanich Fire department and on fire service projects for the Peace River Regional District.

Peter Wunder

Peter Wunder is a B.C. registered Professional Engineer with over 35 years' experience in the design, development, implementation, commissioning, operation and maintenance of complex mechanical, electrical, and control systems. He has extensive experience in alternate energy solutions in the automotive and transportation industry including integration of hydrogen fuel cells and diesel to natural gas conversions. He has managed many challenging programs and has worked closely with regulatory bodies to ensure the successful certification and commercial introduction of products using these new technologies.

Additionally, he is an experienced marine systems engineer and served on ships in the Royal Canadian Navy as Head of the Marine Systems Engineering Department, responsible for the safe operation and maintenance of all marine systems on board. In this capacity he was also Head of the shipboard Damage Control and Firefighting organization with experience in the operation and maintenance of fire suppression equipment and systems including Dry Chemical (Purple-K), Aqueous Film Forming Foam (AFFF), CO2 Flood, High Velocity Nozzles and Low Velocity Fog Applicators, and Galley Fire Suppression Systems (Range Guard). He also has direct experience in training fighting personnel onboard ship in many emergency scenarios including helicopter crashes.