

**Agenda for the 3:30 pm Wednesday, February 26, 2020, Town of Qualicum Beach
Regular Council Meeting to be held in the Council Chamber, Municipal Office,
660 Primrose Street, Qualicum Beach, BC**

Page No.

(This meeting may be recorded)

1. ADOPTION OF THE AGENDA

1-6 THAT Council adopts the February 26, 2020, regular Council meeting agenda.

2. APPROVAL OF THE MINUTES

7-22 THAT Council approves the following Council meeting minutes:

- January 30, 2020 special Council meeting;
- February 5, 2020 regular Council meeting;
- February 10, 2020 special Council meeting.

3. BUSINESS ARISING FROM THE MINUTES

(1) Recommendations from the February 13, 2020 Committee of the Whole Meeting

Motions (a) to (i) will be discussed under "Bylaws" item 9(1)

(a) THAT the Committee of the Whole recommends to Council THAT Council directs staff to provide a report on increasing budget on Public Works and Parks; AND FURTHER THAT the report includes options on increasing personnel or staffing levels.

(b) THAT the Committee of the Whole recommends to Council THAT the following notice of motion from the January 14, 2019 be referred to the Committee of the Whole meeting in which asset management will be discussed:

THAT Council directs staff to prepare and present a report on the state of the sidewalks within the Village Neighbourhood, including but not limited to:

- a. Recent remedial work completed,
- b. Anticipated remedial work for 2019,
- c. A proposal for actions and estimated costs, which would reduce current and future tripping hazards,
- d. A proposal for actions, and estimated costs, which would reduce the ongoing maintenance,
- e. A capital asset management plan for this infrastructure,
- f. An estimated cost of undergrounding the utilities on Fern Road West between Memorial Avenue (Highway 4) and Primrose Street, and
- g. The anticipated cost of undergrounding the utilities on Primrose Street between Second Avenue West and Primrose Lane

- (c) THAT the Committee of the Whole recommends to Council THAT any further commitment to the 10-year financial plan be deferred, AND FURTHER THAT the 10-year financial plan be referred to the Committee of the Whole meeting in which asset management will be discussed.
- (d) THAT the Committee of the Whole recommends to Council THAT there be an additional one time 1% taxation increase for accommodating the cost of a feasibility report for the Perfect Storm Group.
- (e) THAT the Committee of the Whole recommends to Council THAT the following notice of motion from the January 14, 2019 regular Council meeting be deferred to a future Committee of the Whole meeting:
 - THAT Council directs staff to prepare and present a report regarding the estimated cost of replacing all of the street lights in Town with LED lighting and the anticipated savings once the lighting has been upgraded.
- (f) THAT the Committee of the Whole recommends to Council THAT the following notice of motion from the January 14, 2019 regular Council meeting be referred to staff (when time permits):
 - THAT Council directs staff to prepare a report regarding the costs associated with one, or multiple, municipal glass recycling drop off locations, AND FURTHER THAT Council directs staff to prepare potential uses for the collected materials.
- (g) THAT the Committee of the Whole recommends to Council THAT the following notice of motion from the January 14, 2019 regular Council meeting be referred to a future Committee of the Whole meeting for discussion:
 - THAT Council directs staff to prepare a report regarding the costs, schedules, staff time, and equipment usage, for the current town run chipping program; AND FURTHER THAT, Council directs staff to provide recommendations regarding:
 - a. Fixed year-round drop-off locations;
 - b. Automated green material pickup;
 - c. Scheduled green material bin drop off; and
 - d. Variable pickup schedules via online requests.

- (h) THAT the Committee of the Whole recommends to Council THAT the following notice of motion from the January 14, 2019 regular Council meeting be withdrawn:
THAT Council directs staff to provide a report regarding any policies, bylaws, plans recent or upcoming activity relating to the larger signage around the community.

- (i) THAT the Committee of the Whole recommends to Council THAT the bylaw entitled "Town of Qualicum beach Financial Plan (2020-2024) Bylaw No. 738, 2019" be given third reading.

Consideration of third reading listed under "Bylaws" section of agenda.

- (j) THAT the Committee of the Whole recommends to Council THAT the following notice of motion from the January 14, 2019 regular Council meeting be withdrawn:
THAT Council directs staff to provide a Child Care Report at all future Regular Council meetings to include, among other items, progress on the Union of British Columbia Municipalities (UBCM) Community Child Care Planning Program, and the British Columbia (BC) New Spaces Fund, until otherwise directed by Council.

4. PUBLIC AND STATUTORY HEARINGS

- 23-46 (1) **Zoning Amendment: 191 Fourth Avenue West** - zoning amendment to permit a duplex on the subject property
- 47-73 (2) **Zoning Amendment: 595 Spruce Street** - zoning amendment to permit two single-family dwellings on the subject property
- 74-83 (3) **Zoning Amendment: Village Way and Railway Street Affordable Housing Development** - zoning amendment to permit a medium-density affordable housing development on the Town-owned lands located at Railway Street and Village Way

5. DELEGATIONS

- (1) **Ceri Peacey, Brant Wildlife Festival** - Update on the 2020 Brant Wildlife Festival; requesting support to assist with promotion of the Festival
Staff Recommendation:
THAT Council direct staff to provide funding in the amount of \$2,500 to the Brant Wildlife Festival to assist with promotion of the festival.
- (2) **Danielle Paydli, Fresh Water Alliance** - water protection on the Island and CodeBlue BC

6. CORRESPONDENCE

- 84-85 (1) **Correspondence Log** – February 26, 2020 – For Information

7. COMMITTEE & LIAISON REPORTS

- (1) **General Government** (Mayor Brian Wiese)
- (2) **Parks & Recreation** (Councillor Robert Filmer)
- (3) **Community Development** (Councillor Scott Harrison)
- (4) **Arts & Culture** (Councillor Adam Walker)
- (5) **Protective Services** (Councillor Teunis Westbroek)

8. STAFF REPORTS

- (1) **Corporate Administrator** (Heather Svensen)
 - (a) **Announcement of Council Meeting Motions
February 10, 2020 Special Council Meeting**

The following motions were released from the February 10, 2020 closed meeting of Council:

THAT Council appoints Tom Whitfield representing the Brown Property Preservation Society, to the Heritage Forest Commission, for a term ending December 31, 2021;

AND FURTHER THAT Council re-appoints to the Select Committee on Public Safety the following members: Carol Dowe, representing the Qualicum Woods Residents' Association; Ken Sherburne, representing the Oceanside Community Safety Volunteers; Bill Duckenfield, representing the Chartwell Residents Association, Liz Rotinsky as the alternate to the Chartwell Residents Association, Len Hooper, representing the D. 69 Emergency Communication Group;

AND FURTHER THAT, Barry Bleay be appointed as the new member representing Eaglecrest Residents' Association for a two-year term ending December 31, 2021;

AND FURTHER THAT Council adopt the amended Terms of Reference by reducing the Committee composition from 14 members to 11 members.

THAT Council directs staff to notify Qualicum-Parksville Kiwanis Housing Society that they are the successful proponent for the Railway Street Affordable Housing project.

THAT all the other proponents for the Railway Street Affordable Housing project be sent a letter of appreciation for their submission

- 86-90 (2) **Financial Administration** (John Marsh)
- (a) **Monthly Finance Report** – January 2020 - For Information
- 91-245 (b) **New Hazard, Risk and Vulnerability Analysis (HRVA)**
 Staff Recommendation:
 THAT the report from the Emergency Program Coordinator
 entitled "New Hazard, Risk Vulnerability Analysis (HRVA)" be
 received for information.
- 246-247 (3) **Fire Department** (Marc Norris, Fire Chief)
- (a) **Monthly Fire Department Report** – January 2020 - For Information
- (4) **Planning** (Luke Sales, Director of Planning)
- 248 (a) **Monthly Building Permit Report** – January 2020 - For Information
- 249 (b) **Monthly Bylaw Report** – January 2020 - For Information
- 250-257 (c) **Development Variance Permit: 333 Judges Row**
 Staff Recommendation:
 THAT Council directs staff to fulfill statutory notification
 requirements so that Council can consider issuance of a
 Development Variance Permit for 333 Judges Row at the Council
 Meeting on March 11, 2020.
- 258-264 (d) **Development Variance Permit and Development Permit:**
 217 Higson Crescent
 Staff Recommendation:
 THAT Council directs staff to fulfill statutory notification
 requirements so that Council can consider issuance of a
 Development Permit and a Development Variance Permit for
 217 Higson Crescent at the Council Meeting on March 11, 2020.
- 265-284 (5) **Engineering & Operations** (Bob Weir, P.Eng., Director)
- (a) **Age Friendly Transportation Plan - 2019 Update**
 Staff Recommendation:
 1. THAT the Age-Friendly Transportation Plan be accepted as
 presented in the February 26, 2020 regular Council agenda.
 2. THAT the Age-Friendly Transportation Plan be forwarded to the
 Public Safety Committee for their review and comment.

9. BYLAWS

- 285-295 (1) **Town of Qualicum Beach Financial Plan (2020-2024) Bylaw No. 738, 2019 Staff Recommendation:**

THAT the bylaw entitled "Town of Qualicum Beach Financial Plan (2020-2024) Bylaw No. 738, 2019" be given third reading.

10. COMMENTS FROM THE GALLERY *(Maximum 2 minutes each for comments only (no questions or dialogue), regarding business discussed by Council at this meeting except public hearing topics)*

11. ADJOURNMENT

THAT Council adjourns the meeting

NEXT SCHEDULED

REGULAR COUNCIL MEETING: March 11, 2020 at 3:30 pm

Minutes of the 8:30 am Thursday, January 30, 2020, Town of Qualicum Beach Special Council Meeting held in the Committee Room, Municipal Office, 660 Primrose Street, Qualicum Beach, BC

PRESENT: Council: Mayor Brian Wiese
Councillor Robert Filmer
Councillor Scott Harrison
Councillor Adam Walker
Councillor Teunis Westbroek

ALSO PRESENT: Staff: Dennis Trudeau, Acting Chief Administrative Officer
Luke Sales, Director of Planning
Haylee Gould, Deputy Corporate Administrator

The Mayor called the meeting to order at 8:30 am.

MOTION TO CLOSE

Councillor Harrison MOVED and Councillor Walker SECONDED, THAT the meeting be closed to the public for the purposes of considering:

- a. the acquisition, disposition or expropriation of land or improvements, if the council considers that disclosure could reasonably be expected to harm the interests of the municipality.

CARRIED

ADJOURNMENT

Councillor Filmer MOVED and Councillor Harrison SECONDED, THAT Council adjourns the meeting.

CARRIED

MEETING ADJOURNED: 9:30 am

Certified Correct:

Haylee Gould
Deputy Corporate Administrator

Brian Wiese
Mayor

Minutes of the 3:30 pm Wednesday, February 5, 2020, Town of Qualicum Beach Regular Council Meeting held in the Council Chamber, Municipal Office, 660 Primrose Street, Qualicum Beach, BC

PRESENT: Council: Mayor Brian Wiese
Councillor Robert Filmer
Councillor Scott Harrison
Councillor Adam Walker
Councillor Teunis Westbroek

ALSO PRESENT: Staff: Dennis Trudeau, Acting CAO
John Marsh, Financial Administrator
Luke Sales, Director of Planning
Heather Svensen, Corporate Administrator
Haylee Gould, Deputy Corporate Administrator
Genelle Conn, Manager of Finance

The Mayor called the meeting to order at 3:30 pm.

ADOPTION OF THE AGENDA

Council adopted, by unanimous consent, the February 5, 2020 Regular Council meeting agenda, with the addition of two late items:

- Item 8(5)(f), Memorial Avenue Roundabout - BC Active Transportation Infrastructure Grant;
- Item 7(4)(d), Childcare BC New Spaces Fund.

CARRIED

APPROVAL OF THE MINUTES

Council approved, by unanimous consent, the following meeting minutes:

- January 15, 2020 special Council;
- January 15, 2020 regular Council;
- January 16, 2020 special Council.

CARRIED

PUBLIC INPUT

(1) Development Variance Permit: 363 Judges Row

The Mayor invited the public to make representations to Council respecting the proposed Development Variance Permit for 363 Judges Row, which would reduce the front lot line setback by 4.34m and the setback from the natural boundary by 7.0m to permit a storage building for beach equipment with a covered area. No members of the public spoke on the proposed Development Variance Permit; Council reviewed a written submission.

(2) **Development Variance Permit: 530 Crescent Road West**

The Mayor invited the public to make representations to Council respecting the proposed Development Variance Permit for 530 Crescent Road West, which would reduce the rear lot line setback by 0.6m to permit an addition to the existing house. The proponent was the only member of the public who chose to speak on the proposed Development Variance Permit.

BUSINESS ARISING FROM THE MINUTES

(1) **Motions from the January 22, 2020 Committee of the Whole Meeting**

(Motions 1 through 5 will be dealt with under item 8(5)(a))

1. THAT the Committee of the Whole recommends to Council THAT Council directs staff to remove the cottages from St. Andrews, repurposing the structures if possible; AND FURTHER THAT consideration be given to utilize one building for future washroom use prior to removal of all cottages from St. Andrews.
2. THAT the Committee of the Whole recommends to Council THAT Council adopt the Former St. Andrews Waterfront Park Draft Concept Plan.
3. THAT the Committee of the Whole recommends to Council THAT the Town commission a feasibility study be done on the St. Andrews Lodge Building, as recommended in the draft Former St. Andrews Waterfront Park Draft Concept Plan.
4. THAT the Committee of the Whole recommends to Council THAT the Town commission an arborist report on the Former St. Andrews Waterfront Park, which includes a replanting plan, as recommended in the draft Former St. Andrews Waterfront Park Draft Concept Plan.
5. THAT the Committee of the Whole recommends to Council THAT Council directs Staff to designate the Former St. Andrews Waterfront Park as "Elizabeth Little Waterfront Park", and FURTHER THAT, the Town solicits public feedback on this name until March 30, 2020, as recommended in the draft Former St. Andrews Waterfront Park Draft Concept Plan.
6. Councillor Walker MOVED and Councillor Filmer SECONDED, THAT, due to the addition of the 'TimberFest' event for 2020, staff be directed to cease looking at options for a new annual street festival for the Summer of 2020.

CARRIED

7. Councillor Walker MOVED and Councillor Filmer SECONDED, THAT staff be instructed to arrange a Committee of the Whole meeting in the Fall/Winter of 2020 to evaluate and review all 2020 events to see where improvements, changes, etc. can be made.

CARRIED

8. Councillor Walker MOVED and Councillor Filmer SECONDED, THAT the Town consult with the West Ridge neighbourhood and others about the future of Lot 23 and landscaping on the adjacent Park berm, prior to proceeding with any land sales.

CARRIED

DELEGATIONS

- (1) **Joanne Sales of Broombusters Invasive Plant Society** appeared before Council to provide an update on the society's activities in 2019 and present the plan for Scotch Broom removal in 2020. Ms. Sales requested Council's support in approaching BC Hydro to clear broom from beneath the power transmission lines.

CORRESPONDENCE

- (1) **Correspondence Log** - February 5, 2020 - For Information
- (2) **Qualicum Beach Cinema Society** - January 20, 2020 - regarding the proposed sale of the 'Bus Garage' lands. The Mayor committed to sending a letter to the Qualicum Beach Cinema Society to thank them for their work, and to let them know about the upcoming Vancouver Island University planning sessions for the future development of the lands at Memorial Avenue and Fern Road.
- (3) **Douglas MacKay-Dunn** - January 23, 2020 - regarding feedback on the Qualicum Beach Residents' Association's newsletter. Council discussed protocols on Council members interacting with the public individually.
- (4) **Notice of Disposition to Naked Naturals Whole Foods** - example response to correspondence, additional information, and frequently asked questions. Council discussed Town protocol for sending responses on behalf of Council.

COMMITTEE & LIAISON REPORTS

- (1) **General Government** (Mayor Brian Wiese)
Mayor Wiese noted that he will be providing an update on a recent Closed meeting of Council at an upcoming regular meeting, after Council has reviewed his report.
- (2) **Parks & Recreation** (Councillor Robert Filmer)
Councillor Filmer noted that he will be attending a number of committee meetings in the coming weeks. Councillor Filmer questioned staff as to why the public walk through for the new school route trail was not completed prior to the trees being removed. Dennis Trudeau, Acting CAO, commented that there was a miscommunication on timing between staff and the contractor removing the trees which, was exacerbated by the snowfall that led to staff being unable to schedule the walk before clearing began. It was noted that the contractor is under tight timelines with a project completion date of March 31, 2020.

(3) **Community Development** (Councillor Scott Harrison)

Notice of Motion:

Councillor Harrison MOVED and Councillor Westbrook SECONDED, WHEREAS the strike between Western Forest Products and the United Steelworkers Union is currently in its eight month,

WHEREAS there are negative impacts on small businesses in the communities that are dependent upon the forestry sector that will not receive any form of assistance under the currently proposed relief measures, and further that significant negative impacts take place in communities that suffer an economic downturn;

BE IT RESOLVED, THAT the mayor write a letter to the minister of Forests, Land, Natural Resource Operations, and Rural Development, the Minister of Labour, the deputy ministers of said ministries, and the premier, asking the following questions:

- a. Given that mediation has not resolved the dispute, is there a specific reason that a fact finder has not been appointed by the government?
- b. Is there a specific reason that the Minister of Labour has not appointed an industrial inquiry committee?
- c. What are the specific terms contained within the last offer to the union that prevents the Minister of Labour from requesting a vote on said offer?
- d. Can the mediator prepare a report with a list of recommendations to help both parties conclude a successful negotiation?
- e. Is the government currently tracking the number of bankruptcies, foreclosures, variances in the rates of women and children fleeing violence, or variances in the rate of incidents of self-harm being tracked by the provincial government in the affected communities?

Council discussed the role of local government in relation to the ongoing labour dispute between the United Steelworkers Union and Western Forest Products.

A recorded vote was requested.

Mayor Wiese called the question on the motion and it was **CARRIED**.

In Favour: Mayor Wiese, Councillor Harrison, Councillor Westbrook

Opposed: Councillor Filmer, Councillor Walker.

Notice of Motion:

Councillor Harrison MOVED and Councillor Westbrook SECONDED, THAT the mayor write a letter to the appropriate contacts within the provincial government, UBCM, AVICC and other regional municipal associations asking if there will be a new set of applications to the Rural Dividend Fund in 2020 for small communities and First Nations, or if the delay in 2019 is actually a cut in funding for economic development in 2020 for both communities with a population under 25,000 and for First Nation communities.

Councillor Walker MOVED and Councillor Filmer SECONDED, THAT the motion be amended by striking "or if the delay in 2019 is actually a cut in funding for economic development in 2020 for both communities with a population under 25,000 and for First Nation communities."

CARRIED

MAIN MOTION AS AMENDED:

THAT the mayor write a letter to the appropriate contacts within the provincial government, UBCM, AVICC and other regional municipal associations asking if there will be a new set of applications to the Rural Dividend Fund in 2020 for small communities and First Nations.

CARRIED

Councillor Harrison provided a report which was included in the February 5, 2020 Council meeting agenda package.

(4) Arts & Culture (Councillor Adam Walker)

Councillor Westbroek MOVED and Councillor Harrison SECONDED, THAT discussion regarding recording votes at all in camera meetings be deferred to further discussion on the Council Procedure Bylaw.

CARRIED

Councillor Walker MOVED, THAT Council direct staff to provide a verbal update on the progress of the staff review related to the December 16, 2019 motion:

"THAT Council direct staff to draft a Town-Owned Land Sale Policy to be used by Council to ensure that the disposal of Town-owned lands is transparent and represents the best return on investment for the community".

Councillor Walker withdrew the motion.

Councillor Walker MOVED and Councillor Filmer SECONDED, THAT Council refer to the Select Committee on Environment and Sustainability a request to provide recommendations on tree planting to offset vegetation removed during the recent school route linkages trail construction.

CARRIED

Councillor Walker MOVED and Councillor Filmer SECONDED, THAT Council commits to funding costs borne in excess of those covered by the UBCM Community Child Care Space and BC Ministry of Children and Family Development - Childcare BC New Spaces Fund grant funding streams.

CARRIED

(5) **Protective Services** (Councillor Teunis Westbroek)

Councillor Westbroek commented on the following:

- Expecting a presentation on the Age Friendly Transportation Plan at the next regular Council meeting.
- At a transit committee meeting in Nanaimo, supporting students who asked to be considered as stakeholders when discussing fees.
- A comprehensive report will be submitted for inclusion in the next agenda.

STAFF REPORTS

(1) **Chief Administrative Officer** (Dennis Trudeau, Acting CAO)

(a) **2020 UBCM Community Emergency Preparedness Fund Emergency Social Services Grant Application**

Councillor Westbroek MOVED and Councillor Harrison SECONDED, THAT the report from the Manager of Information Technology entitled "2020 UBCM Community Emergency Preparedness Fund Emergency Social Services Grant Application" be received.

CARRIED

Councillor Westbroek MOVED and Councillor Harrison SECONDED, THAT Council approve the City of Parksville to be the primary applicant and apply for funding from the UBCM Community Emergency Preparedness Fund for a regional stockpile of group lodging supplies on behalf of both the City of Parksville and Town of Qualicum Beach.

CARRIED

Councillor Westbroek MOVED and Councillor Harrison SECONDED, THAT, if successful, Council approve the City of Parksville to receive and manage the grant funding on Town's behalf.

CARRIED

(b) **Regional Emergency Resource Agreement Renewal**

Councillor Harrison MOVED and Councillor Westbroek SECONDED, THAT the report from the Manager of Information Technology entitled "Regional Emergency Resource Agreement Renewal" be received.

THAT the Town of Qualicum Beach authorize the renewal of the Regional Emergency Resource Agreement for a one-year term to, and including, December 31, 2020.

CARRIED

(2) **Corporate Administrator (Heather Svensen)**

(a) **Announcement of Council Meeting Motions from the January 15, 2020 Special Council Meeting**

The following resolutions of Council were released from the January 15, 2020 special meeting:

THAT Council appoints John Howarth to the Airport Users Committee for a two-year term ending December 31, 2021.

THAT Council appoints Cormack Gates to the Heritage Forest Commission, as a member at large, for a term ending December 31, 2021.

THAT Council re-appoints Brian Dodds; Doug Hopewood; John Phillips and Greg Rowe to the Environment and Sustainability Committee for a two-year term ending December 31, 2021.

THAT Council appoints Ross Gilley to the Select Committee on Beach Day Celebration for a three-year term ending October 1, 2022.

THAT the Committee Terms of Reference be amended by reducing the Committee composition from nine members to eight members.

THAT Council re-appoints Peter Drummond; Rob Ferguson; Dan Mahony; and Margaret Rothe to the Select Committee on Parks and Recreation for a two-year term ending December 31, 2021.

THAT Council appoints Ray Woroniak to the Environment and Sustainability Committee for a two-year term ending December 31, 2021; and Elena Sales as the youth member at large for a two-year term ending December 31, 2021.

(b) **Investors Group Walk for Alzheimer's 2020**

Councillor Harrison MOVED and Councillor Filmer SECONDED, THAT Council grants permission to the Alzheimer Society of BC to hold their 'Investors Group Wealth Management Walk for Alzheimer's' event along the Dollymount Trail on Sunday, May 3, 2020, from 9:00 am to 3:00 pm, subject to the applicant working with staff to finalize arrangements;

AND FURTHER THAT Council authorizes in kind support for the Walk for Alzheimer's event through Town provision of garbage, recycling and compost cans, bags, and collection.

CARRIED

(3) **Financial Administration (John Marsh)**

(a) **Monthly Finance Report** - November 2019 - For Information

Councillor Westbrook MOVED and Councillor Filmer SECONDED, THAT the monthly finance report be received for information.

CARRIED

Councillor Harrison requested that airport expenses and revenues be included in greater detail in future finance reports.

Councillor Westbrook asked for clarification on the status of the Rodway Trail. Staff noted that there have been expenditures for storm drainage, and that the budget includes completion of the trail.

(b) **Beautification Report** - For Information

Councillor Filmer MOVED and Councillor Walker SECONDED, THAT Council refer discussion on Town beautification to the February 13, 2020 Committee of the Whole meeting to review options for increased staffing and/or contracting out, in consultation with the Town's Superintendent of Parks and Facilities and the Superintendent of Public Works.

CARRIED

(c) **Asset Management Strategy** - For Information

Councillor Walker MOVED and Councillor Harrison SECONDED, THAT the Town of Qualicum Beach Asset Management Strategy document dated February 5, 2020 be received by Council as amended.

CARRIED

Councillor Walker MOVED and Councillor Westbrook SECONDED, THAT staff be instructed to provide an update on Asset Management including, but not limited to, policy and strategy at a future Committee of the Whole meeting in 2020.

CARRIED

(4) **Fire Department (Marc Norris, Fire Chief)**

(a) **Fire Department Monthly Report** - December 2019 - For Information

Councillor Westbrook MOVED and Councillor Harrison SECONDED, THAT the December 2019 monthly fire department report be received for information.

CARRIED

(5) **Planning (Luke Sales, Director of Planning)**

(a) **Former St. Andrews Waterfront Park**

Councillor Westbrook MOVED and Councillor Walker SECONDED, THAT Council directs staff to remove all seven cabins from the St. Andrews property, AND FURTHER THAT, Council directs staff to award the contract to the lowest bidder, ANU Enterprises Ltd.

CARRIED

Council discussed options for building new or renovating a cabin for a public washroom.

Councillor Westbroek MOVED and Councillor Walker SECONDED, THAT Council adopt the Former St. Andrews Waterfront Park Draft Concept Plan.

Councillor Walker MOVED and Councillor Filmer SECONDED, THAT the motion be amended to include the following motions:

THAT Council directs staff to commission an arborist report on the Former St. Andrews Waterfront Park, which includes a replanting plan, as recommended in the draft Former St. Andrews Waterfront Park Draft Concept Plan.

THAT Council directs Staff to designate the Former St. Andrews Waterfront Park as "Elizabeth Little Waterfront Park", and FURTHER THAT, the Town solicits public feedback on this name until March 30, 2020, as recommended in the draft Former St. Andrews Waterfront Park Draft Concept Plan.

CARRIED

MAIN MOTION AS AMENDED:

THAT Council adopt the Former St. Andrews Waterfront Park Draft Concept Plan.

THAT Council directs staff to commission an arborist report on the Former St. Andrews Waterfront Park, which includes a replanting plan, as recommended in the draft Former St. Andrews Waterfront Park Draft Concept Plan.

THAT Council directs Staff to designate the Former St. Andrews Waterfront Park as "Elizabeth Little Waterfront Park", and FURTHER THAT, the Town solicits public feedback on this name until March 30, 2020, as recommended in the draft Former St. Andrews Waterfront Park Draft Concept Plan.

CARRIED

Councillor Walker MOVED and Councillor Harrison SECONDED, THAT Council directs staff to commission a feasibility study on the St. Andrews Lodge Building, as recommended in the draft Former St. Andrews Waterfront Park Draft Concept Plan.

Council discussed requesting a staff report prior to commissioning a feasibility study.

Mayor Wiese called the question on the motion and it was **CARRIED**.

(b) Development Variance Permit: 530 Crescent Road West

Councillor Walker and Councillor Westbroek SECONDED, THAT Council directs staff to issue a Development Variance Permit for 530 Crescent Road West as described in the February 5, 2020 Planning memo to Council.

CARRIED

(c) **Development Variance Permit: 703 Beach Road**

Councillor Westbroek MOVED and Councillor Walker SECONDED, THAT Council authorizes staff to issue a Development Permit for 703 Beach Road, as attached to the February 5, 2020 Planning memo to Council.

CARRIED

(d) **Development Variance Permit: 363 Judges Row**

Councillor Walker MOVED and Councillor Harrison SECONDED, THAT Council directs staff to issue a Development Variance Permit for 363 Judges Row, as described in the February 5, 2020 Planning memo to Council.

CARRIED

(e) **Regional Social Needs Assessment and Strategy - Grant Opportunity**

Councillor Westbroek MOVED and Councillor Walker SECONDED, THAT the Town of Qualicum Beach supports the Regional District of Nanaimo (RDN) as primary applicant to the UBCM Poverty Reduction Planning & Action grant program for a Social Needs Assessment and Strategy and authorizes the Regional District of Nanaimo to receive and manage the grant funding on its behalf.

CARRIED

(6) **Engineering & Operations (Bob Weir, P.Eng, Director of Engineering & Operations)**

(a) **LATE ITEM - Memorial Avenue Roundabout - BC Active Transportation Infrastructure Grant**

Councillor Harrison MOVED and Councillor Walker SECONDED, THAT Council of the Town of Qualicum Beach authorize the submission of a grant application to the Active Transportation Infrastructure Grant Program to help fund the Memorial Avenue/Highway 19A roundabout.

CARRIED

BYLAWS

(1) **Zoning Amendment: 595 Spruce Street**

Councillor Westbroek MOVED and Councillor Walker SECONDED, THAT prior to the bylaw entitled "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (595 Spruce Street) Bylaw No. 580.113, 2019" being adopted, that the developer makes a contribution to the Village Neighbourhood Sidewalk Reserve Account equivalent to the value of constructing a sidewalk for this property.

CARRIED

Councillor Westbroek MOVED and Councillor Walker SECONDED, THAT the bylaw entitled "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (595 Spruce Street) Bylaw No. 580.113, 2019" be given second reading.

CARRIED

Councillor Westbroek MOVED and Councillor Walker SECONDED, THAT Council hold a Public Hearing on February 26, 2020 at 3:30 pm at the Qualicum Beach Town Hall, 660 Primrose Street, Qualicum Beach in regard to "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (595 Spruce Street) Bylaw No. 580.113, 2019".

CARRIED

Councillor Walker MOVED and Councillor Filmer SECONDED, THAT staff be instructed to review options for registering a covenant to notify any future owners that the density of their property is lower than permitted in the Official Community Plan, and that the neighbourhood may develop at a higher density.

CARRIED

(2) **Zoning Amendment: 191 Fourth Avenue West**

Councillor Westbroek MOVED and Councillor Walker SECONDED, THAT the Town establishes a "Village Neighbourhood Sidewalk Reserve Account" to receive contributions for sidewalk improvements where it is not practical to construct a sidewalk at the time of development.

CARRIED

Councillor Westbroek MOVED and Councillor Walker SECONDED, THAT prior to the bylaw entitled "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (191 Fourth Avenue W) Bylaw No. 580.115, 2019" being adopted, that the developer makes a contribution to the Village Neighbourhood Sidewalk Reserve Account equivalent to the value of constructing a sidewalk for this property.

CARRIED

Councillor Westbroek MOVED and Councillor Walker SECONDED, THAT the bylaw entitled "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (191 Fourth Avenue W) Bylaw No. 580.115, 2019" be given second reading.

CARRIED

Councillor Westbroek MOVED and Councillor Walker SECONDED, THAT Council hold a Public Hearing on February 26, 2020 at 3:30 pm at the Qualicum Beach Town Hall, 660 Primrose Street, Qualicum Beach in regard to "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (191 Fourth Avenue W) Bylaw No. 580.115, 2019".

CARRIED

Councillor Walker MOVED and Councillor Filmer SECONDED, THAT staff be instructed to review options for registering a covenant to notify any future owners that the density of their property is lower than permitted in the Official Community Plan, and that the neighbourhood may develop at a higher density.

CARRIED

(3) **Zoning Amendment: 634 Rye Road**

Councillor Westbroek MOVED and Councillor Walker SECONDED, THAT the bylaw entitled "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (634 Rye Road) Bylaw No. 580.116, 2020" be introduced and given first reading.

CARRIED

Councillor Westbroek MOVED and Councillor Walker SECONDED, THAT Council refers the development application for 634 Rye Road to the Advisory Planning Commission for comment, subject to the following:

- a. Submission of a Tree and Vegetation Management Plan;
- b. Submission of a Landscape Plan; and,
- c. Submission of a Rainwater Management Plan.

CARRIED

Councillor Westbroek MOVED and Councillor Walker SECONDED, THAT prior to adoption of a zoning amendment bylaw for 634 Rye Road, the following be completed:

- a. Execution of a Works and Services Agreement to ensure completion of the adjacent works and services;
- b. Execution of a Section 219 Form and Character covenant to ensure that the development is constructed in conformance with the presentation to Council.

CARRIED

(4) **Railway Street and Village Way Affordable Housing Zoning Amendment**

Councillor Harrison MOVED and Councillor Walker SECONDED, THAT the bylaw entitled "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (Part of Village Way and Railway Street) Bylaw No. 580.117, 2020" be given second reading, as amended.

THAT Council schedule a Public Information Meeting on February 19, 2020 at 7:00 pm at the Qualicum Beach Civic Centre, 747 Jones Street, Qualicum Beach in regard to "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (Part of Village Way and Railway Street) Bylaw No. 580.117, 2020".

THAT Council hold a Public Hearing on February 26, 2020 at 3:30 pm at the Qualicum Beach Town Hall, 660 Primrose Street, Qualicum Beach in regard to "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (Part of Village Way and Railway Street) Bylaw No. 580.117, 2020".

Councillor Harrison MOVED and Councillor Westbroek SECONDED, THAT the motion be amended, prior to second reading of the bylaw, by amending the bylaw entitled "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (Part of Village Way and Railway Street) Bylaw No. 580.117, 2020" by consolidating the two parcels into one lot.

CARRIED

MAIN MOTION AS AMENDED

THAT the bylaw entitled "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (Part of Village Way and Railway Street) Bylaw No. 580.117, 2020" be amended by consolidating the two parcels into one lot.

THAT the bylaw entitled "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (Part of Village Way and Railway Street) Bylaw No. 580.117, 2020" be given second reading, as amended.

THAT Council schedule a Public Information Meeting on February 19, 2020 at 7:00 pm at the Qualicum Beach Civic Centre, 747 Jones Street, Qualicum Beach in regard to "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (Part of Village Way and Railway Street) Bylaw No. 580.117, 2020".

THAT Council hold a Public Hearing on February 26, 2020 at 3:30 pm at the Qualicum Beach Town Hall, 660 Primrose Street, Qualicum Beach in regard to "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (Part of Village Way and Railway Street) Bylaw No. 580.117, 2020".

A recorded vote was requested.

Mayor Wiese called the question on the motion and it was **CARRIED**.

In Favour: Mayor Wiese, Councillor Harrison, Councillor Westbroek

Opposed: Councillor Filmer, Councillor Walker

- (5) **Town of Qualicum Beach Financial Plan (2020-2024) Bylaw No. 738, 2019**
Councillor Filmer MOVED and Councillor Walker SECONDED, THAT the bylaw entitled "Town of Qualicum Beach Financial Plan (2020-2024) Bylaw No. 738, 2019" be given second reading.

CARRIED

Councillor Westbroek MOVED and Councillor Filmer SECONDED, THAT the bylaw entitled "Town of Qualicum Beach Financial Plan (2020-2024) Bylaw No. 738, 2019" be referred to the Committee of the Whole meeting on February 13, 2020 at 10:00 am.

CARRIED

COMMENTS FROM THE GALLERY

- Kevin Monahan, 586 Alder Street, commented on climate change, proposing that Council consider a policy so that Town decisions include an assessment on the impact of climate change. Mr. Monahan further commented on property covenants and how, in some instances, they may infringe on a property owner's freedom of speech.
- Douglas MacKay-Dunn, 2617 Island Highway, complimented the asset management plan, and extended an invitation to Council to attend a meeting of the Qualicum Beach Residents' Association on Thursday, March 17, 2020 to discuss climate change.

- Robert Taylor, owner of 634 Rye Road, commented that he inherited the property from his father, and noted that he wanted to build something to complement the town with a low impact on the environment.
- Steve Smith, 750 West Ridge Way, discussed the Town's land sale strategy, requesting that a consistent, transparent process be applied on disposition of the Town's land.
- Resident, 562 Willow Road, commented on the St. Andrews property, climate change, and carbon tax and how much the community benefits from the tax.
- Jennifer Spencer, 3180 Island Highway, expressed support for Mr. Monahan's comment about a climate change policy. Ms. Spencer further commented on the removal of trees and retention of the lodge at St. Andrews.

ADJOURNMENT

Councillor Filmer MOVED and Councillor Walker SECONDED, THAT Council adjourns the meeting.

CARRIED

MEETING ADJOURNED: 6:30 pm

Certified Correct:

Heather Svensen
Corporate Administrator

Brian Wiese
Mayor

Minutes of the 9:00 am Monday, February 10, 2020, Town of Qualicum Beach Special Council Meeting held in the Committee Room, Municipal Office, 660 Primrose Street, Qualicum Beach, BC

PRESENT: Council: Mayor Brian Wiese
Councillor Robert Filmer
Councillor Scott Harrison
Councillor Adam Walker
Councillor Teunis Westbroek

ALSO PRESENT: Staff: Luke Sales, Director of Planning
Dennis Trudeau, Director of Special Projects
Heather Svensen, Corporate Administrator

The Mayor called the meeting to order at 9:00 am.

ADOPTION OF THE AGENDA

Council adopted, by unanimous consent, the February 10, 2020 Special Council meeting agenda.

CARRIED

MOTION TO CLOSE

Councillor Filmer MOVED and Councillor Harrison SECONDED, THAT the meeting be closed to the public for the purposes of considering:

- a. personal information about an identifiable individual who holds or is being considered for a position as an officer, employee or agent of the municipality or another position appointed by the municipality; and
- b. the acquisition, disposition or expropriation of land or improvements, if the council considers that disclosure could reasonably be expected to harm the interests of the municipality.

CARRIED

MEETING CLOSED TO THE PUBLIC: 9:00 am

MEETING REOPENED TO THE PUBLIC: 10:09 am

ADJOURNMENT

Councillor Filmer MOVED and Councillor Walker SECONDED, THAT Council adjourns the meeting.

CARRIED

MEETING ADJOURNED: 10:09 am

Certified Correct:

Heather Svensen
Corporate Administrator

Brian Wiese
Mayor

Town of Qualicum Beach
MEMORANDUM

TO: Luke Sales, Director of Planning

FOR: Council, February 26, 2020

FROM: Rebecca Augustyn, Planner

SUBJECT: Zoning Amendment: 191 Fourth Avenue West

RECOMMENDATION

For information.

PURPOSE

To provide background information on the application for 191 Fourth Avenue West for the Public Hearing on February 26, 2020.

BACKGROUND

The owner of 191 Fourth Avenue West has made an application to amend the zoning for the subject property to permit a duplex. The subject property is currently zoned Residential 14 (R14) and is identified as Mixed Residential 2 in the Official Community Plan. The zoning amendment will change the zoning classification from 'Residential' 14 (R14) to 'Residential 19' (R19). The R19 zone permits single family dwellings and duplexes.

The application has received two readings, went before the Advisory Planning Commission on January 8, 2020, and the applicant hosted a Public Information Meeting on February 18, 2020. The Public Hearing is scheduled for February 26, 2020. On February 5, 2020, Council passed the following motions in relation to the application:

- THAT the Town establishes a "Village Neighbourhood Sidewalk Reserve Account" to receive contributions for sidewalk improvements where it is not practical to construct a sidewalk at the time of development.
- THAT prior to the bylaw entitled "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (191 Fourth Avenue W) Bylaw No. 580.115, 2019" being adopted, that the developer makes a contribution to the Village Neighbourhood Sidewalk Reserve Account equivalent to the value of constructing a sidewalk for this property.
- THAT the bylaw entitled "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (191 Fourth Avenue W) Bylaw No. 580.115, 2019" be given second reading.
- THAT Council hold a Public Hearing on February 26, 2020 at 3:30 pm at the Qualicum Beach Town Hall, 660 Primrose Street, Qualicum Beach in regard to "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (191 Fourth Avenue W) Bylaw No. 580.115, 2019".
- THAT staff be instructed to review options for registering a covenant to notify any future owners that the density of their property is lower than permitted in the Official Community Plan, and that the neighbourhood may develop at a higher density.

Staff have consulted with legal counsel, who advised:

- Registering a covenant to provide notice to future owners about development potential in the neighbourhood is not necessary from a legal perspective since future Councils always retain the right to amend the zoning.
- The Town should be cautious about putting notices on title as a set practice since doing so means the Town should do this for every zoning amendment in the future.
- The Land Titles Office in recent years has discouraged the use of Section 219 covenants as a notice to future owners so there would have to be some legitimate restriction of use.
- Although legally possible, it is not recommended that the Town put a notice on the property as a courtesy to future owners.

A Public Information Meeting was held by the applicant on February 18, 2020. At this meeting there was discussion regarding landscaping and laneway access to the property.



Figure 1: Subject Property

DISCUSSION

Following is an overview of land use regulations and design guidelines relevant to the subject property.

LAND USE

Zoning: The proposed zoning amendment would change the zoning from R14 to R19. A zoning amendment is required for this development proposal because the R14 zone does not permit duplexes. The R19 zone permits single family dwellings and duplexes, and the number of dwelling units permitted is based on parcel size. Given the parcel size of the property, a maximum of two units would be permitted.

Density: The proposed density is 32 units per hectare, which is significantly lower than the 80 units per hectare that is identified as the maximum density for Mixed Residential 2 in the Official Community Plan.

Height: The maximum building height is 9.0m, which is within the maximum height specified in the R19 zone. This height is equal to the maximum height in other residential zones.

Setbacks: The proposed setbacks are as follows: the front lot line setback is 3.0m, the interior lot line setback is 1.5m, the exterior lot line setback is 3.5m and the rear lot line setback is 2.0m. These setbacks are significantly reduced when compared to the setbacks in the R14 zone.

Parcel Coverage: The maximum parcel coverage for R19 is 50%.

Parking: The number of off-street parking spaces required is one space per dwelling unit for multi-family developments. The duplex has two dwelling units, which requires a total of two off-street parking spaces. This proposal meets the parking requirements.

2018 Official Community Plan (OCP):

The property is located within the “Village Neighbourhood” land use designation in the 2018 Official Community Plan (OCP), the area where development, redevelopment and densification are encouraged. The Village Neighbourhood General Policies are as follows:

1. The Town shall support the redevelopment of the “Village Neighbourhood” in a manner that demonstrates the vision of the Sustainability Plan, encouraging expanded services, compact residential development, and tourism facilities while maintaining a strong village character.

Staff Comment: The proposed development is not considered to be a compact residential development, due to the low density being proposed (32 dwellings per hectare) in an area that is designated to accommodate greater density (up to 80 dwellings per hectare).

2. The Town shall discourage owners from restricting occupation or ownership of a residential unit because of age.

Staff Comment: No confirmation has been given regarding age restrictions. If Council is concerned, a covenant could be registered that would prohibit age restrictions.

3. The emphasis of street design shall be pedestrian-friendly, rather than car-friendly.

Staff Comment: The proposed development includes a sidewalk and grass boulevard. Staff recommend that the land for the sidewalk and grass boulevard be dedicated, but that the alignment of the sidewalk, as well as the materials and letdowns to the roadway, be reviewed.

4. In order to support school enrollment, the Town shall explore ways to attract young families to the Town and school catchment area.

Staff Comment: The proposal is for a two-storey duplex. The configuration of the dwelling units would meet the needs of most demographics, including young families.

5. The Town shall require new developments in the Village Neighbourhood to submit a Rainwater Management Plan as part of the development approval and permitting process.

Staff Comment: A rainwater management plan has been submitted. Through the permitting process, staff will work with the applicant to ensure the rainwater management plan meets Town standards.

6. The Town shall discourage multi-family housing projects that seek to separate themselves from the surrounding community by containing the development within walled or fenced enclaves with centralized and/or controlled access points.

Staff Comment: The proposal does not separate itself from the surrounding community.

7. Through various methods including rezonings, regulatory bylaws, incentive programs and education, the Town shall encourage a diversity of housing to meet the needs of people of all ages, income levels and special needs.

Staff Comment: The proposal is for a duplex, which does diversify the Town's housing stock.

8. Through various methods including rezonings, regulatory bylaws, incentive programs and education, the Town shall explore opportunities to improve the energy efficiency of subdivisions and building construction.

Staff Comment: The proposed development will be built to Energy Star or Built Green standards.

9. The Town shall encourage the efficient use of land within the Village Neighbourhood.

Staff Comment: The proposal is a more efficient use of land than a single family dwelling; however, the proposal has a significantly lower density than what is permitted.

10. The Town shall require a site-specific tree and vegetation management and conservation plan for all new development proposals in the Village Neighbourhood.

Staff Comment: A tree and vegetation management plan has not been submitted. The applicant confirmed through correspondence with staff that none of trees on the site will be retained. A landscape plan has been submitted for the property. The landscape plan does not identify any existing trees to be retained; however, boulevard trees have been added.

11. As part of the off-site works and services related to a building permit or subdivision, the Town shall consider the requirement that owners provide for improvements to the street frontage, including sidewalks, street trees, and street lighting.

Staff Comment: The proposed development includes street trees. Prior to adoption of the bylaw, a works and service agreement will be entered into to ensure completion of the adjacent works and services.

12. Buildings should be a maximum of three storeys in height. However, the Town may consider taller buildings on a case-by-case basis with consideration to factors such as topography, solar access, compatibility with adjacent uses, neighbourhood impact, views and community amenities. The Town will also recognize increases in typical ceiling heights in the consideration of height limits.

Staff Comment: The proposed development does not exceed the maximum height outlined in this policy.

The following policies are specific to Mixed Residential 2 designation:

1. The Town recognizes existing single-family and two-family dwellings within the area designated as 'Mixed Residential', as shown on map 'Schedule 2.2'.

Staff Comment: The proposal is for a duplex, which aligns with this policy.

2. The Town will consider rezonings for multi-family residential uses within the area designated 'Mixed Residential', as shown on map 'Schedule 2.2'.
Staff Comment: The subject property is located within the 'Mixed Residential' area. The proposed development is considered to be multi-family residential.
3. The maximum density for multi-family developments in the "Mixed Residential 2" area shall be of up to 80 dwellings/ha. However, the Town will consider density bonuses in order to provide affordable housing, underground parking, 'green' buildings, adaptable design features, public amenities and public open space as part of multi-family residential development within the "Village Neighbourhood".
Staff Comment: The property has a proposed density of approximately 32 dwellings/ha, which is well below the maximum of 80 dwellings/ha.
4. The Town shall develop a suitable multi-family residential zoning for the 'Mixed Residential' area that will encourage small-scale developments in accordance with 'Development Permit Area M1' design guidelines.
Staff Comment: Multi-family residential zoning has not yet been developed.
5. The implementing bylaws and policies of the Town shall ensure that existing trees are retained where possible, as part of the on-site landscape requirements for multi-family residential developments.
Staff Comment: The applicant confirmed through correspondence with staff that none of trees on the site will be retained. A landscape plan has been submitted for the property. The landscape plan does not identify any existing trees to be retained; however, boulevard trees have been added as well as a hedge along Beach Road and Fourth Avenue West.
6. Sidewalks, curbs and gutters, grass boulevards, trees, and pedestrian-friendly streetscapes shall be encouraged as part of multi-family developments.
Staff Comment: The land for a future sidewalk will be dedicated. Council directed the applicant to make a contribution to the Village Neighbourhood Sidewalk Reserve Account equivalent to the value of constructing a sidewalk for this property. A grass boulevard and boulevard trees will be incorporated into the development.
7. Building designs and site development for multi-family residential developments shall conform to the 'Development Permit Area M1' design guidelines.
Staff Comment: The guidelines are discussed later in this memo.
8. The Town shall develop more detailed design guidelines for 'Development Permit Area M1'. After development of design guidelines, the densities for Mixed Residential 1 and Mixed Residential 2 should be reviewed to ensure compatibility with the design guidelines.
Staff Comment: Additional detailed guidelines have not been developed at this time.

Development Permit Area M1 – Village Neighbourhood: The subject property is in the “M1 – Village Neighbourhood” Development Permit Area (DPA). If this development proceeds through the zoning amendment process, Council would consider issuance of a Development Permit in conjunction with adoption of the proposed zoning amendment bylaw. Following is a review of the M1 Development Permit Area Guidelines.

1. Developments shall be at a scale to complement the existing single-family residential uses while creating a transition area for the commercial and institutional uses.

Staff Comment: The scale of the proposed development is within the maximum height for single-family dwellings and complements the existing single-family residential uses.

2. The shape of developments shall avoid massive building components in favour of more intimate clustered designs. Such designs could include varied rooflines, ground floor access to individual units, courtyards and landscaping that stress the human scale of buildings and site improvements.

Staff Comment: The design is at the human scale and includes varied rooflines and ground floor access.

3. Public spaces for community gathering should be integrated into designs wherever possible.

Staff Comment: There are no public spaces for community gathering; however, given the location of the parcel, the size of the parcel and the number of units proposed, it would be difficult to incorporate public spaces.

4. Parking facilities shall be integrated with the site landscaping and buffered from adjoining parcels and buildings on site through the use of trees, shrubs and screens. Smaller clusters are preferable.

Staff Comment: Parking facilities are integrated on the site and additional layby parking is included.

5. Driveways, and off-street parking areas shall be located off lanes and shall be avoided along major and local streets to produce a streetscape that is visually more pleasing and to reduce the conflict with pedestrians.

Staff Comment: The proposed development utilizes access off Beach Road and the laneway, and as a result, the access off of Beach Road is in conflict with this policy. However, it is not feasible to provide both accesses from the laneway.

SUMMARY

The proposed development for 191 Fourth Avenue West requires a rezoning from R14 to R19 to permit a duplex on the parcel. The proposed development is generally aligned with OCP policies and objectives that encourage compact residential development in the 'Village Neighbourhood', housing diversity and multi-family housing types. The proposal is in conflict with the policy that specifies access shall be off of laneways; however, it is not feasible for both parcels to be accessed off the laneway.



Rebecca Augustyn
Planner
Report Writer



Luke Sales, MCIP, RPP
Director of Planning
Concurrence



Daniel Sailland
CAO
Concurrence

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TOWN OF QUALICUM BEACH
BYLAW NO. 580.115

A BYLAW TO AMEND THE TOWN OF QUALICUM BEACH
LAND USE AND SUBDIVISION BYLAW NO. 580, 1999

WHEREAS the Council may, under Section 479 of the *Local Government Act*, divide the municipality into zones, regulate within a zone the use of land, buildings and structures, the density of use of land, buildings and structures, and the siting, size and dimensions of buildings and structures and may, under Section 482 of the *Local Government Act*, establish different density regulations for a zone depending on whether conditions relating to the provision of amenities or affordable or special needs housing are met, and may designate an area within a zone for particular types of housing, and

WHEREAS the owner of the land described in this Bylaw has consented to the designations set out in the Bylaw;

The Council of the Town of Qualicum Beach, in open meeting lawfully assembled, hereby enacts as follows: “Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999” is hereby amended as follows:

1. “Schedule 6A – Zoning Map” is hereby amended by changing the zoning designation of Lot 12, Block 12, District Lot 78, Newcastle District, Plan 1894 from Residential 14 Zone (R14) to Residential 19 Zone (R19) as shown outlined in heavy black line on Schedule ‘A’ which is attached to, and forms part of, this Bylaw.
2. This bylaw may be cited as “Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (191 Fourth Avenue W) Bylaw No. 580.115, 2019.”

INTRODUCED FOR FIRST READING this 16th day of December, 2019.

READ A SECOND TIME this 5th day of February, 2020.

Notice published pursuant to Section 182 of the *Local Government Act* on the 18th day of February, 2020 and the 20th day of February, 2020.

PUBLIC HEARING held this >>> day of >>>, 2020.

READ A THIRD TIME this >>> day of >>>, 2020.

ADOPTED this >>> day of >>>, 2020.

Brian Wiese, Mayor

Heather Svensen, Corporate Administrator

Schedule 'A' - BYLAW NO. 580.115

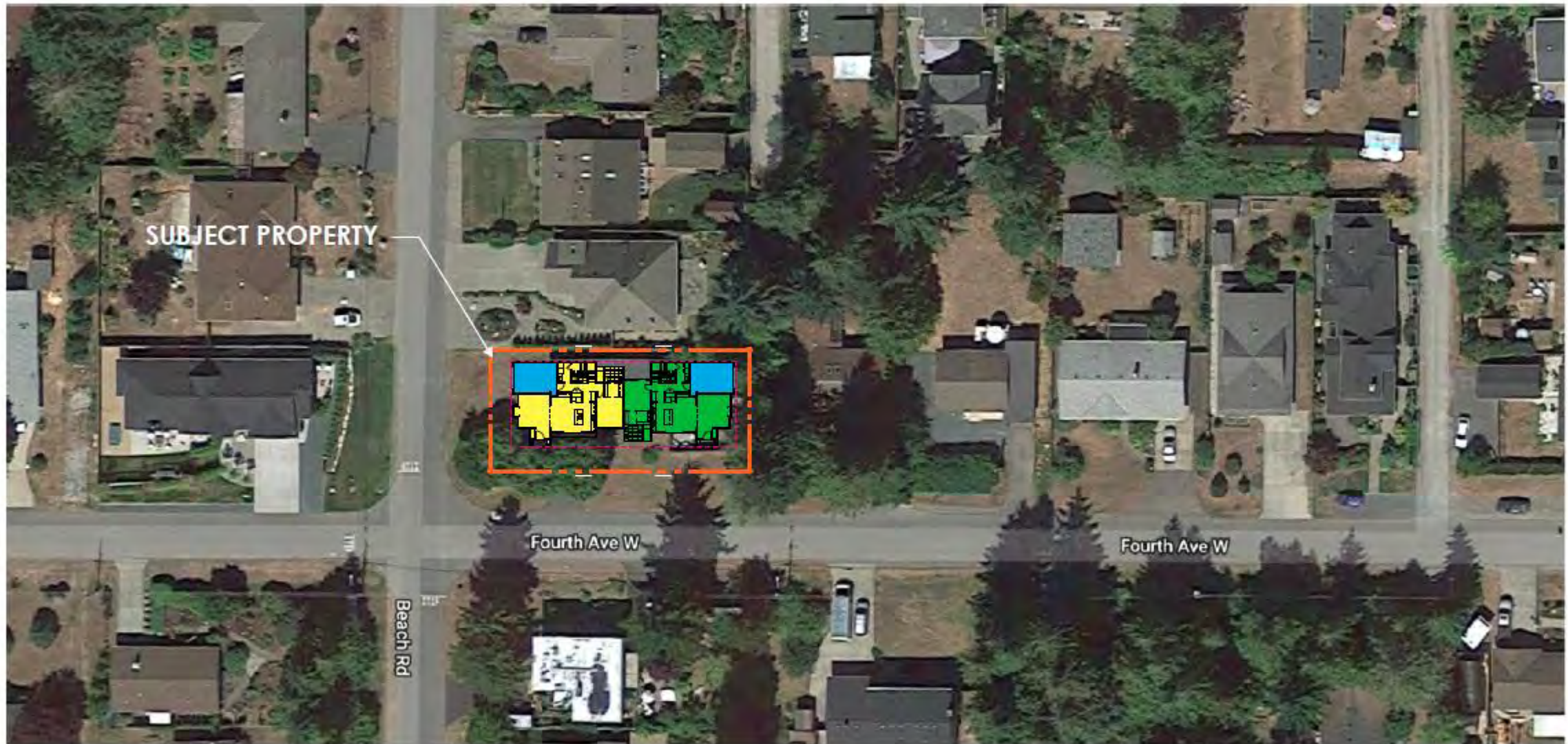




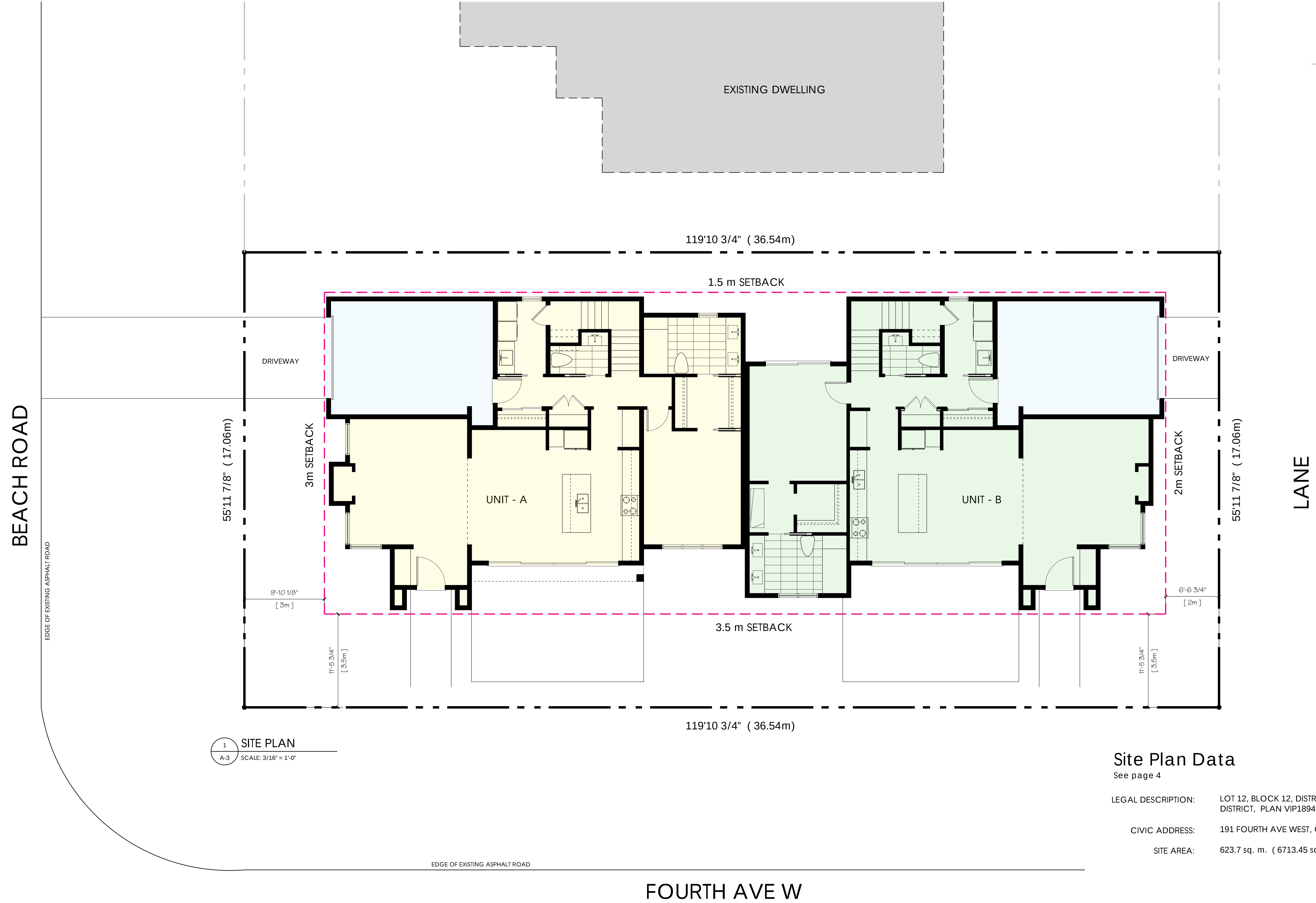
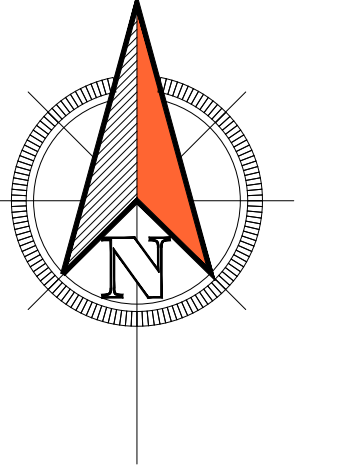
191 FOURTH AVENUE WEST - QUALICUM BEACH



LOCATION MAP
SCALE: NTS



CONTEXT PLAN
SCALE: NTS



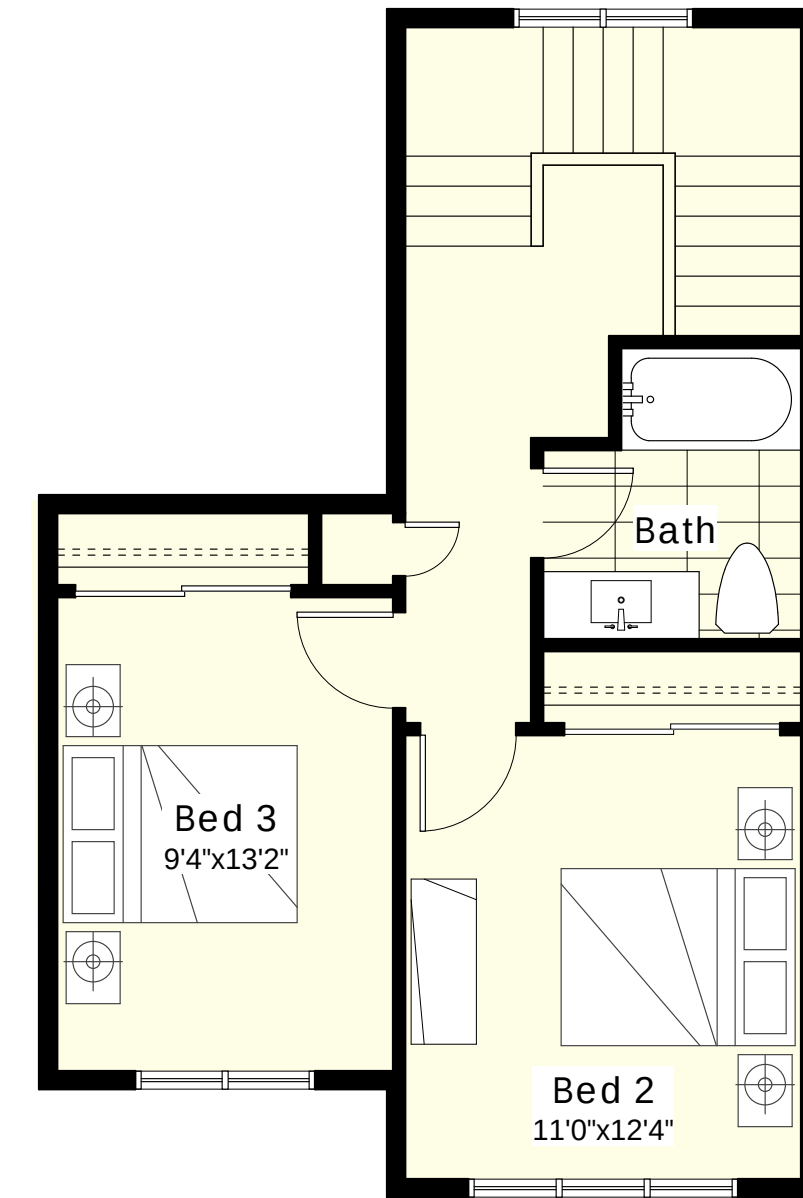
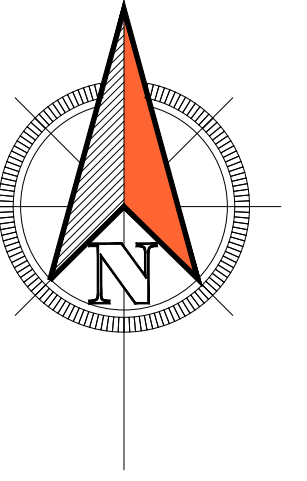
1 SITE PLAN
A-3 SCALE: 3/16" = 1'-0"

Site Plan Data	
See page 4	
LEGAL DESCRIPTION:	LOT 12, BLOCK 12, DISTRICT LOT 78, NEWCASTLE DISTRICT, PLAN VIP1894
CIVIC ADDRESS:	191 FOURTH AVE WEST, QUALICUM BEACH, B.C.
SITE AREA:	623.7 sq. m. (6713.45 sq. ft.)

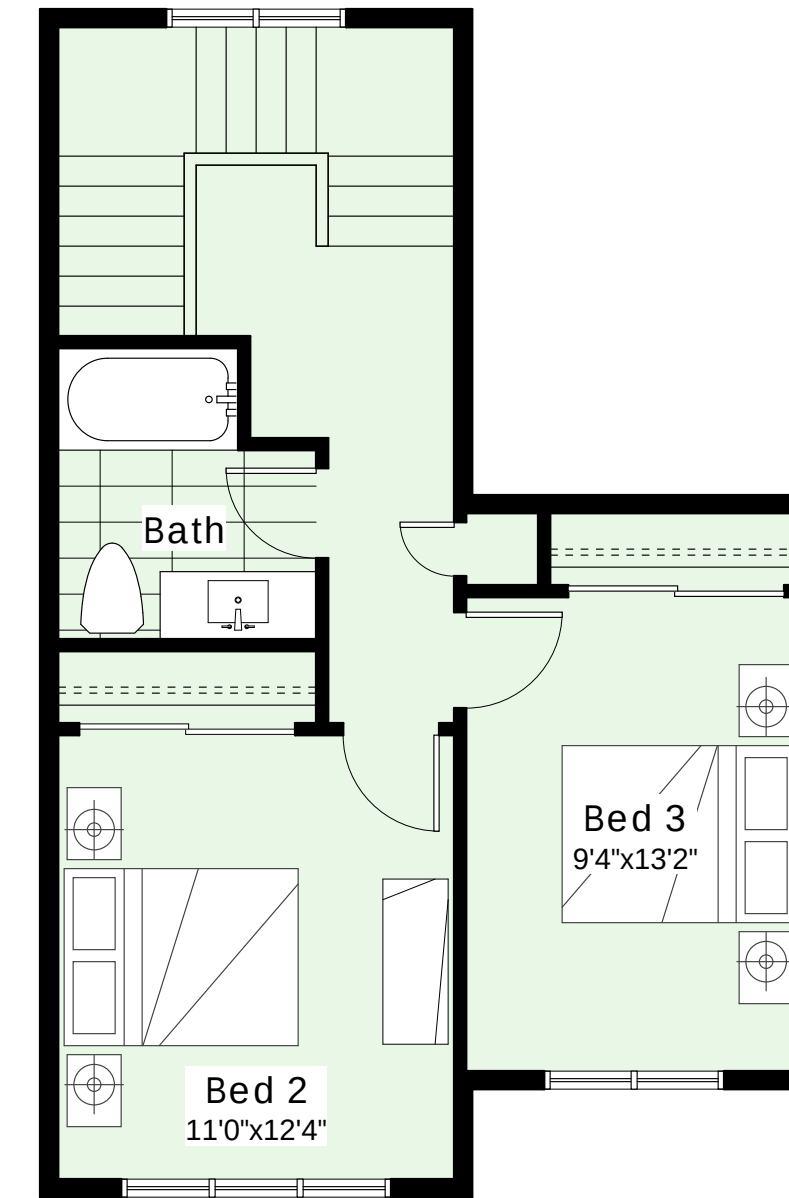
Site Plan Data

LEGAL DESCRIPTION: LOT 12, BLOCK 12, PLAN 1894, NEWCASTLE DISTRICT, DISTRICT LOT 78
CIVIC ADDRESS: 191 FOURTH AVENUE, QUALICUM BEACH, B.C.

STATISTICS	EXISTING	PROPOSED	NOTES
ZONING	RESIDENTIAL 14 (R-4)	RESIDENTIAL 19 (R19)	N/A
OCP LAND USE DESIGNATION	VILLAGE NEIGHBOURHOOD, MIXED RESIDENTIAL 2	VILLAGE NEIGHBOURHOOD, MIXED RESIDENTIAL 2	N/A
PERMITTED USES	Home Occupation, Residential, Bed & Breakfast	Home Occupation, Residential	N/A
PARCEL AREA	624 sq. m. (6714 sq. ft.)	624 sq. m. (6714 sq. ft.)	
PARCEL COVERAGE	42%	50%	(Approximate)
FLOOR AREA RATIO	N/A	N/A	
MAXIMUM HEIGHT	9.0m	9.0m (see notes)	Total designed height of proposed building = 7.1m
SETBACKS			
FRONT	5.5m - 8.0m	3.0m (see notes)	All proposed setbacks are measured to building face Maximum overhang projection 0.6m
REAR	3.0m - 6.0m	2.0m (see notes)	
EXTERIOR SIDE	4.5m	3.5m (see notes)	
INTERIOR SIDE	1.5m	1.5m (see notes)	
INTERIOR SIDE LOT LINE ADJACENT TO A LANE	3m	2.0m (see notes)	



Unit A - Upper Floor
Floor Area = 557 sq. ft.



Unit B - Upper Floor
Floor Area = 557 sq. ft.



Unit A - Main Floor
Floor Area = 1337 sq. ft.
Not Incl. garage

Unit B - Main Floor
Floor Area = 1339 sq. ft.
Not Incl. garage





East Elevation (Right)
Scale = 3/16" = 1'0"



West Elevation (Left)
Scale = 3/16" = 1'0"



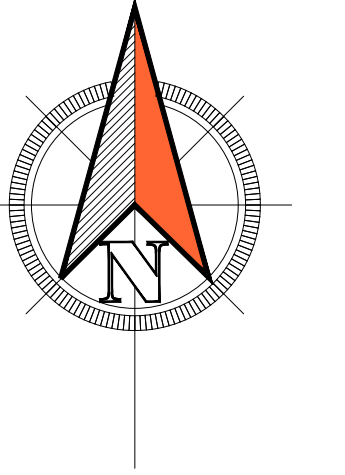
West Perspective (Left)



South West Corner Persepective



South East Corner Persepective



LANDSCAPE PLAN
SCALE: 3/16" = 1'0"



Lewkowich Engineering Associates Ltd.
geotechnical • health, safety & environmental • materials testing

Mr. John Larson
184-C West Second Avenue
Qualicum Beach, BC
V9K 2T5

File No: F7878.01
Date: January 6, 2020

Attention: Mr. John Larson

PROJECT: 191 FOURTH AVENUE WEST, QUALICUM BEACH, BC

SUBJECT: PRELIMINARY RAINWATER MANAGEMENT ASSESSMENT

Dear Mr. Larson:

1. INTRODUCTION

As requested, Lewkowich Engineering Associates Ltd. (LEA) has conducted a preliminary rainwater management assessment regarding the suitability for on-site rain water disposal for the proposed development.

2. BACKGROUND

- a. The proposed development consists of the construction of a residential duplex.
- b. The purpose of the rainwater management assessment was to determine the suitability for on-site storm water disposal measures for the subject development.

3. SURFICIAL GEOLOGY

Based on the existing surficial geology soil maps and previous experience by our firm in proximity to the subject property, we expect the subject site soils consist predominantly of sand and/or sand and gravel. The sand and gravel layers in this area of Qualicum Beach are typically over 10m thick at the ground surface.

4. EXISTING GROUNDWATER CONDITIONS

The soils in the area would be classified as “well drained” suggesting that the subject soils have little to no excess moisture for most of the year. However, ground water levels are expected to fluctuate seasonally, with increased groundwater flows during rainy months.

5. PRELIMINARY OPTIONS FOR STORMWATER MANAGEMENT

Based on our preliminary review of the attached concept plans in relation to our desktop study of the site and expected surficial soils, it is LEA's opinion that the site may be suitable for the following rainwater management measures:

5.1 Roof Drain System

Direct roof leaders to the surrounding ground surface as overland flow or to the existing ditch located on the west side of the property. If directing roof leaders to the surrounding ground surface as overland flows, the roof drains should be directed onto splash pads or another non-erodible surface. To mitigate the potential for surface flows leaving site, the roof drains must be located so not to direct surface flows to the neighboring properties and should be directed into absorbent landscaping areas and/or bioswales. If directing roof water to the existing ditch, ensure that the roof drain outlet is as close to the top of the ditch as possible.

5.2 Perimeter Drain to Rock Pit

- a. Separating the Roof Drains from the Perimeter Drain would isolate the perimeter drain system and allow for the construction of a rock pit in the southwest corner of the property.
- b. Based on the anticipated soil conditions, we expect ground water flows surrounding the proposed foundation to be minimal. Therefore, the size of the proposed rock pit is significantly decreased. We expect that constructing a rock pit to accommodate only the perimeter drain system is achievable given the areal limitations of the property.
- c. Final lot grading surrounding the house foundation should be graded at 2.0% minimum for a distance of 2.0m from the foundation.

Client: Mr. John Larson
Project: 191 Fourth Avenue, Qualicum Beach, BC
File #: F7878.01
Date: January 6, 2020
Page: 3 of 4



6. LIMITATIONS

The preliminary conclusions and recommendations submitted in this report are based upon the data obtained from a visual site assessment and desktop review of the local surficial geology. The nature and extent of soil variations may not become evident until construction or further investigation. The recommendations given are based on the subsurface soil conditions encountered during our Preliminary Rainwater Management Assessment, current construction techniques, and generally accepted engineering practices. No other warrantee, expressed or implied, is made. If unanticipated conditions become known during construction or other information pertinent to the development becomes available, the recommendations may be altered or modified in writing by the undersigned.

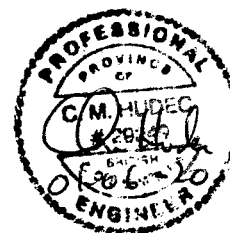
7. CLOSURE

Lewkowich Engineering Associates Ltd. trusts that the information presented above meets your current requirements. If you have any questions, or require further information, please contact us at your convenience.

Respectfully Submitted,
Lewkowich Engineering Associates Ltd.

A handwritten signature in black ink, appearing to read 'LC', is written over a light blue horizontal line.

Louis Chapdelaine, P.Geo
Project Geoscientist



Chris Hudec, M.A.Sc., P.Eng
Senior Project Engineer

Client: Mr. John Larson
Project: 191 Fourth Avenue, Qualicum Beach, BC
File #: F7878.01
Date: January 6, 2020
Page: 4 of 4

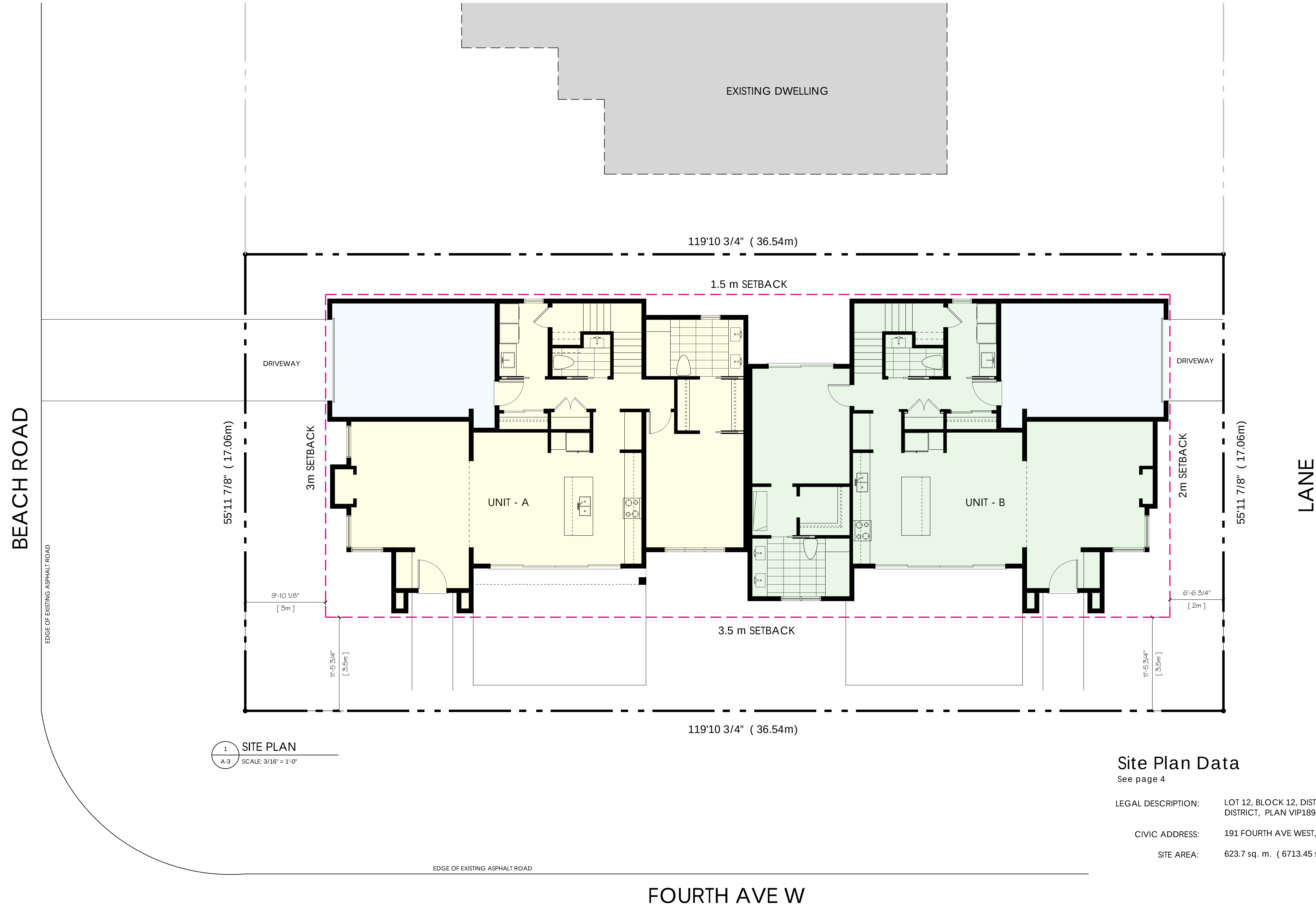
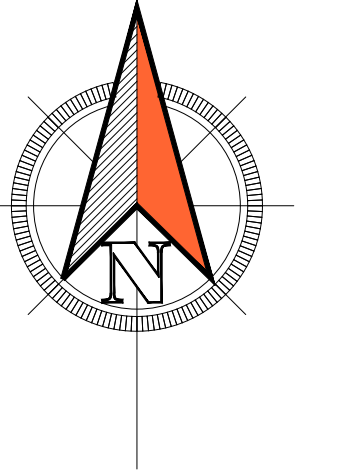


ATTACHMENT

C.A. Design – 191 Fourth Avenue West, Qualicum Beach, BC – Concept Plan, Sheet 4

RESOURCE

1. BC Water Resources Atlas: <http://maps.gov.bc.ca/ess/hm/wrbc/>
2. Soils of South Vancouver Island, British Columbia, Soil Survey Report No. 44, Sheet 3



1 SITE PLAN
A-3 SCALE: 3/16" = 1'-0"

Site Plan Data	
See page 4	
LEGAL DESCRIPTION:	LOT 12, BLOCK 12, DISTRICT LOT 78, NEWCASTLE DISTRICT, PLAN VIP1894
CIVIC ADDRESS:	191 FOURTH AVE WEST, QUALICUM BEACH, B.C.
SITE AREA:	623.7 sq. m. (6713.45 sq. ft.)

Town of Qualicum Beach
MEMORANDUM

TO: Luke Sales, Director of Planning

FOR: Council, February 26, 2020

FROM: Rebecca Augustyn, Planner

SUBJECT: Zoning Amendment: 595 Spruce Street

RECOMMENDATION

For information.

PURPOSE

To provide background information on the application for 595 Spruce Street for the Public Hearing on February 26, 2020.

BACKGROUND

The owner of 595 Spruce Street has made an application to amend the zoning for the subject property to permit two single-family dwellings. The proposal is to subdivide the property into two parcels, with one single-family dwelling on each property. The proposed subdivision would create two separate parcels, both with an area of approximately 582m².

The subject property is currently zoned Residential 14 (R14) and is identified as Mixed Residential 1 in the Official Community Plan. The zoning amendment will change the zoning classification from 'Residential' 14 (R14) to 'Small Lot Residential 1' (SLR1). The SLR1 zone permits one single-family dwelling per parcel, as well as a secondary dwelling in the form of a carriage house or secondary suite. A maximum of two dwelling units are permitted per parcel.

The application has received two readings, went before the Advisory Planning Commission on January 8, 2020, and the applicant hosted a Public Information Meeting on February 18, 2020. The Public Hearing is scheduled for February 26, 2020. On February 5, 2020, Council passed the following motions in relation to the application:

- THAT prior to the bylaw entitled "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (595 Spruce Street) Bylaw No. 580.113, 2019" being adopted, that the developer makes a contribution to the Village Neighbourhood Sidewalk Reserve Account equivalent to the value of constructing a sidewalk for this property.
- THAT the bylaw entitled "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (595 Spruce Street) Bylaw No. 580.113, 2019" be given second reading.
- THAT Council hold a Public Hearing on February 26, 2020 at 3:30 pm at the Qualicum Beach Town Hall, 660 Primrose Street, Qualicum Beach in regard to "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (595 Spruce Street) Bylaw No. 580.113, 2019".
- THAT staff be instructed to review options for registering a covenant to notify any future owners that the density of their property is lower than permitted in the Official Community Plan, and that the neighbourhood may develop at a higher density.

Staff have consulted with legal counsel, who advised:

- Registering a covenant to provide notice to future owners about development potential in the neighbourhood is not necessary from a legal perspective since future Councils always retain the right to amend the zoning.
- The Town should be cautious about putting notices on title as a set practice since doing so means the Town should do this for every zoning amendment in the future.
- The Land Titles Office in recent years has discouraged the use of Section 219 covenants as a notice to future owners so there would have to be some legitimate restriction of use.
- Although legally possible, it is not recommended that the Town put a notice on the property as a courtesy to future owners.

A Public Information Meeting was held by the applicant on February 18, 2020. At this meeting, some of the key concerns that were raised included:

- Removal of trees on the subject property as well as the laneway;
- Access to the subject property from the laneway and the resulting traffic in the laneway;
- Drainage on the property;
- Proposed low density for the site; and,
- Development is not affordable for families.

The bylaw has been amended to include the subdivision district. The parcel is currently designated Subdivision District 'D', which requires a minimal parcel size of 700m². For the parcel to be subdivided to accommodate two single family dwellings on two separate parcels, the Subdivision District is required to be Subdivision District 'J', which requires a minimum parcel size of 500m².



Figure 1: Subject Property

DISCUSSION

Following is an overview of land use regulations and design guidelines relevant to the subject property.

LAND USE

Zoning: The proposed use complies with the SLR1 zone, which permits one single-family dwelling per parcel. The SLR1 zone permits a maximum of two dwellings per parcel, and permits a carriage house or secondary suite in addition to the single-family dwelling.

Density: The proposed density of one unit per parcel (17 units per hectare) is significantly lower than the 60 units per hectare that is identified as the maximum density for Mixed Residential 1 in the Official Community Plan.

Height: The maximum building height under the SLR1 zone is 9.0m. The applicant has confirmed that the proposed development will comply with the maximum height in the SLR1 zone.

Setbacks: The SLR1 setbacks are as follows: front lot line setback to building face is 4.0m, front lot line setback to front facing garage is 6.0m, rear lot line setback is 3.0m and the interior side lot lines are 1.5m. The proposal is to have the garages in the back so the front lot line setback would be to the building face and would be 4.0m.

Parcel Coverage: The maximum parcel coverage for SLR1 is 45%. The applicant has confirmed that the proposed development will meet the SLR1 zoning requirements.

Parking: The off-street parking requirements require two stalls per single family dwelling unit. The garage can accommodate two vehicles; therefore, the applicant meets the requirement for two off-street parking spaces per dwelling unit.

2018 Official Community Plan (OCP):

The property is located within the “Village Neighbourhood” land use designation in the 2018 Official Community Plan (OCP), the area where development, redevelopment and densification are encouraged. The Village Neighbourhood General Policies are as follows:

1. The Town shall support the redevelopment of the “Village Neighbourhood” in a manner that demonstrates the vision of the Sustainability Plan, encouraging expanded services, compact residential development, and tourism facilities while maintaining a strong village character.

Staff Comment: The proposed development is not considered to be a compact residential development due to the low density (17 units per hectare) being proposed.

2. The Town shall discourage owners from restricting occupation or ownership of a residential unit because of age.

Staff Comment: Given that the proposed development is two single family dwellings that are not strata titled, staff do not anticipate age restrictions will be placed on the properties. If Council is concerned, a covenant could be registered on both properties that would prohibit age restrictions.

3. The emphasis of street design shall be pedestrian-friendly, rather than car-friendly.
Staff Comment: The proposed development allocates an area along Spruce Street for a sidewalk in the future. Council directed the applicant to make a contribution to the Village Neighbourhood Sidewalk Reserve Account equivalent to the value of constructing a sidewalk for this property.
4. In order to support school enrollment, the Town shall explore ways to attract young families to the Town and school catchment area.
Staff Comment: The proposal is for single family dwellings that are one-storey, which would meet the needs of most demographics, including young families.
5. The Town shall require new developments in the Village Neighbourhood to submit a Rainwater Management Plan as part of the development approval and permitting process.
Staff Comment: A stormwater management plan has been submitted with a recommendation that each parcel have an on-site rock pit with a swale or perforated drain. The Town's Engineering Department agrees with this recommendation.
6. The Town shall discourage multi-family housing projects that seek to separate themselves from the surrounding community by containing the development within walled or fenced enclaves with centralized and/or controlled access points.
Staff Comment: The proposal does not separate itself from the surrounding community.
7. Through various methods including rezonings, regulatory bylaws, incentive programs and education, the Town shall encourage a diversity of housing to meet the needs of people of all ages, income levels and special needs.
Staff Comment: The proposal for two single family dwellings does not diversify the Town's housing stock.
8. Through various methods including rezonings, regulatory bylaws, incentive programs and education, the Town shall explore opportunities to improve the energy efficiency of subdivisions and building construction.
Staff Comment: The proposed development will meet Energy Star standards.
9. The Town shall encourage the efficient use of land within the Village Neighbourhood.
Staff Comment: The proposal is not an efficient use of land given the low density of the proposal and the housing type.
10. The Town shall require a site-specific tree and vegetation management and conservation plan for all new development proposals in the Village Neighbourhood.
Staff Comment: The applicant submitted a tree inventory report and a revised landscape plan. The revised landscape plan shows three trees per property, in addition to a hedge along Spruce Street.
11. As part of the off-site works and services related to a building permit or subdivision, the Town shall consider the requirement that owners provide for improvements to the street frontage, including sidewalks, street trees, and street lighting.
Staff Comment: Prior to adoption of the bylaw, a works and service agreement will be entered into to ensure completion of the adjacent works and services.

12. Buildings should be a maximum of three storeys in height. However, the Town may consider taller buildings on a case-by-case basis with consideration to factors such as topography, solar access, compatibility with adjacent uses, neighbourhood impact, views and community amenities. The Town will also recognize increases in typical ceiling heights in the consideration of height limits.

Staff Comment: The proposed development is a single-storey and the zoning permits a maximum of two-storeys so the buildings will not exceed the maximum height outlined in this policy.

The following policies are specific to Mixed Residential 1 designation:

1. The Town recognizes existing single-family and two-family dwellings within the area designated as 'Mixed Residential', as shown on map 'Schedule 2.2'.

Staff Comment: The proposed development is for two single-family dwellings, which meets this policy.

2. The Town will consider rezonings for multi-family residential uses within the area designated 'Mixed Residential', as shown on map 'Schedule 2.2'.

Staff Comment: The proposed development is not for multi-family residential.

3. The maximum density for residential dwellings in the Mixed Residential 1 area shall be up to 60 dwellings/ha. However, the Town will consider density bonuses in order to provide affordable housing, underground parking, 'green' buildings, adaptable design features, public amenities and public open space as part of multi-family residential development within the "Village Neighbourhood".

Staff Comment: The property has a proposed density of approximately 17 dwellings/ha, which is well below the maximum of 60 dwellings/ha.

4. The Town shall develop a suitable multi-family residential zoning for the 'Mixed Residential' area that will encourage small-scale developments in accordance with 'Development Permit Area M1' design guidelines.

Staff Comment: The proposed development is not for multi-family residential; therefore, the Development Permit Area M1 guidelines do not apply.

5. The implementing bylaws and policies of the Town shall ensure that existing trees are retained where possible, as part of the on-site landscape requirements for multi-family residential developments.

Staff Comment: The applicant submitted a tree inventory report and a revised landscape plan. No existing trees are to be retained. The revised landscape plan includes three trees per parcel, in addition to a hedge along Spruce Street, which is all located on private property.

6. Sidewalks, curbs and gutters, grass boulevards, trees, and pedestrian-friendly streetscapes shall be encouraged as part of multi-family developments.

Staff Comment: A revised landscape plan has been submitted, which includes designating a portion of the streetscape for a future sidewalk. Two trees along Spruce Street, one tree per parcel, has also been added.

7. Building designs and site development for multi-family residential developments shall conform to the 'Development Permit Area M1' design guidelines.

Staff Comment: The proposed development is for single-family dwellings; therefore, the Development Permit Area M1 design guidelines do not apply. As per Council's motion on January 15, 2020, a Section 219 Covenant outlining design guidelines will be registered on title to ensure the development is built as proposed.

8. The Town shall develop more detailed design guidelines for ('Development Permit Area M1'). After development of design guidelines, the densities for Mixed Residential 1 and Mixed Residential 2 should be reviewed to ensure compatibility with the design guidelines.

Staff Comment: Additional detailed guidelines have not been developed at this time.

SUMMARY

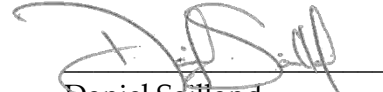
The proposed development for 595 Spruce Street requires a rezoning from R14 to SLR1 to allow two single-family dwellings on two separate parcels. Due to the proposed development being single family dwellings, the Development Permit Area M1 design guidelines do not apply. The proposed development is not a compact development and the proposal does not diversify the housing stock; however, it is a more efficient use of land than what is currently on the parcel and the development is compatible with the neighbourhood. The bylaw has been amended to include the change in Subdivision District, specifically the change from Subdivision District 'D' to Subdivision District 'J'. The change in Subdivision District will permit the parcel being subdivided into two parcels to accommodate the two single family dwellings.



Rebecca Augustyn
Planner
Report Writer



Luke Sales, MCIP, RPP
Director of Planning
Concurrence



Daniel Sailland
CAO
Concurrence

**TOWN OF QUALICUM BEACH
BYLAW NO. 580.113**

**A BYLAW TO AMEND THE TOWN OF QUALICUM BEACH
LAND USE AND SUBDIVISION BYLAW NO. 580, 1999**

WHEREAS the Council may, under Section 479 of the *Local Government Act*, divide the municipality into zones, regulate within a zone the use of land, buildings and structures, the density of use of land, buildings and structures, and the siting, size and dimensions of buildings and structures and may, under Section 482 of the *Local Government Act*, establish different density regulations for a zone depending on whether conditions relating to the provision of amenities or affordable or special needs housing are met, and may designate an area within a zone for particular types of housing, and

WHEREAS the owner of the land described in this Bylaw has consented to the designations set out in the Bylaw;

The Council of the Town of Qualicum Beach, in open meeting lawfully assembled, hereby enacts as follows: "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999" is hereby amended as follows:

1. "Schedule 6A – Zoning Map" is hereby amended by changing the zoning designation of Lot 8, Block 5, District Lot 55, Newcastle District, Plan 2005 from Residential 14 Zone (R14) to Small Lot Residential 1 (SLR1) as shown outlined in heavy black line on Schedule 'A' which is attached to, and forms part of, this Bylaw.
2. "Schedule 7A – Subdivision District Map" is hereby amended by changing the designation of Lot 8, Block 5, District Lot 55, Newcastle District, Plan 2005 from Subdivision District 'D' to Subdivision District 'J' as highlighted and outlined in a heavy black line on Schedule 'A' which is attached to, and forms part of, this Bylaw.
3. This bylaw may be cited as "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (595 Spruce Street) Bylaw No. 580.113, 2019."

INTRODUCED FOR FIRST READING this 16th day of December, 2019.

READ A SECOND TIME this 5th day of February, 2020.

Notice published pursuant to Section 182 of the *Local Government Act* on the 18th day of February, 2020 and the 20th day of February, 2020.

PUBLIC HEARING held this >>> day of >>>, 2020.

READ A THIRD TIME this >>> day of >>>, 2020.

ADOPTED this >>> day of >>>, 2020.

Brian Wiese, Mayor

Heather Svensen, Corporate Administrator

Schedule 'A' - BYLAW NO. 580.113

577	PINE ST	578	579	SPRUCE ST	322
587		586	587		588
601		598	595		596
367		604	603		321
MILL RD					
621	PINE ST	348	336		620
			629		

Fern Road Consulting Ltd.

Our File: 19-211-Z

2019-11-06

Town of Qualicum Beach
201-660 Primrose Street
Qualicum Beach,
B.C. V9K 1S4

Date Received

NOV 07 2019

File No.

3900-20-580.113

☐ Acknowledgement

☐ Response

Letter

Attention: Luke Sales

LS/RA/BW/PC/LH

Dear Luke:

**RE: Proposed Rezoning of Lot 8, Block 5, District Lot 55, Newcastle District,
Plan 2005 – 595 Spruce Street, Qualicum Beach**

On behalf of our client, Heritage Park Homes Ltd., we are submitting an application for a zoning amendment of the above property, from R14, Subdivision District 'D' (minimum lot size 700m²) to SLR1, Subdivision District, 'J' (minimum lot size 500m²) to facilitate a two lot subdivision. Each new lot would be approximately 582m².

BACKGROUND

This 1,164m² lot is on the west side of Spruce Street within the 'Village Neighbourhood' and is designated as Mixed Residential 1 in the Official Community Plan (OCP). There is a laneway running along the rear of the property. The existing older house, approximately in the middle of the property, will be removed prior to completion of the subdivision.

Topography is relatively level and this property contains no environmentally sensitive features.

PROPOSAL

The 'Village Neighbourhood' designation in the OCP encourages a spectrum of housing choices, and the OCP explains it is "desirable to have higher density developments where smaller private areas around residences are compensated by proximity to services, amenities, green spaces, squares, and a livable, attractive neighbourhood". The density proposed is compatible for the surrounding neighbourhood.

Our clients wish to subdivide into two 582m² lots. The width of each lot would be 15.8m which conforms to the Subdivision District 'J' minimum lot width of 12.0m (Bylaw No. 580 – Part 7 – Subdivision Regulations - Section 7.6.3).

As per our conversation, the laneway will be constructed to driveway standards up to the end of this property. CA Design has prepared a set of Plans showing conceptual house designs and siting on the proposed lots. Primary access for the dwellings would be from the laneway with some allowance for street parking on Spruce Street.

In anticipation of this development, a Tree Survey was prepared by Toth and Associates Environmental Services dated September 12, 2019. In addition, a Landscape Plan is being prepared by Cara MacDonald, Landscape Architect, of MacDonald Gray to demonstrate a landscaping plan based on the conceptual house plans.

A Stormwater Management Plan has been prepared by ParkCity Engineering Ltd. and is submitted with this application. An on-site rock pit designed by a geotechnical engineer with swale or perforated drain to the rock pit for each lot is recommended.

ENCLOSURES

In support of this application, we are enclosing:

- Clients cheque for \$4,000
- Bylaw amendment application form
- Title search
- Proposed subdivision plan prepared by Sims Associates Land Surveying Ltd.
- Conceptual house plans prepared by CA Design
- Stormwater Management Plan prepared by ParkCity Engineering Ltd.
- Tree Survey prepared by Toth and Associates Environmental
- Landscape Plan prepared by MacDonald Gray (under separate cover)

We look forward to working with you on this application. Please phone or email me if you need any additional information. We would appreciate this application being on the next Council meeting.

Yours truly,



Rachel Hamling
Enclosures

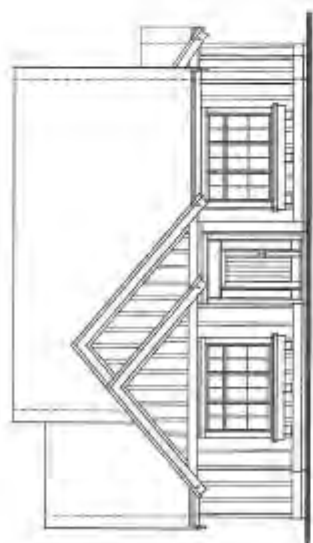


LOT - A

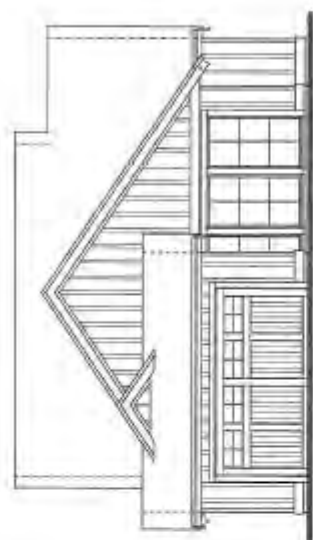


Main Floor Plan

Floor Area = 1,970 sq. ft.



East Elevation (Front)
Scale = 1/4" = 1'-0"



West Elevation (Rear)
Scale = 1/4" = 1'-0"



South Elevation (Side)
Scale = 1/4" = 1'-0"

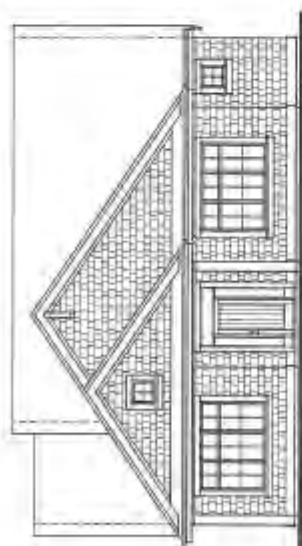




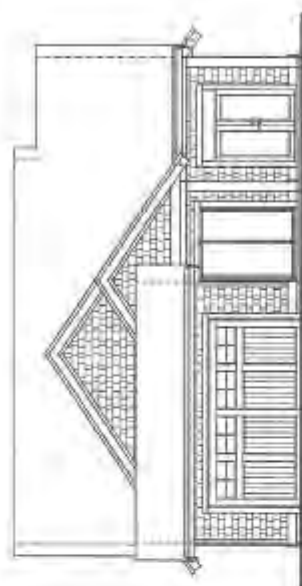
LOT - B



 Main Floor Plan
Floor Area = 1,894 sq. ft.



East Elevation (Front)
Scale = 1/4" = 1'0"



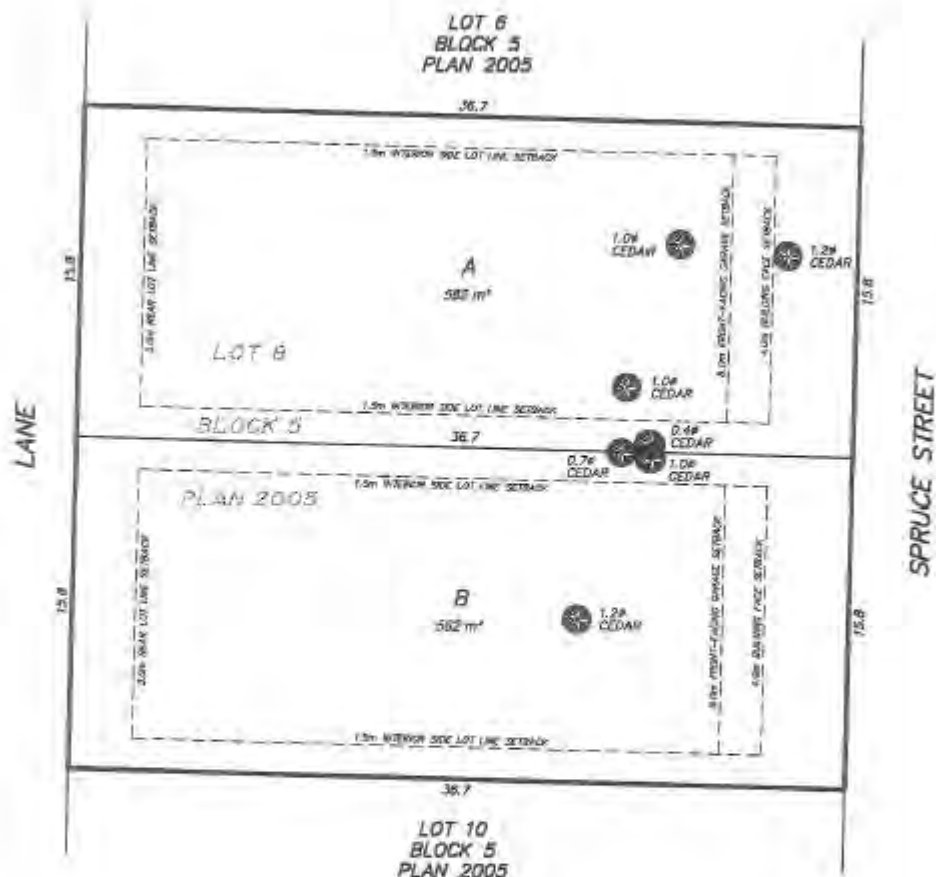
West Elevation (Back)
Scale = 1/4" = 1'0"



South Elevation (Side)
Scale = 1/4" = 1'0"



SCALE 1:200



NOTE:

SETBACKS SHOWN ARE FOR SURF ZONING

LEGEND

ALL DISTANCES ARE IN METRES AND
DECIMALS THEREOF

ALL DISTANCES ALONG CURVES ARE
ARC DISTANCES

ALL DIMENSIONS AND AREA ARE
SUBJECT TO FINAL SURVEY

20 NEWPORT DISTRICT LOT

REM	DENOTES REMANDER
REL	DENOTES RELATIONS
T.OH	DENOTES TREE TYPE
CDIAR	AND DIAMETER (IN METRES)

[illegible]

SIMS ASSOCIATES

LAND SURVEYING LTD.
223 FERN ROAD W.
QUALICUM BEACH, B.C. V0K 1S4
PHONE: 250-752-9121
FAX: 250-752-8241
FILE NUMBER: 19-211-Z
DRAWING NUMBER: 19-211 PLDING



TRIED	BUTTERFLY / COMMON NAME	SIZE	SPACING	QTY.	NOTES
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CHAMBERS WOODHAKES LIBRARY	1.2m	3.0m O.C.	2
WESTING ALASKA CEDAR	1.2m	3.0m O.C.	2
PHILB STROBUS & ASTORIA COLUMNAR PATTERN WHITE PINE			



PARLIS CALIFORNIA CLEVELAND SELECT ORNAMENTAL PEAR	3cm CAL.	SEE PLAN	2
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VIBRIUM TUBES (OENELLIAN) OENELLIAN LAURESTINUS	#1 POT	1.0m O.G.	2.5
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Date:	January 27, 2020
Driver:	CM
Scale:	Not to Scale
Project Number:	19-0251

595 Spruce Street
Heritage Park Homes
Qualicum Beach, BC



Page 67

204 Macmillan Dr., Parkville, MO 64151
TEL: 816.224-7029 FAX: 816.224-7028
www.mccallwright.com



Toth and Associates Environmental Services

6821 Harwood Drive, Lantzville, B.C. V0R 2H0

Tel: (250) 390-7602

E-mail: stoth@shaw.ca

September 12, 2019

Bruce Paddon,

C/o Sims Associates Land Surveying Ltd.

223 Fern Road West,

Qualicum Beach, V9K 1S4



Re: Tree Survey of 595 Spruce Street (PID# 006-628-281), Qualicum Beach.

Toth and Associates Environmental Services conducted an inventory of trees on 595 Spruce Street in Qualicum Beach on September 12, 2019. The 0.1172 ha subject property is not identified as within a Tree Preservation or Tree Protection Area by the Town of Qualicum Beach's Tree Protection Bylaw No. 559, 1995. The subject property is designated as within a Village Neighbourhood Development Permit Area on Schedule 2.3 of the Official Community Plan Bylaw No. 800, 2018. It is our understanding that the proposed development of the property includes subdivision into two lots.

The subject property consists of a previously developed small residential property with an older single family home, gravel driveway, carport, yard, garden and mature trees.

A total of 48 trees were identified on the property. Trees were flagged with blue flagging tape and labelled according to their respective GPS waypoint. The majority of native trees on the subject property are western redcedar, with a few shore pine, grand-fir and 1 western hemlock. Non-native trees included golden chain, chestnut, apple, plum, English holly and chokecherry. Most of the trees on the property appear healthy, although all of the mature redcedar have evidence of wood boring beetle infestation. Several of the trees on the property have poor shape or form either due to shading / competition or as a result of previous topping (e.g. multiple leaders). Several of the mature redcedars on the property are > 100 cm diameter-at-breast-height (dbh).

Table 1 provides details for all of the trees on the property and Figure 1 shows the approximate location of all of the trees on the property. Site photographs are included at the end of this report.

Please contact us if you require any additional information.

Sincerely,

Steve Toth, ASCT, R.P.Bio.

Toth and Associates Environmental Services

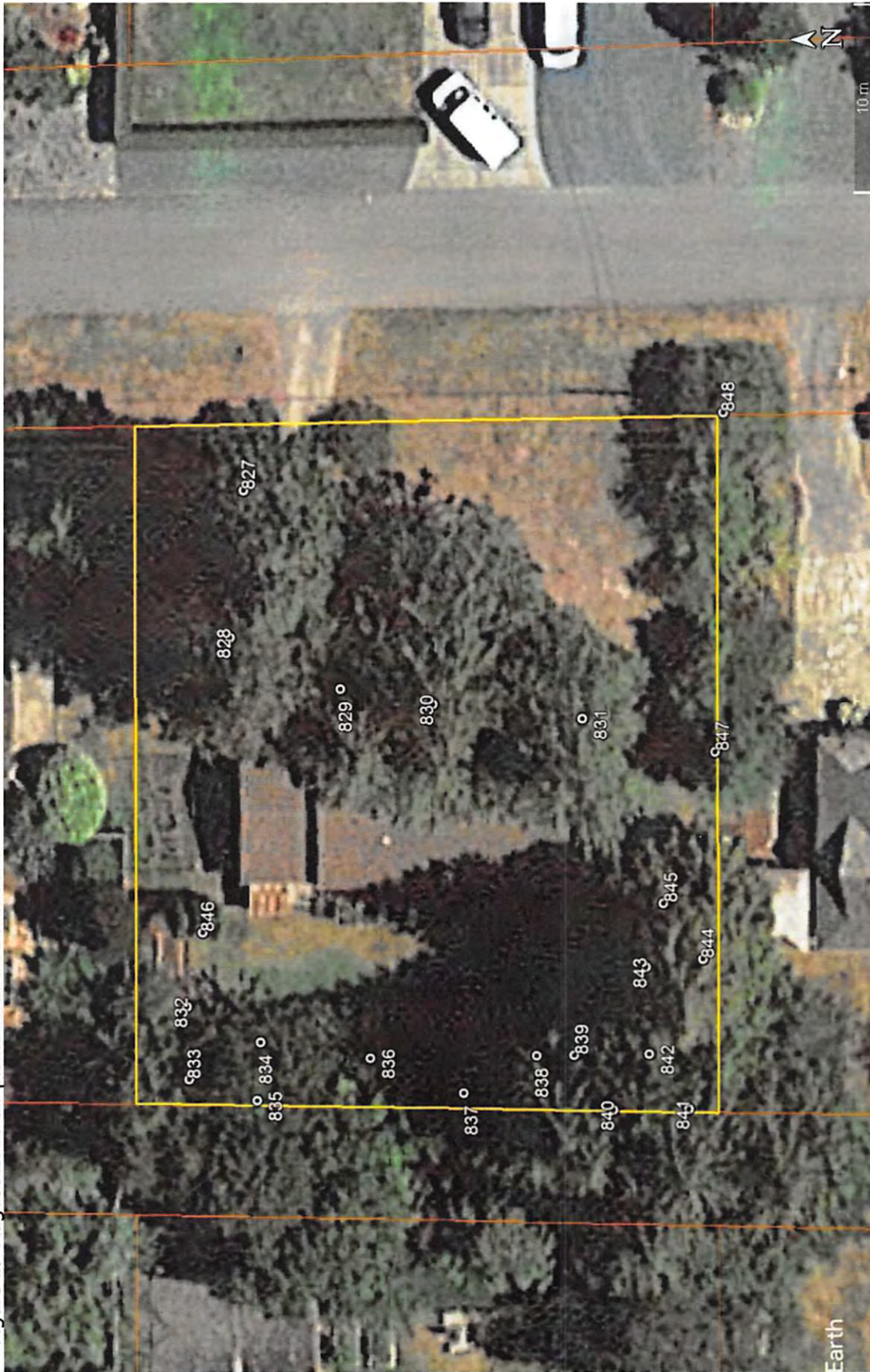


Table 1. 595 Spruce Street - Tree Survey Results

Species Codes: Cw = Western redcedar, Pl = Shore pine, Hw = Western hemlock, Bg = Grand-fir									
Waypoint	UTM Coordinates			Native				Non	Comment
				Cw	Pl	Hw	Bg	Native	
827	10U	394375	5467409	1					100 cm, banana trubk
828	10U	394367	5467410	1					101 cm
829	10U	394364	5467404	1					87 cm
830	10U	394363	5467399	3					95, 71 & 43 cm, clump of 3 joined
831	10U	394362	5467391	1					106 cm, 3 leaders
832	10U	394347	5467413					1	Mature spartan apple
833	10U	394343	5467413	1	4		1		In northwest corner
834	10U	394345	5467409					1	Cherry
835	10U	394342	5467409	2				3	Golden chain (Laburnum sp.)
836	10U	394344	5467403	4				1	Plum
837	10U	394342	5467398					2	1 chestnut, 1 purple plum
838	10U	394344	5467394	1					38 cm
839	10U	394344	5467392	1					69 cm, multi-leader
840	10U	394341	5467390	1					90 cm
841	10U	394341	5467386					1	Chestnut
842	10U	394344	5467388	1					64 cm
843	10U	394349	5467388	1					37 cm
844	10U	394349	5467385	1					34 cm
845	10U	394352	5467387	1					95 cm
846	10U	394351	5467412					3	Cedar hedge
847	10U	394360	5467384						847 - 848 = border of 1 Hw, 2 Bg, 5 Cw, 1 holly and 1 choke cherry
848	10U	394378	5467383	5		1	2	2	
Total Trees:		48	Subtotals:	26	4	1	3	14	

Note: All measurement are diameter-at-breast-height (dbh)

Figure 1. August 2016 air photo with tree locations





Photograph 1. View west from Spruce Street to front yard with cedars (L to R) 831, 830, and 829.



Photograph 2. View east from driveway to Spruce Street with cedars 828 and 827.



Photograph 3. View of pine, cedar and grand-fir bordering fence at waypoint 833.



Photograph 4. View north along the rear fence from waypoint 842.



Photograph 5. View east along the south side of the property.



Photograph 6. View of cedars with multiple leaders at 839 and 842.

Town of Qualicum Beach
MEMORANDUM

TO: Luke Sales, Director of Planning **FOR:** Council Meeting, February 26, 2020

FROM: Rebecca Augustyn, Planner

SUBJECT: Railway Street and Village Way Affordable Housing Zoning Amendment

RECOMMENDATION:

For information.

PURPOSE

To provide background information on the proposed zoning amendment for the Town-owned lands located at Railway Street and Village Way.

BACKGROUND

In March 2019, the Town received approximately 725m² of land located at the intersection of Village Way West and Railway Street from the Province of BC. This land was consolidated with the existing Railway Street and Village Way right of way. Due to the property being a right of way, the zoning from adjacent properties applies half way into the right of way. As a result, the property has multiple zones attached to it, which include institutional and residential. The total area of the parcel is approximately 7,600m². The Town went through a Request for Proposals process and has identified a partner for the affordable housing project, the Qualicum-Parksville Kiwanis Housing Society

On November 20, 2019, the following Notice of Motion was received by Council:

WHEREAS the Strategic Plan timeline aims to “plan and construct an affordable housing project” BE IT RESOLVED THAT the Town-owned land at Railway Street and Village Way West commence first reading on a site-specific Comprehensive Development Zone for an affordable rental housing development.

On December 16, 2019, Council passed the following motion:

THAT Council directs staff to prepare a site-specific amendment to the zoning bylaw that would allow a medium-density attainable housing development on the Town-owned land at Railway Street and Village Way West, for consideration at the January 15, 2020 Regular Council meeting.

On January 15, 2020, Council passed the following motions:

- THAT the bylaw entitled “Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (Part of Village Way and Railway Street) Bylaw No. 580.117, 2020” be introduced and given first reading, as amended by designating the Community Garden and green space area as institutional.
- THAT Council instructs staff to use the word “affordable” in place of “attainable” in all future documentation relating to this housing project.

On February 5, 2020, Council passed the following motions:

- THAT the bylaw entitled “Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (Part of Village Way and Railway Street) Bylaw No. 580.117, 2020” be amended by consolidating the two parcels into one lot.
- THAT the bylaw entitled “Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (Part of Village Way and Railway Street) Bylaw No. 580.117, 2020” be given second reading, as amended.
- THAT Council schedule a Public Information Meeting on February 19, 2020 at 7:00 pm at the Qualicum Beach Civic Centre, 747 Jones Street, Qualicum Beach in regard to “Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (Part of Village Way and Railway Street) Bylaw No. 580.117, 2020”.
- THAT Council hold a Public Hearing on February 26, 2020 at 3:30 pm at the Qualicum Beach Town Hall, 660 Primrose Street, Qualicum Beach in regard to “Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999 Amendment (Part of Village Way and Railway Street) Bylaw No. 580.117, 2020”.

Staff have included the previous survey that shows the parcel as one large parcel rather than two separate parcels. The bylaw has been updated accordingly and the zoning amendment would rezone the whole property as multi-residential, rather than having two separate parcels with two different zoning designations.

On February 19, 2020, the Town hosted a Public Information Meeting. Some of the key concerns raised at this meeting, included:

- Location of the proposed development;
- Proposed density for the subject property;
- Removal of the community garden;
- Removal of trees on the subject property;
- Parking and access to the site;
- Design and village character of the proposed development;
- Tenant selection process; and,
- Public process undertaken by the Town.

The notes taken by staff at the Public Information Meeting are attached to this memo.

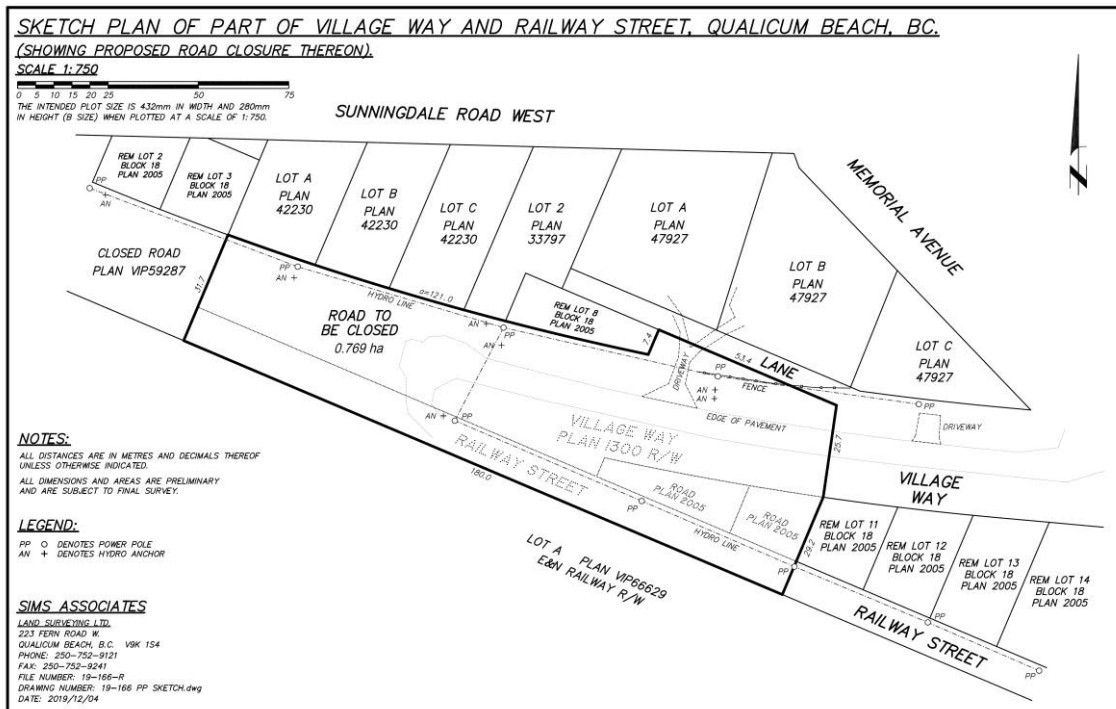


Figure 1: Subject Property

DISCUSSION

Following is an overview of land use regulations and design guidelines relevant to the subject property.

LAND USE

Zoning: The lands are proposed to be rezoned to Residential 20 (R20), which would permit multi-family residential. The R20 zone is a new residential zone that was created for the proposed development at 103 Railway Street.

Density: If the parcel area is 5,000m², under the R20 zone, 40 dwelling units would be permitted outright (excluding density bonuses). Staff anticipate that the housing development would be eligible for the maximum density bonus of 50%, which would comprise of the affordable housing density bonus and the energy efficiency density bonus. Through the density bonuses, the maximum number of dwelling units would increase from 40 dwelling units to 60 dwelling units, which is more than what is currently anticipated for the site.

The subject property is designated Mixed Residential 1 in the Official Community Plan, which outlines a maximum density of up to 60 units per hectare. For a property the size of 5,000m², the maximum number of dwelling units would be 30 units. The maximum number of dwelling units under the R20 zone is higher, however, the density of the site is flexible. For instance, the Town could increase the parcel area to include the total parcel (7,600m²), which would permit a maximum of 45 dwelling units under the Mixed Residential 1 designation, excluding density bonuses. The Town could also decrease the size of the parcel to 2,500m², which would permit a maximum of 12 dwelling units under the Mixed Residential 1 designation, excluding density bonuses.

Height: The maximum building height in the R20 zone is 12.75m, which would permit a three-storey building. The maximum height is higher than the adjacent residential zone.

Setbacks: The setbacks for R20 are as follows: the minimum front lot line setback is 2.7m, the minimum interior lot line setback is 3.0m, the minimum exterior lot line is 3.5m, the minimum rear lot line setback is approximately 2.0m.

Parcel Coverage: The proposed parcel coverage is 61%, which is higher than most other residential zones.

Parking: The number of off-street parking spaces required is one space per dwelling unit. The parking requirements could be varied through the Development Permit process.

2018 Official Community Plan (OCP):

The property is located within the “Village Neighbourhood” land use designation in the 2018 Official Community Plan (OCP), the area where development, redevelopment and densification are encouraged. The property is designated as Mixed Residential in the OCP and falls within Development Permit Area M1 – Village Neighbourhood. Typically, staff would include a detailed review of the project using the OCP policies; however, in this case, the zoning amendment is being prepared prior to any plans being proposed for this property. Since the land is Town-owned, the Town retains complete control over any development. In addition, by rezoning the property to multi-residential early in the process, the risk is reduced for any future partner. Since the property falls within the Development Permit Area M1 – Village Neighbourhood, any plans for a multi-residential development would require a Development Permit approved by Council. As such, any plans for development will go back before Council prior to being built.

SUMMARY

At the February 5, 2020 Council meeting, Council gave second reading to the bylaw, scheduled a Public Information Meeting and Public Hearing, and directed staff to provide the original survey, which shows one large parcel. The Public Information Meeting was held on February 19, 2020. The original survey has been provided and the bylaw has been updated so that the zoning amendment will rezone the whole parcel to multi-family.



Rebecca Augustyn
Planner
Report Writer

Luke Sales, MCIP, RPP
Director of Planning
Report Writer



Daniel Salland
CAO
Concurrence

TOWN OF QUALICUM BEACH
BYLAW NO. 580.117
A BYLAW TO AMEND THE TOWN OF QUALICUM BEACH
LAND USE AND SUBDIVISION BYLAW NO. 580, 1999

WHEREAS the Council may, under Section 479 of the *Local Government Act*, divide the municipality into zones, regulate within a zone the use of land, buildings and structures, the density of use of land, buildings and structures, and the siting, size and dimensions of buildings and structures and may, under Section 482 of the *Local Government Act*, establish different density regulations for a zone depending on whether conditions relating to the provision of amenities or affordable or special needs housing are met, and may designate an area within a zone for particular types of housing, and WHEREAS the owner of the land described in this Bylaw has consented to the designations set out in the Bylaw;

The Council of the Town of Qualicum Beach, in open meeting lawfully assembled, hereby enacts as follows: "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999" is hereby amended as follows:

1. "Part 6 – Land Use Regulations" is hereby amended by adding 'Section 6.4.80.9 Residential 20 (R20) as shown on Schedule 'A' which is attached to, and forms part of, this bylaw.
2. "Schedule 6A – Zoning Map" is hereby amended by changing the zoning designation of "Part of Village Way and Railway Street" to Residential Zone 20 (R20) as shown outlined in a heavy black line and identified as "Road to be Closed" on Schedule 'B' which is attached to, and forms part of, this Bylaw.
3. This bylaw may be cited as "Town of Qualicum Beach Land Use and Subdivision Bylaw No. 580, 1999, Amendment (Part of Village Way and Railway Street) Bylaw No. 580.117, 2020."

INTRODUCED FOR FIRST READING this 15th day of January, 2020.

READ A SECOND TIME this 5th day of February, 2020.

Notice published pursuant to Section 466 of the *Local Government Act* on the 18th day of, February 2020 and the 20th day of February, 2020.

PUBLIC HEARING held on the day of, 2020.

READ A THIRD TIME this day of, 2020.

ADOPTED this day of, 2020.

Mayor

Corporate Administrator

Schedule 'A' – Bylaw No. 580.117

Section 6.4.80.10
(580.110)

RESIDENTIAL 20

R20

Permitted Uses and Minimum Site Area

Permitted Use	Required Site Area
a) Home Occupation Use	n/a
b) Residential Use - per dwelling unit	124 m ²

i. Density Bonus for Amenity

For density bonuses, please refer to Section 6.3(19) "Density Bonuses".

Maximum Number and Size of Buildings and Structures

Accessory buildings	- combined floor area of 10 m ² per dwelling unit
Height	12.75 m
Parcel Coverage	61%
Floor Area Ratio	2.3

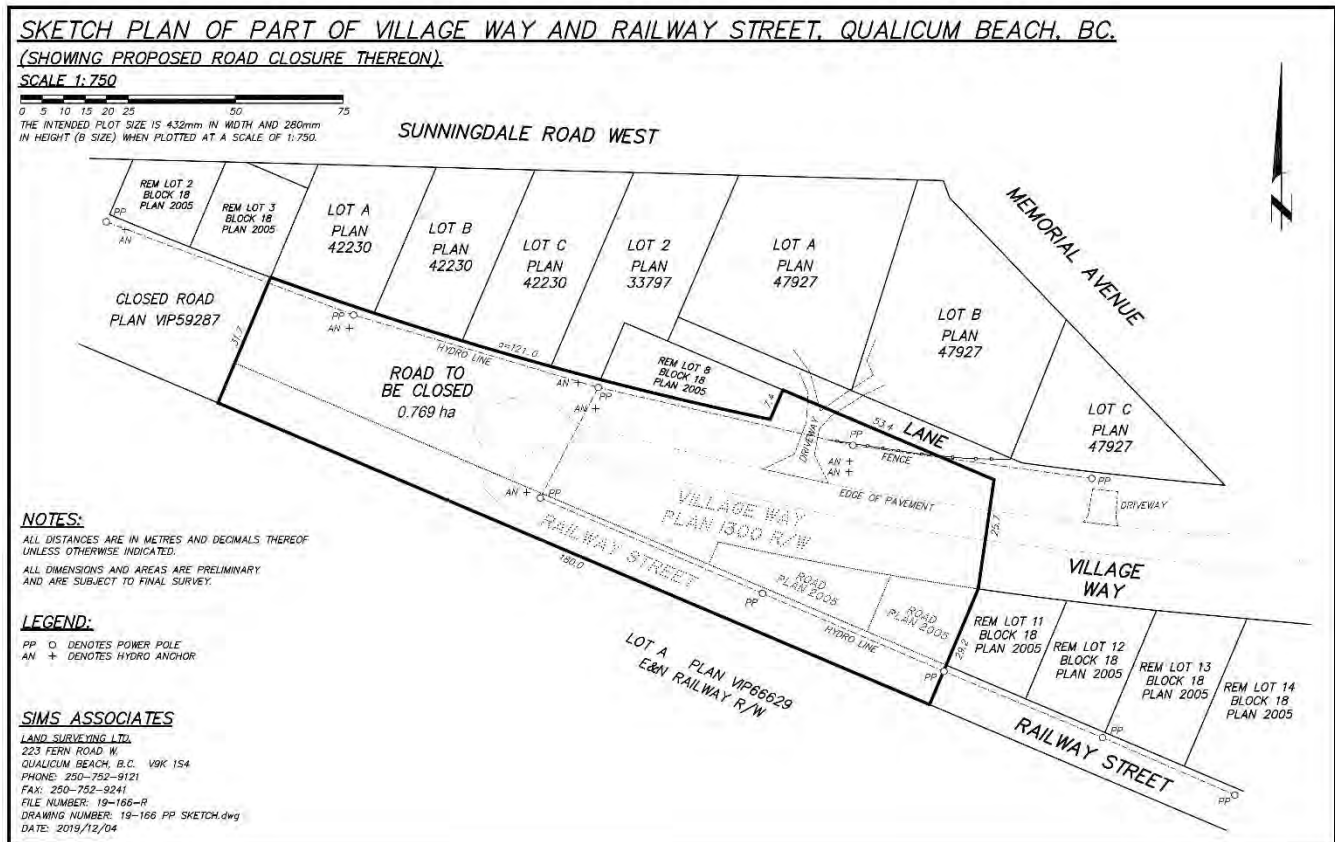
Minimum Setback Requirements

Front lot line	2.7 m
Rear lot line	2.0 m
Exterior side lot line	3.5 m
Interior side lot line	3.0 m

Except:

- a) where any part of a parcel is adjacent to or contains a watercourse then the regulations in Section 3 of this Part shall apply.

Schedule 'B' - Bylaw No. 580.117



**Affordable Housing Project for Railway Street and Village Way
Public Information Meeting Feedback Summary
February 19, 2020**

- Community garden
 - Same place is a good spot
 - Keep where is
 - Orchard (existing)
- Need clear definition of affordable housing
 - Add definition in zoning bylaw of affordable housing
 - Should remain rental
 - 30% low income household - definition
 - Town continue to own/ run by not-for-profit
 - Human scale/ fits in with Town
 - Energy efficient
 - Have green space/ leave trees/ replace trees that are removed
- Integrate community garden in development
- Two-story maximum
 - Large building out-of-place
 - No longer community space if four storeys
- Relax parking requirements because located downtown
 - Parking restrictions on Village Way and Railway Street
 - Need to think more than just standard car ownership
- Consider a daycare as part of development
- Could use slope to integrate parking (like Town Hall)
- Families – kids will want somewhere to play
- Need to think if rail is activated in future
- Think of play areas for children
- Outraged – planning ahead – Town decides to do this and community forced to make comments
- Too much traffic/ don't want high-rise
- Pastoral area
 - Affordable housing should be built on land already paved. i.e. East Village
- Don't clear trees
- East Village better site
- Want to feel like input is on whether or not the zoning amendment goes through rather than commenting on design
- Why not East Village? Where brewery is located.
 - Why was brewery offered land and not Kiwanis
- Turn whole area into a park
- Have road end closer to properties for vehicle access and to retain more greenspace

- Train station should be preserved as green space and be the centre of town
- Info available to Town on needs assessment should be released to public as soon as possible
- Integrate solar/ green technology/ identify certification of green building (i.e. LEED)
- Want to see options for locations and be able to comment on locations for affordable housing
- Don't like three or four story building but two story building be better
- Need housing for working people (i.e. care aides)
- Railway and Village Way is more like a lane
- Building units too much for a lane
- Height is an issue
- Need to handle water on site/ running it down to rain garden won't work
- Town should be consistent
 - Why \$700,000 townhomes in East Village and this site is affordable housing
- Could the Town consider laneway housing?
- Market does not mean affordable
 - Laneway houses not necessarily affordable
- Bike paths/ pedestrian pathways - Transportation Plan
 - Need to keep connections
 - Paths reduce building area
- Trees near Railway Street and rail track important
- Concern over trees - trees have value
- Old Fire Hall could be considered as site for affordable housing
- Talk about density - biggest considerations for site
- Look to Parksville for affordable housing? Number of units in building
- Consider other options - different locations
- No density - have a park instead
- Rely on housing needs assessment to determine what goes on site
- Port Alberni - don't do what they did with their proposal for 47 units
- Put it on land that is not prime land
- Should be everyone that decides not just council
- Concern will become public burden - i.e. maintaining roads/ amenities
- Ask stakeholders - do you want to live there? What types of units/ what density/ townhomes?
- More notification to all of residents/ need more meetings
- Why not show different options for different sites?
- Concerned about where money comes from?
- Concerned about removal trees - impacts economic/ emotional
- Concern - logging for laneway - losing ability to keep moisture/ shade/ trees/ temperature climate/ wildlife
- People per units rather than just units

- Crosswalk would be helpful between Veterans Way & Railway Street
- Fire Hall surrounded by pavement
 - Better site
- Might be better to slow down to be able to discuss site don't have Public Hearing next week February 26, 2020

THE TOWN OF
QUALICUM BEACH



COUNCIL CORRESPONDENCE LOG
February 20, 2020

DATE REC'D	FROM	TOPIC	ACTION
Feb 4-20	29 VARIOUS RECIPIENTS	CELL TOWER – OPPOSED	For info
Feb 4-20	4 VARIOUS RECIPIENTS	CELL TOWER – IN FAVOUR	For info
Jan 29 – Feb 20	29 VARIOUS RECIPIENTS	BUS GARAGE SALE	For info
Feb 20	C MACFIE	595 SPRUCE STREET	For info
Feb 20	B & J MICK	595 SPRUCE STREET	For info
Feb 18	B HOOPER	TELUS CELL TOWER X 2	For info
Feb 18	SITE PATH CONSULTING	CELL TOWER RESPONSE TO B HOOPER	For info
Feb 18	J WOOD	TELUS CELL TOWER	For info
Feb 18	SITE PATH CONSULTING	CELL TOWER RESPONSE TO C DOWE	For info
Feb 18	SITE PATH CONSULTING	CELL TOWER RESPONSE TO J MILLS	For info
Feb 18	M WHITNEY	TELUS CELL TOWER	For info
Feb 18	CFUQPQ	INTERNATIONAL WOMEN'S DAY	For info
Feb 18	R TAYLOR & TOURNAMENT TOUR	URBAN DESIGN & MENTAL HEALTH	For info
Feb 18	WILDERNESS COMMITTEE	CLIMATE CHANGE	For info
Feb 18	S BELANGER	HOYLAKE TRAIL	For info
Feb 18	D SARRIS	HOYLAKE TRAIL	For info
Feb 18	H BAKER	TENT CITIES & MEMORIAL GOLF COURSE	For info
Feb 14	P NYREN	ST ANDREWS LODGE	For Info
Feb 14	C TIDLER	SWIMMING POOL	For Info
Feb 13	A SHARP	TRAIL CLEAR CUT	For Info
Feb 12	J ZWENG	WOUNDED WARRIOR RUN EVENT	For Info
Feb 12	J WOOD	SCHOOL BOARD MTG	For Info
Feb 12	S BELANGER	TRAIL CLEAR CUT	For Info
Feb 12	D SHERRY	TRAIL CLEAR CUT	For Info
Feb 12	VI CRISIS LINE	EMPATHY FOR SUICIDE	For Info
Feb 11	J HINDSON	MUNICIPAL EV INFRASTRUCTUR	For Info
Feb 11	P JACOBSON, C & F DOWE	TOWN LOTS	For Info
Feb 11	G NOBLE & S SHILLINGFORD	TOWN LOTS	For Info
Feb 10	CITY OF PORT MOODY	PHARMACARE PROGRAM SUPPORT	For Info
Feb 10	S STASHUK SANCHEZ	TRAIL CLEAR CUT	For Info

Feb 10	D DURRAN	WEST RIDGE WAY	Refer to staff
Feb 6	D WRAY	HOYLAKES RD CLEAR CUT	For Info
Feb 5	S SMITH	WEST RIDGE WAY	For Info
Feb 5	C MACFIE	ASSET MGMT STRATEGY x 2	For Info
Feb 5	L EATON-AFFORDABLE HOUSING	L EATON-AFFORDABLE HOUSING	For Info
Feb 5	OCEANSIDE HOSPICE	JANUARY NEWSLETTER	For Info
Feb 5	LCRB CANNABIS REGULATION	MINIMUM RETAIL PRICE	For Info
Feb 5	ST STEPHENS CHURCH	THANK YOU	Refer to staff
Feb 4	BC GAMES SOCIETY	BID TO HOST SUMMER GAMES	For Info
Feb 4	B YOUNG	FOURTH AVE & MEMORIAL SITE	For Info
Feb 4	B FLEMING SMITH	VARIOUS COUNCIL ITEMS	Refer to staff
Feb 4	B FLEMING SMITH	G JOHNS, MP	For Info
Feb 3	BC HOUSING ASSOC-HOUSING BULLETIN	BC HOUSING ASSOC-HOUSING BULLETIN	For Info
Feb 3	S FINLEY	COUNCIL	For Info
Feb 3	B & J SPENCER	595 SPRUCE ST REZONING (TREES)	Refer to staff
Jan 31	SITE PATH & TELUS	PROPOSED CELL TOWER 825 VILLAGE WAY	For Info
Jan 31	QB LAWN BOWLING CLUB	TURF ASSESSMENT	For Info
Jan 31	C TERMES	ST ANDREWS NAME	For Info
Jan 28	SOS	50TH ANNIVERSARY BOOK	For Info

Note: Copies of the correspondence listed on the Council Correspondence Log are available to review in the binder at the Municipal Offices information counter, #201 – 660 Primrose Street, Qualicum Beach, BC. The Correspondence Log contains letters not already on a regular agenda, and does not contain form letters/solicitations and letters that are not routinely releasable.

**Town of Qualicum Beach
M E M O R A N D U M**

To: John Marsh, Director of Finance **For:** Regular Meeting February 26, 2020
From: Genelle Conn, Manager of Finance
RE: Finance Monthly Report

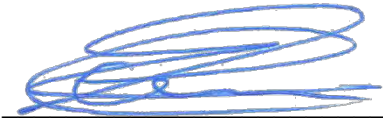
RECOMMENDATION

For Council to receive for information.

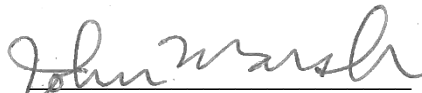
REPORT ANALYSIS

Attached is the Financial Plan Report listing revenues and expenditures to January 31, 2020 with a comparison to January 31, 2019. Revenue and expenditures are within budget expectations at this point early in the year. Please note that the 2020 budget figures are based on the Financial Plan document as at 2nd reading.

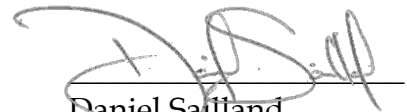
Staff have been very busy finalizing the 2020 to 2024 Financial Plan. Staff are also preparing for the annual audit. The Auditor's will be in Town Hall starting the 2019 audit process on Monday February 26th.



Genelle Conn, CPA, CA
Manager of Finance
Report Writer



John K. Marsh, CPA, CMA
Director of Finance
Concurrence



Daniel Sailland
CAO
Concurrence

**TOWN OF QUALICUM BEACH
FINANCIAL PLAN REPORT - January 31, 2020**

	YTD to Jan 31/20			YTD to Jan 31/19		
	Budget 20	(compared to 2020 budget)		Budget 19	(compared to 2019 budget)	
REVENUES:						
PROPERTY VALUE TAXES						
Municipal Property Taxation						
Municipal Taxation	9,280,000	0	0.0%	8,880,097	-2,094	0.0%
Total Municipal Property Taxation	9,280,000	0	0.0%	8,880,097	-2,094	0.0%
Other Gov't Taxes (this section nets to nil)						
V.I. Regional Library	540,000	0	0.0%	528,420	-126	0.0%
Sewer Tax Rate Levy	1,700,000	0	0.0%	1,630,938	-421	0.0%
Other - Regional District	2,400,000	0	0.0%	2,336,688	-501	0.0%
School District #69	5,150,000	0	0.0%	5,031,001	-1,225	0.0%
Regional Hospital District	540,000	0	0.0%	527,977	-126	0.0%
B C Assessment Authority	133,000	0	0.0%	129,976	-36	0.0%
Municipal Finance Authority	1,000	0	0.0%	1,000	0	0.0%
Sub Total Other Gov't Taxes Collected	10,464,000	0	0.0%	10,186,000	-2,435	0.0%
Less Taxes Paid To Other Gov'ts	-10,464,000	0	0.0%	-10,186,000	-134,591	1.3%
Less Accounts Payable Other Gov'ts	0	0		0		
Total Net Other Gov't Taxes	0	0		0	-137,026	
Grants In Lieu Of Taxes & 1% Utility Tax						
Grants For 1% Utility Taxes	147,000	0	0.0%	143,439	0	0.0%
Grants in Lieu of Property Taxes	269,000	12,500	4.6%	263,646	12,500	4.7%
Total Grants In Lieu Of Taxes	416,000	12,500	3.0%	407,085	12,500	3.1%
PARCEL TAXES - WATER & SEWER						
Parcel Tax - Water	732,000	0	0.0%	796,000	0	0.0%
Parcel Tax - Sewer	163,000	0	0.0%	163,200	0	0.0%
TOTAL PARCEL TAXES	895,000	0	0.0%	959,200	0	0.0%
TOTAL PROPERTY VALUE TAXES	10,591,000	12,500	0.1%	10,246,382	-126,620	-1.2%
FEES AND CHARGES						
Public Works Services	34,000	966	2.8%	34,000	3,924	11.5%
Cemetery Services	46,000	4,650	10.1%	45,000	13,775	30.6%
Waste Removal Fees	600,000	0	0.0%	567,000	0	0.0%
Water Connections	10,000	4,000	40.0%	10,000	5,696	57.0%
Water Rates	1,400,000	0	0.0%	1,300,000	0	0.0%
Sewer Connections	10,000	2,250	22.5%	10,000	2,627	26.3%
Sewer Rates	650,000	0	0.0%	615,000	0	0.0%
TOTAL FEES AND CHARGES	2,750,000	11,866	0.4%	2,581,000	26,022	1.0%

TOWN OF QUALICUM BEACH
FINANCIAL PLAN REPORT - January 31, 2020

	YTD to Jan 31/20			YTD to Jan 31/19		
	Budget 20	(compared to 2020 budget)		Budget 19	(compared to 2019 budget)	
OWN SOURCES						
Licences	96,000	48,950	51.0%	92,800	40,319	43.4%
Permits	130,000	14,015	10.8%	125,000	26,138	20.9%
Leases and Rentals	500,000	48,834	9.8%	500,000	53,500	10.7%
Interest on Investments	60,000	552	0.9%	79,000	631	0.8%
Interest and Penalty on Taxes	52,000	148	0.3%	52,000	58	0.1%
Airport Services	173,000	55,078	31.8%	170,908	58,416	34.2%
Community Hall	34,000	3,174	9.3%	33,314	3,996	12.0%
Civic Centre	134,000	7,431	5.5%	130,600	9,229	7.1%
Contributions and Sales	165,000	0	0.0%	125,000	0	0.0%
Miscellaneous Revenues	62,000	5,241	8.5%	61,000	2,991	4.9%
TOTAL OWN SOURCES	1,406,000	183,423	13.0%	1,369,622	195,278	14.3%
GOVERNMENT GRANTS						
Revenue Sharing	467,000	0	0.0%	467,000	0	0.0%
Other Government Grants	2,688,000	0	0.0%	2,995,000	0	0.0%
RDN Fire and Other Services	280,000	0	0.0%	260,000	0	0.0%
Gas Tax Grants	432,000	0	0.0%	440,000	0	0.0%
TOTAL GOVERNMENT GRANTS	3,867,000	0	0.0%	4,162,000	0	0.0%
GRAND TOTAL REVENUES	18,614,000	207,789	1.1%	18,359,004	94,680	0.5%
EXPENDITURES:						
DEBT CHARGES						
Miscellaneous Interest	26,000	0	0.0%	26,000	246	0.9%
Debt Interest	60,000	0	0.0%	70,000	0	0.0%
Debt Principal	463,000	0	0.0%	463,000	0	0.0%
TOTAL DEBT CHARGES	549,000	0	0.0%	559,000	246	0.0%
CAPITAL EXPENDITURES						
General Capital	9,332,000	357,280	3.8%	9,230,958	9,678	0.1%
Water Capital	755,000	0	0.0%	415,000	20,087	4.8%
Sewer Capital	340,000	0	0.0%	40,000	0	0.0%
TOTAL CAPITAL EXPENDITURES	10,427,000	357,280	3.4%	9,685,958	29,765	0.3%
OTHER MUNICIPAL PURPOSES						
General Government						
Legislative Services	253,000	16,250	6.4%	245,000	22,010	9.0%
Grants in Aid & Tax Exemptions	246,000	20,000	8.1%	242,000	20,000	8.3%
Office Maintenance	165,000	29,573	17.9%	184,000	16,378	8.9%
Administrative Services	1,157,000	107,631	9.3%	1,099,000	101,669	9.3%
Common Services	390,000	80,530	20.6%	371,000	67,826	18.3%
Total General Government	2,211,000	253,984	11.5%	2,141,000	227,883	10.6%

TOWN OF QUALICUM BEACH
FINANCIAL PLAN REPORT - January 31, 2020

	YTD to Jan 31/20			YTD to Jan 31/19		
	Budget 20	(compared to 2020 budget)		Budget 19	(compared to 2019 budget)	
Protective Services						
RCMP Police Protection	1,421,000	118,400	8.3%	1,360,000	113,000	8.3%
Other Protective Services	483,000	32,763	6.8%	471,000	55,565	11.8%
Fire Department Services	1,005,000	79,342	7.9%	868,000	84,650	9.8%
Total Protective Services	2,909,000	230,505	7.9%	2,699,000	253,215	9.4%
Transportation Services						
P/W Administration	605,000	53,799	8.9%	711,000	48,457	6.8%
P/W Yard	110,000	15,722	14.3%	85,000	7,423	8.7%
Roadway Surfaces	270,000	4,227	1.6%	235,000	4,822	2.1%
Road Allowances	110,000	4,584	4.2%	115,000	3,525	3.1%
Sidewalk Maintenance	66,000	4,228	6.4%	64,000	6,904	10.8%
Drainage Ditches	52,000	6,528	12.6%	70,000	2,764	3.9%
Storm Sewers	144,000	14,464	10.0%	102,000	8,981	8.8%
Street Cleaning	65,000	1,526	2.3%	67,000	3,230	4.8%
Snow and Ice Removal	115,000	63,303	55.0%	89,000	6,523	7.3%
Signs and other	66,000	3,811	5.8%	64,000	7,593	11.9%
Street Lighting	192,000	1,326	0.7%	187,000	1,502	0.8%
Airport Services	205,000	17,918	8.7%	172,000	5,965	3.5%
Equipment Operating	613,000	100,406	16.4%	590,000	97,711	16.6%
Total Transportation Services	2,613,000	291,842	11.2%	2,551,000	205,400	8.1%
Environmental And Public Health						
Solid Waste Removal	81,000	5,633	7.0%	81,000	14,492	17.9%
Other Solid Waste	104,000	12,139	11.7%	92,000	6,620	7.2%
RDN Food Waste, Recycling & Garbage	614,000	322	0.1%	580,000	281	0.0%
Water Maintenance	1,108,000	54,361	4.9%	1,055,000	56,745	5.4%
Sewer Maintenance	273,000	21,722	8.0%	219,000	17,276	7.9%
Total Environmental Services	2,180,000	94,177	4.3%	2,027,000	95,414	4.7%
Community Development						
Planning and Zoning	383,000	30,576	8.0%	345,000	25,318	7.3%
Community Dev - Chamber & D/T	79,000	14,000	17.7%	76,000	0	0.0%
Community Dev - Museum	98,000	69,598	71.0%	92,000	0	0.0%
Community Dev - Social Procurement Hub	0	0	0.0%	100,000	0	0.0%
Community Dev - Special Events	152,000	12,791	8.4%	103,000	6,906	6.7%
Community Dev - St. Andrews	95,000	1,016	1.1%	100,000	8,983	9.0%
Community Dev - Town Functions	401,000	13,355	3.3%	216,000	20,292	9.4%
Total Community Development	1,208,000	141,336	11.7%	1,032,000	61,499	6.0%
Parks And Recreation						
Administration & Supervision	308,000	23,142	7.5%	302,000	28,891	9.6%
Parks Yard	50,000	5,934	11.9%	54,000	5,136	9.5%
Civic Centre & Community Hall	384,000	28,995	7.6%	382,000	28,889	7.6%
Parks/Cultural Buildings	49,000	2,763	5.6%	51,000	5,585	11.0%
Community Park	167,000	16,401	9.8%	167,000	20,140	12.1%
Garden/Park Areas	486,000	21,611	4.4%	469,000	23,781	5.1%
Trails	115,000	5,333	4.6%	110,000	4,980	4.5%

**TOWN OF QUALICUM BEACH
FINANCIAL PLAN REPORT - January 31, 2020**

	Budget 20	YTD to Jan 31/20 (compared to 2020 budget)		Budget 19	YTD to Jan 31/19 (compared to 2019 budget)	
Beach Areas	130,000	2,738	2.1%	108,000	4,975	4.6%
Other Park Functions	87,000	3,074	3.5%	90,000	3,337	3.7%
Public Health (Cemetery)	55,000	1,931	3.5%	55,000	1,313	2.4%
Total Parks And Recreation	1,831,000	111,922	6.1%	1,788,000	127,027	7.1%
Sub Total General Municipal Purposes	11,571,000	1,047,683	9.1%	10,964,000	896,417	8.2%
Sub Total Water Municipal Purposes	1,108,000	54,361	4.9%	1,055,000	56,745	5.4%
Sub Total Sewer Municipal Purposes	273,000	21,722	8.0%	219,000	17,276	7.9%
TOTAL OTHER MUNICIPAL PURPOSES	12,952,000	1,123,766	8.7%	12,238,000	970,438	7.9%
GRAND TOTAL EXPENDITURES	23,928,000	1,481,046	6.2%	22,482,958	1,000,449	4.4%
TOTAL NET EXPENDITURES	-5,314,000	-1,273,257		-4,123,954	-905,769	
NON OPERATING ITEMS AND TRANSFERS						
Other Non Operating Items						
DCC Transfers	0	0	0.0%	0	0	0.0%
Proceeds from Borrowing	875,000	0	0.0%	0	0	0.0%
Proceeds from Sale Of Assets	3,517,000	0	0.0%	3,785,000	0	0.0%
Total Other Non Operating Items	4,392,000	0	0.0%	3,785,000	0	0.0%
Other Non Operating Transfers						
Transfer from Reserve - General	505,000	0	0.0%	402,954	0	0.0%
Transfer from Reserve - Water	481,000	0	0.0%	0	0	0.0%
Transfer to Reserve - Funds	-14,000	0	0.0%	-14,000	0	0.0%
Transfer to Reserve - Water	-50,000	0	0.0%	-50,000	0	0.0%
Total Other Non Operating Transfers	922,000	0	0.0%	338,954	0	0.0%
Other Non Cash Items						
Amortization of Assets	3,300,000	275,000	8.3%	3,250,000	258,429	8.0%
Net Non Cash Items	-3,300,000	-275,000	8.3%	-3,250,000	-258,429	8.0%
Total Other Non Operating Items	0	0	0.0%	0	0	0.0%
TOTAL ITEMS & TRANSFERS	5,314,000	0	0.0%	4,123,954	0	0.0%
FINANCIAL PLAN BALANCE	0	-1,273,257		0	-905,769	

Town of Qualicum Beach
M E M O R A N D U M

TO: Daniel Sailland, CAO

FOR: Council Meeting, February 26, 2020

FROM: Robert Daman, Emergency Program Coordinator

SUBJECT: New Hazard, Risk and Vulnerability Analysis (HRVA)

RECOMMENDATION

THAT the report from the Emergency Program Coordinator entitled "New Hazard, Risk Vulnerability Analysis (HRVA)" be received for information.

PURPOSE

Receiving this report triggers support for staff to move forward with releasing the completed plan for public consumption. Public awareness of what the hazards are for the region will help with personal and family preparedness. In addition, staff will begin to move forward with the creation of contingency plans and mitigation measures to reduce the risks and vulnerabilities associated with each hazard.

BACKGROUND

In June of 2018, the Town of Qualicum Beach, City of Parksville and Regional District of Nanaimo came together to create a new comprehensive Hazard, Risk and Vulnerability Analysis for the region. The HRVA covers the Town of Qualicum Beach, City of Parksville and Electoral Areas A, B, C, E, F, G, and H.

The City of Nanaimo recently created an HRVA for the area within their boundary, therefore, did not require a new analysis and were not included. The City of Nanaimo was invited to be a stakeholder in this analysis process.

Creating the new HRVA was an 18 month process with Critical Continuity and Emergency Management Strategies (CCEM) selected as the consultant to design and organize the process and final document. Most of the funding for this project came from a grant obtained by the Town of Qualicum Beach and RDN from the National Disaster Mitigation Program (NDMP) for the creation of a flood risk assessment. The City of Parksville has a flood assessment, therefore, only participated in the HRVA portion of this study.

Over 70 stakeholders from all levels of government from varying departments, First Nations communities, first responders, industry, scientists and other subject matter specialists were engaged to create the HRVA. Using historical data, previous HRVAs, provincial and federal HRVA design models, a list of 53 natural and human caused hazards was created. The list was ranked considering the risk of the hazard, vulnerability of the population and infrastructure along with the potential consequences due to the hazard.

As a cornerstone document for the emergency program, the document can be used to inform the public on hazards they need to be prepared for. In addition, the stakeholders involved to create the HRVA can be brought together to help in the creation of contingency plans for each hazard. The resulting plans will help the emergency program assist everyone involved during a specific emergency work

together in an efficient effective way to quickly address the issue and bring the community back to the new normal as quickly as possible. Engaging stakeholders will help everyone understand their role during an emergency, reducing confusion and duplication of work.

DISCUSSION

1. Identifying the risks and vulnerabilities associated with hazards will help create plans for the mitigation, response and recovery from the hazard and will enhance the level of service provided to the public by making the document available to the public as a tool towards their personal, family and business emergency preparedness.
2. There is no financial impact associated to this document moving forward. The HRVA will only help to inform the priority of work to be completed. Costs associated to the development of the HRVA was approved and spent in the 2019 budget cycle.
3. Alternative direction would be needed if Council wishes to pursue a different course of action.

STRATEGIC PLAN ALIGNMENT

The HRVA supports Council's Strategic Plan by promoting the Values of Teamwork, Collaboration, and Cooperation amongst the municipalities and surrounding Regional District. This agreement also promotes the efficient provision of services by sharing resources to achieve a common goal of providing information to residents in our area and, potentially, local First Nations and west coast communities.

SUMMARY

The Hazard, Risk and Vulnerability Analysis (HRVA) is a study to identify hazards and risks, which will most likely impact a community when they occur. The purpose of the HRVA is to help the community make risk based choices to address vulnerabilities; and mitigate, prepare for, respond to, and recover from hazard events. The HRVA is a cornerstone document for every emergency program. From the HRVA, contingency plans are developed to address each hazard specified in the document allowing for a more organized and timely response followed by recovery from the emergency. In addition, the HRVA can help inform priorities for future development and infrastructure to help mitigate hazards before they happen.

Emergency Management Oceanside (EMO) was formed to address capacity and efficiency gaps by having the Town of Qualicum Beach, City of Parksville and Regional District of Nanaimo work together to serve residents within the region in a more effective manner. Additionally, Emergency Management BC (EMBC) is releasing a new HRVA toolkit designed to provide standard practices to local governments for developing a new HRVA. EMO worked with EMBC to use the, yet to be released, tool kit for the creation of this document. As such, this HRVA document has utilized the most recent provincial toolkit. Making a single HRVA for the region was a more cost effective solution to better serve residents of the region rather than having three separate studies.

ALTERNATIVES

1. Provide alternative direction to staff.

for 
Robert Daman
Emergency Program Coordinator
Concurrence


Daniel Sailland
Chief Administrative Officer
Concurrence



**REGIONAL DISTRICT OF NANAIMO, TOWN OF QUALICUM BEACH,
AND CITY OF PARKSVILLE**

SEPTEMBER 2019

PREPARED FOR:



**TOWN OF
QUALICUM BEACH**



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Contact: info@ccemstrategies.com

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Limitation of Liability

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The material in this report reflects the professional judgement of CCEM in light of the information available at the time of preparation and completion. This report was prepared based, in part, on information obtained from peer-reviewed articles, grey literature, and subject matter experts. In conducting the assessment, CCEM has acted in good faith on the information provided.

The contents may be used and relied upon by the officers and employees of the Regional District of Nanaimo, Town of Qualicum Beach, and City of Parksville, as well as all Electoral Areas, municipalities, and First Nation communities within the regional district of Nanaimo. Any use of this report by third parties, or any reliance on or decisions made based upon it, are the responsibility of such third parties. CCEM accepts no responsibility for damages suffered by a third party as a result of decisions made based on this report.

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CITATION

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Acknowledgements

PROJECT SPONSORSHIP

This Hazard, Risk and Vulnerability Analysis (HRVA) was conducted collaboratively, with project sponsorship provided by:

- Regional District of Nanaimo – Director, Transportation and Emergency Services
- Town of Qualicum Beach – Chief Administrative Officer
- City of Parksville – Chief Administrative Officer

The assessment was made possible with support from Public Safety Canada and the National Disaster Mitigation Program (NDMP), which was established in 2014 as part of the Government of Canada's commitment to building safer and more resilient communities.

PRODUCTION TEAM

The assessment was facilitated by a team of consultants from CCEM Strategies Ltd.

The Project was led by the following:

- Regional District of Nanaimo – Melissa Tomlinson, Emergency Planning Coordinator,
- Town of Qualicum Beach – Rob Daman, Emergency Program Coordinator, and
- City of Parksville – Aaron Dawson, Emergency Program Coordinator

COMMUNITY REPRESENTATIVES & STAKEHOLDERS

The Project Sponsors and Production Team wish to acknowledge the support and contributions of the many local government and First Nation community representatives, subject matter experts, and other agency stakeholders who attended the engagement sessions and provided input and expertise to inform the process.

Executive Summary

The Regional District of Nanaimo (RDN), Town of Qualicum Beach, and the City of Parksville recently partnered to undertake a Hazard, Risk and Vulnerability Analysis (HRVA) with the goal of enhancing their cooperative approach to emergency management and generating a foundation for the next phase of preparedness and mitigation activities, while increasing the capacity and resiliency of the region.

The purpose of a Hazard, Risk and Vulnerability Analysis (HRVA) is to “help community leaders make risk-based choices to address vulnerabilities, mitigate hazards and prepare for response and recovery from emergencies” (EMBC, 2004). Risk assessments, such as HRVAs, are a regulatory requirement of local governments.

This HRVA provides a comparison of risks posed to the region across the full spectrum of hazards, including natural, technological, and conflict-related hazards. By providing a view of the relative risks across all hazards, local decision-makers are better able to prioritize risk management and emergency preparedness activities by focusing on the hazards that pose the greatest risk.

APPROACH

Engagement

Community engagement was a key component of the risk assessment. A series of engagement sessions were held to help identify potential hazards, gather perceptions of hazard consequences, and explore local vulnerabilities and resiliency strategies. The engagement sessions also served to strengthen inter-agency relationships and build a shared understanding of risks posed to the region. Engagement participants included representatives from government and non-government agencies, first responders, Indigenous community members, industry stakeholders, neighbouring community members, and subject matter experts.

Hazard Identification & Risk Assessment

The project team worked together to identify a list of hazards that could affect the region by surveying existing tools and reports, reviewing historical data, and consulting community members and subject matter experts. Ultimately [53 hazards](#), categorized as either natural, technological, or conflict-related, were identified.

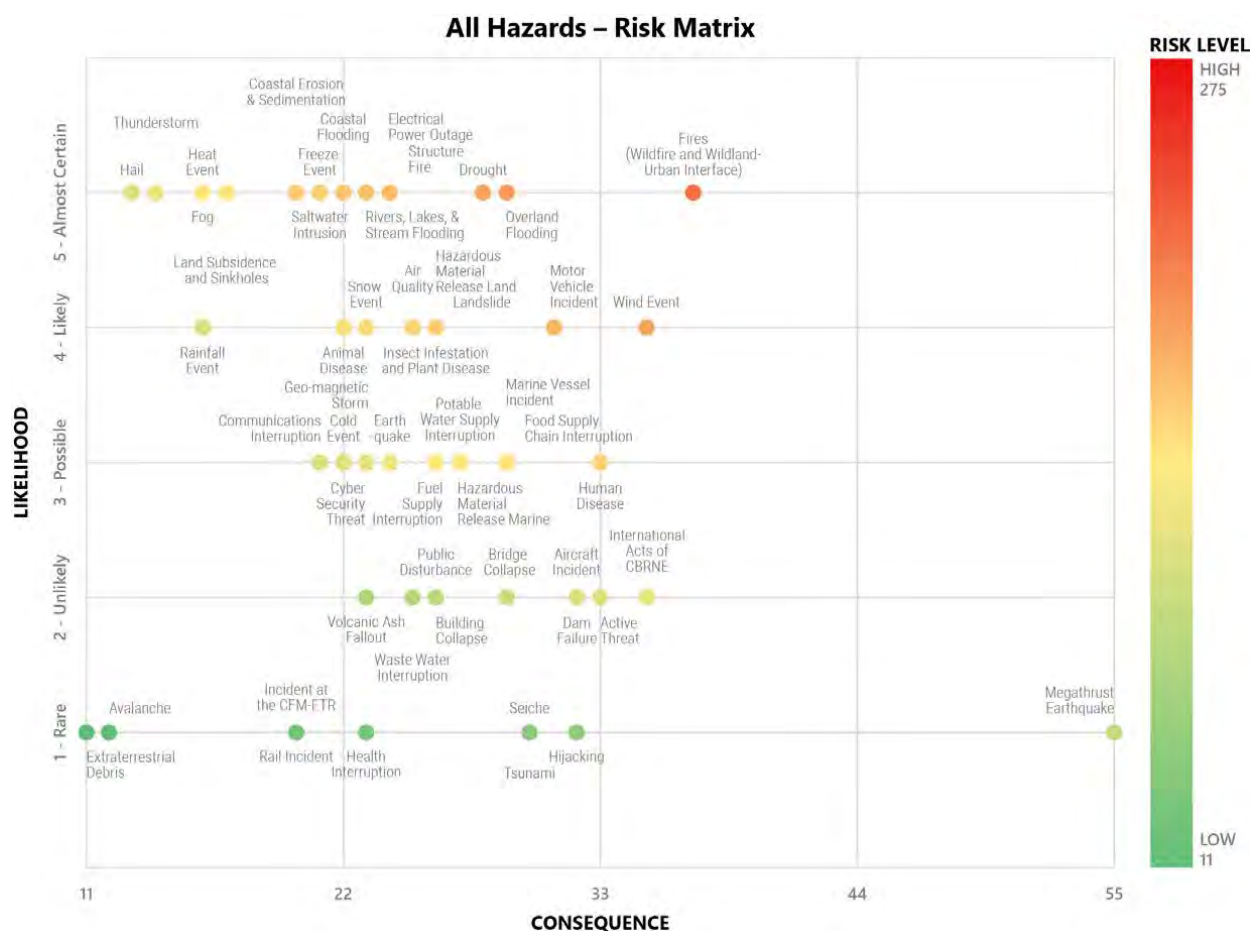
Following the completion of the hazard list, the relative risk posed by each hazard was determined by calculating a risk score. Risk is defined as “as a measure of the probability [likelihood] and severity of an adverse effect to health, property, the environment, or other things of value” (EMBC, 2004). To calculate the risk scores, it was necessary to assess both the likelihood of each hazard’s occurrence and its potential consequences.

Each hazard was assigned a likelihood score of 1 to 5 and a consequence score of 11 to 55 (the consequence score is a sum of values from 11 different consequence categories, each with a possible score of 1 to 5). Using the common approach of multiplying likelihood by consequence to arrive at a measure of risk, each hazard was assigned a risk score between 11 and 275.

FINDINGS

Hazard Assessment Results & Risk Scores

The likelihood and consequence scores for each hazard were plotted on a risk matrix to provide a clear, visual representation of the risks across all hazards (see figure below).



A comparison of risk scores across all hazard categories (natural, technological, and conflict-related), revealed that natural hazards pose the greatest risk to the region. Natural hazards (Wildfire and Urban Interface Fire, Overland Flooding, Wind Event, and Drought) account for four out of the five highest rated hazards. The natural hazard category also accounts for the most likely hazards for the region, as well as many of those with the highest consequence. The

Megathrust Earthquake hazard, while low on the likelihood scale, has the highest overall consequence score (55) of all the hazards.

Of the technological hazards, Motor Vehicle Incident has the highest risk score, followed closely by Electrical Power Outage and Structure Fire. While several of the conflict hazards were found to have high overall consequence scores, e.g. Intentional Acts of CBRNE¹, Active Threat, Hijacking, these hazards scored relatively low on the likelihood scale and received lower risk scores as a result.

Due to the multiplication factor involved in calculating the overall risk score, the hazards with the highest overall risk score tended to be those which had higher likelihoods. Several hazards were determined to have a very high consequence rating, but a low likelihood rating, which meant they fell lower in the risk table. As such, when determining the "Top Hazards" for the region, a filter was applied to capture those high consequence/low likelihood hazards, in addition to the hazards with high overall risk scores. A total of 13 "Top Hazards" were identified for the region:

Hazard	Likelihood (1-5)	Overall Consequence (11-55)	Risk Score
Fires (Wildfire and Urban Interface)	5	37	185
Overland Flooding	5	29	145
Wind Event	4	35	140
Drought	5	28	140
Motor Vehicle Incident	4	31	124
Electrical Power Outage	5	24	120
Structure Fire	5	24	120
Rivers, Lakes, and Stream Flooding	5	23	115
Coastal Flooding	5	22	110
Human Disease	3	33	99
Intentional Acts of CBRNE	2	35	70
Active Threat	2	33	66
Megathrust Earthquake	1	55	55

Vulnerability and Resiliency

The HRVA also details areas of vulnerability as well as the strength and resiliency of the region. While being situated in a hazardous zone is a key determinant of risk, a community's

¹ A chemical, biological, radiological, nuclear, and explosives (CBRNE) event.

vulnerability defines the susceptibility of the people, property, industry, resources, and the environment to harm should a hazard event occur. Vulnerabilities were grouped into four sections within the report:

- Social Vulnerabilities (e.g. age, language, income levels);
- Economic Vulnerabilities (e.g. economic dependencies on industries and resources);
- Environmental Vulnerabilities (e.g. dependencies on sensitive natural areas); and
- Physical Vulnerabilities (e.g. critical infrastructure, locally owned assets).

HRVA engagement session participants identified various physical, social, and structural barriers to accessing services and supports encountered by vulnerable populations (e.g. elderly, homeless, and low-income families) in the region. Limited financial resources, inadequate housing or living conditions, and dependency on support services reduce the adaptive capacity and resilience of these populations.

The region has a relatively high percentage of elderly residents (27% of the population is age 65 or over) and the population is aging. Seniors are particularly vulnerable to the health impacts associated with natural hazards. Older adults are also more vulnerable to service disruptions which may follow hazard events such as wind storms and power outages.

With many tourists visiting the local destinations in the summer months, and the addition of those using the region as a thoroughfare to reach other destinations, there may also be a significant non-resident population at any one time that is potentially vulnerable to hazard events.

Just as social systems play a key role in human vulnerability to hazards, social systems also underpin many aspects of community resilience. The sense of community, or feelings of belonging, has been identified as an important component of a community's ability to "bounce back". The sense of connectedness and strong support networks in the region were highlighted by engagement session participants as an important aspect of the region's resiliency.

Climate Change

Canada's climate is currently warming at a rate nearly twice that of the global average. Projections suggest that by the years 2081 to 2100, Canada's climate will increase by 1.8°C if emissions are reduced, or up to 6.3°C if emissions remain high.

While climate change is a global phenomenon, a variety of factors determine how the impacts of climate change manifest at the local level. With projected population growth in the region estimated at 12% over the next decade, increased development and transition from a rural to more urban environment is anticipated. The impacts of urbanization and other land cover changes, and their compounding effects on climate change, should be considered when determining adaptation and mitigation strategies for the future.

Climate change is likely to affect the majority of hazards faced by the region. According to the BC Ministry of Environment and Climate Change, “the likelihood of most risk events increases over time based on projections of future climate change”. A strong majority of engagement session participants agreed that climate change would have an impact on the occurrence or severity of most natural hazards.

The hazards anticipated to be most heavily impacted by climate change, leading to an increase in frequency and/or severity, include:

- Wildfire
- Flooding (Surface Water, Rivers, Lakes and Streams and Coastal)
- Wind Event
- Drought
- Salt Water Intrusion
- Heat Event
- Rainfall Event

The region is currently working on various initiatives to plan and prepare for the impacts of climate change. Recent initiatives include the Adaptation Changemakers Qualicum Beach climate change project and the RDN Coastal Floodplain Mapping project. As the local impacts of climate change transpire, and new information becomes available, the results of this hazard assessment should be re-evaluated, and the prioritization of associated mitigation and adaptation strategies reconsidered.

CONCLUSION

This HRVA is a foundational step towards enhancing regional resilience. Through the calculation and plotting of risk, the HRVA has provided local community members, stakeholders, and decision-makers with a view of the risks across all hazards. The findings can serve as a useful tool in promoting robust discussions, determining unacceptable levels of risk, and arriving at highest priority hazards for risk management, resiliency building, and emergency preparedness activities.

The results of the assessment reveal that natural hazards pose the greatest risk to the region, and that the risk from most hazards locally is increasing, due to climate change and urbanization.

Through the efforts of the Production Team and the engagement session participants, the region has an assessment that can be confidently used in risk-based decision making, the setting of priorities for proactive hazard mitigation, and in developing an action plan towards becoming a disaster resilient community.

01 Introduction

PURPOSE

The purpose of a Hazard, Risk and Vulnerability Analysis (HRVA) is to “help community leaders make risk-based choices to address vulnerabilities, mitigate hazards, and prepare for response and recovery from emergencies” (EMBC, 2004). The HRVA provides a comparison of risks that may exist within a community across the full spectrum of hazards, categorized into natural, technological, and conflict-related hazards. This approach enhances the understanding of the relative risks posed to the community by each hazard, as well as enables the community to prioritize risk management and emergency preparedness activities in relation to those hazards that pose the greatest risk.

When conducting an HRVA, it is important to not only consider the hazard, but its frequency or likelihood and its consequence. Even though a hazard may be highly likely to occur, its consequences may be minimal. Similarly, a hazard event that is unlikely to occur may have severe consequences. To fully assess the consequences of a hazard event, significant consideration of the various vulnerabilities a community might have to that hazard is required.

Risk assessments, such as HRVAs, are a requirement of the *Local Authority Emergency Management Regulation*. Section 2(1) of the regulation states:

A local authority must reflect in the local emergency plan prepared by it under section 6 (2) of the Act:

(a) the potential emergencies and disasters that could affect all or any part of the jurisdictional area for which the local authority has responsibility, and

(b) the local authority's assessment of the relative risk of occurrence and the potential impact on people and property of the emergencies or disasters referred to under paragraph (a) (Government of British Columbia, 2019).

This HRVA will be used as a foundation for the next phase of the region’s emergency preparedness and mitigation activities. The report be used to support the improvement of emergency plans, the enhancement of community and responder education, and the expansion of training programs. The HRVA will also act as a source document – detailing areas of vulnerability as well as the strength and resiliency of the region – leading to the development and prioritization of mitigation strategies for hazard management, with a focus on hazards that are likely to occur or will have the greatest impact. With projected increases in the frequency and severity of many hazards due to climate change and urbanization, this HRVA also aims to inform local decision-makers when determining adaptation strategies for the future.

Previous Works

An HRVA for the Regional District was completed in 2006, with an update to the assessment completed in 2009. In 2009, the City of Parksville and District of Lantzville undertook individual HRVAs for their communities as well.

SCOPE

This HRVA considered and assessed those hazards which present a risk to the region overall inclusive of the Town of Qualicum Beach, City of Parksville, and District of Lantzville; Regional District of Nanaimo Electoral Areas A, B, C, E, F, G, and H; and the region's three First Nations communities: Qualicum, Snaw-naw-as (Nanoose), and Snuneymuxw First Nations.

The assessment was inclusive of natural, technological, and conflict-related hazards.

Out of Scope

This HRVA explored the level of risk and potential impacts of specific hazards to the region overall and did not assess the risk or specific impacts to individual communities. The risk scores presented in the assessment are applicable to the [region](#) and may not reflect the specific risk to an individual community.

The assessment of the hazard applicability, impacts, vulnerability, and resiliency factors for the City of Nanaimo was considered out of scope of this HRVA.

The depth of assessment of vulnerabilities did not allow for gathering of data specific to school attendance by geographic areas, the proximity of residents' work to their homes, or dependencies on large, single employers. Additionally, the analysis of building types and specific locations of critical infrastructure was out of scope for this assessment.

The scope of the project focused on identifying locally owned critical assets; identification of regional critical infrastructure in all ten sectors was considered out of scope. Local government owned assets, including response services such as Emergency Support Services and Fire Departments, were not analyzed for accessibility or availability. Exploration of mitigation, preparedness, and capacity of critical infrastructure was limited.

The consequences of the identified hazards were assessed through the consideration of individual hazard events. An assessment of the impacts of simultaneous or cascading hazard events was determined to be out of scope.

LIMITATIONS

Data Sources & Approach

The approach and tools used in this assessment align with the standard practices set out in Emergency Management British Columbia's (EMBC) Hazard Risk Vulnerability Analysis Toolkit (2019). The toolkit promotes the exploration and incorporation of both scientific data and local knowledge during the hazard assessment process. Following this approach, hazard assessments were conducted using a combination of observational data and background research cross-referenced against insights from local experts and community members.

The assessment of risk was completed with information available at the time the HRVA was conducted. Extensive research and information gathering efforts were undertaken to source the most current and relevant information, and efforts were made to engage subject matter experts and community members for input. Access to this local information and expertise was limited by attendance and participation levels at the engagement sessions. If individuals or organizations were not able or chose not to attend, the project team was limited in their ability to gather information from these sources to inform the assessment.

The use of anecdotal evidence in the assessment of hazard likelihood adds an additional layer of subjectivity to an inherently subjective process. Risk assessments rely on judgement to arrive at measures of likelihood and consequence, which inevitably introduces subjectivity and bias. The interpretation of a hazard description and the subsequent assessment of its likelihood and consequence are influenced by an analyst's professional expertise, individual experiences, responsibilities, and perspectives.

This assessment was undertaken by a diverse team who worked together to arrive at qualitative measures of likelihood and consequence by consensus. While each team member brought a wealth of experience and a unique outlook, repeating the assessment with a different group of people may lead to differences in the results. The risk ratings that resulted from this process should be interpreted as best estimates and not absolutes. As stated in the HRVA Toolkit (2019), "the value of the HRVA is just as much in the conversations that take place amongst a diversity of people and groups as it is in the final results".

Hazard Identification

A great deal of effort was invested in identifying a list of hazards that could impact the region. The definitions for each hazard were reviewed and edited for clarity and to ensure relevance to the region. While every attempt was made to arrive at a comprehensive, tailored list of hazards for the region, other, unidentified hazards may exist.

Regional Perspective

This HRVA was undertaken to provide an assessment of the hazards that may present risks to the region as a whole. The hazard assessment process was conducted at the region level and

does not present a specific rating of likelihood or consequence for individual communities within the region. Efforts have been made to synthesize the available information and data and present summaries applicable to the region overall. Though the assessment was conducted with the perspective of the region as a whole, not all parts of the region will be equally at risk to each of the hazards. The results of this assessment serve as a starting point for additional efforts to tailor the hazard, risk, and vulnerability information for individual communities.

APPROACH

02 Engagement

A key component of the assessment was community engagement. A series of three engagement workshops were conducted to facilitate the sharing of traditional knowledge, personal perceptions, and local understanding of hazards, risks, and vulnerabilities within the region. The intention of the engagement was to determine perceptions of the community's vulnerabilities and resiliency strategies, while strengthening relationships and building a shared understanding of risks posed to the community as a method to contribute to long-term resiliency.

The workshops were organized and strategically facilitated to emphasize and encourage an open dialogue with all attendees, and to allow for both individual and group contributions. Each session focused on a specific component of the HRVA process and included activities to engage participants, meet workshop objectives, and gather input and feedback on identified project elements. In addition to the engagement sessions, outreach to interview specific individuals was conducted to obtain more technical or scientific information related to probabilities and historical instances of hazard events.

The engagement participants included representatives from government and non-government agencies, first responders, Indigenous community members, industry stakeholders, neighbouring community members, and subject matter experts. Two geographic groups, "North" and "South", were created for the engagement sessions. Separating the groups into North and South enhanced participation and aided engagement efficiency and focus allowing time to adequately explain processes and capture input into multiple elements per session. In addition, separating the groups into North and South highlighted the geographic, economic, demographic, and perceived differences between the two areas. Each session group was made up of identified key area representatives who utilized their expertise, local knowledge, and geographic familiarity, to provide input and contribute to the activities and assessments. The complete list of entities who participated is included in [Appendix 6](#) of this document.

The first engagement sessions were held on October 10, 2018 (Day One – North) in Qualicum Beach and October 11, 2018 (Day Two – South) in Nanaimo. There was a total of 66 participants in attendance at the two sessions. The objectives of the initial engagement session were to:

- Discuss hazard perceptions and historical experiences to assist in determining the list of applicable hazards for the Region.
- Explore the perceptions of risk, focusing on the frequency and severity of hazards.
- Discuss the preliminary critical asset list; understand perceptions of the impacts associated with the loss of those critical assets; and identify specific examples of additional local and community critical assets.

Participants were invited back for a second round of engagement on February 20, 2019 (Day One – South) in Nanaimo and February 21, 2019 (Day Two – North) in Qualicum Beach. There

was a total of 56 participants in attendance; many of whom had attended the initial session. The objectives of the second engagement session were to:

- Highlight community perceptions of the consequences of hazard events.
- Explore physical conditions and resource accessibility issues that could contribute to local community vulnerabilities.
- Identify current and future strategies for strengthening community resiliency.

The final engagement session, held June 12, 2019 in Parksville, united the North and South groups into a single session. Having all attendees together allowed for the presentation of the findings of the hazard assessment for the region, and the subsequent dialogue to be inclusive to all the participants concurrently and with a united, regional perspective. Forty-four (44) people attended the final session; 70% of whom had been to at least one of the previous engagement workshops.

Results and information gathered during the engagement sessions provided context and background, including community and entity perceptions, which made it possible to conduct the assessment from the true perspective of the region. Information received from participants about historical events helped to inform discussions related to hazard likelihood and local relevance. Perceptions shared regarding the significance of the various hazard consequences were used to inform the evaluation of impacts per hazard, specific to the region.

"The sessions were open, informative and I felt we were heard and the information we bring is valuable" (Engagement Session Participant).

Feedback from participants suggested the benefits of the engagement session included:

- An opportunity to contribute to the identification and prioritization of hazards;
- An improved understanding of risks to the community;
- An understanding of how the HRVA will serve as a foundational tool to inform regional planning projects; and
- An opportunity to strengthen connectivity between organizations and communities.

94% of attendees either **agreed or strongly agreed** that they found the engagement process informative and provided an opportunity for learning and contribution of local knowledge.

03 Hazard Identification & Assessment

HAZARD IDENTIFICATION

The first step in the hazard assessment process was to identify the hazards that could affect the region. A comprehensive list of natural and human-caused hazards was created by surveying a variety of emergency management and risk reduction standards, frameworks, and tools including provincial (EMBC), federal (Public Safety Canada) and international hazard lists. This working list was then refined to capture hazards relevant to the region determined through the review of historical data, previous HRVAs, and engagement of community members and subject matter experts (SMEs). The project team ultimately identified 53 hazards that could affect the region. The hazards were then categorized into “natural”, “technological”, and “conflict” related hazards. The full list of hazards and their definitions can be found in [Appendix 2](#).

RISK ASSESSMENT

Following the completion of the hazard list, the next step was to determine the relative risk posed by each hazard by calculating a risk score. Risk is defined as “as a measure of the probability [likelihood] and severity of an adverse effect to health, property, the environment, or other things of value” (EMBC, 2004). To calculate the risk scores, it was necessary to assess both the likelihood of each hazard’s occurrence and its potential consequences. The assessment was grounded in engagement with stakeholders, community leaders, and subject matter experts, supplemented with research into historical and notable hazard events, and the consideration of influencing factors, particularly climate change.

Risk is commonly calculated by multiplying the likelihood score by the total consequence score, as follows:

$$\text{Risk} = \text{Likelihood} \times \text{Consequence}$$

Likelihood Assessment

Likelihood is the probability of an event occurring and is commonly expressed as an expected rate of occurrence e.g. once every 15 years. Estimated rates of occurrence were obtained using published and historical records of notable incidents for the region, wider province, and country. Hazard likelihood information from previous risk assessments and reports relevant to the region was also considered.

Following the collection and review of hazard frequency data, the project team assigned a likelihood rating to each hazard. The likelihood rating was based on a 5-point scale (see [Table 1](#)) which is a combination of the scale provided in the EMBC HRVA Toolkit (2019) and the scale

provided by the UN International Strategy for Disaster Reduction Resilient Cities' Quick Risk Estimation Tool. The likelihood assessment used a combined scale to permit the use of historical data when no frequency data or return period information was available.

Table 1 – Likelihood Scale

EMBC				UNISDR
Likelihood	Rating	Frequency	Probability (% Chance)	Historical Data (Definition/Consideration)
Almost certain	5	Event is expected to happen once every two years or more frequently	Annual chance $\geq 50\%$	Has occurred 3 or more times in the last 5 years
Likely	4	Event is expected to happen about once every 3-10 years	$10\% \leq$ annual chance $< 50\%$	Has occurred twice in the last 5 years
Possible	3	Event is expected to happen about once every 11-50 years	$2\% \leq$ annual chance $< 10\%$	Has occurred once in the last 5 years
Unlikely	2	Event is expected to happen about once every 51-100 years	$1\% \leq$ annual chance $< 2\%$	May occur and has occurred once in the last 10 years
Rare	1	Event is expected to happen less than once every 100 years	Annual chance $< 1\%$	May only occur in exceptional circumstances and has occurred in the last 20 years

Consequence Assessment

Consequences are the physical/environmental, social, economic, and political impacts or adverse effects that may occur as the result of a hazardous event (EMBC, 2019). Understanding the potential impacts of a hazard is a key step in assessing risks to a community. Any one hazard can have a variety of impacts and these impacts can differ in severity.

To support the measurement of consequences for a hazard event, EMBC has identified 11 consequence categories, divided into "Human and Social Impacts" and "Physical and Economic Impacts", and has provided defined impact rating scales for each category.

Human and Social Impacts:

- Fatalities
- Injury/Illness
- Displacement
- Psychosocial
- Support System Impact
- Cultural Resource Impact

Physical and Economic Impacts:

- Property Damage
- Critical Infrastructure
- Environmental
- Economic
- Reputational

The project team rated the severity of potential impacts for each hazard using the 5-point scale associated with each consequence category (see [Table 2](#) and [Table 3](#)). Current risk treatments and/or mitigation activities were considered when the project team rated the impacts of the various hazards.

The 11 consequence scores were summed to give a total consequence score out of 55 for each hazard.

Table 2 – Consequence Rating Scale (Human and Social Impacts)

Rating	Fatalities	Injury/Illness	Displacement	Psychosocial	Support System Impact	Cultural Resource Impact
1	Not likely to result in fatalities.	Not likely to result in injuries or illness.	Not likely to result in evacuation orders.	Event is unlikely to result in any short- or long term trauma.	Not likely to impact access to supports or networks. Community reciprocity, trust and cooperation are unaffected.	Little to no impact.
2 LOW	Loss of life that is manageable within the scope of normal operations.	Illness or injury that is manageable within the scope of normal operations.	Low percentage of the population evacuated, self-evacuated or sheltering in place. Supports are provided within the community.	Direct impacts to a few individuals. Psychosocial impacts can be primarily addressed by Psychological First Aid. Additional supports to those directly impacted and their families can be provided by local mental health professionals.	Hours-day-long disruption to daily life. Likely to result in some localized reduced access to supports/networks. Community reciprocity, trust, and cooperation are affected.	Recovery of the resource will take days to weeks.
3 MED	Loss of life that is beyond the scope of normal operations and may require overtime and/or additional resources.	Illness or injury that is beyond the scope of normal operations and may require additional capacity and/or resources, and/or the activation of response systems and emergency plans.	Enough of the population is evacuated, self-evacuated or sheltering in place to require external support.	Localized loss of property and/or fatalities or serious injuries. Those directly impacted are likely to experience both short- and long-term psychosocial impacts. Local and outside mental health professionals will be needed to provide support and treatment.	Days-long disruption to daily life. Likely to result in reduced access to supports or networks. Community reciprocity, trust, and cooperation are affected.	Recovery of the resource will take months.
4 HIGH	Loss of life severe enough for mass fatality procedures to be activated.	Extensive mass illness or injury requiring extra capacity and/or resources across multiple facilities in a health region and potentially specialized care from other health regions. Health authority response systems and emergency plans activated.	10-30 percent of the population evacuated or displaced.	Widespread loss of property and/or multiple fatalities or persons with serious injuries. Those directly impacted are likely to experience both short- and long-term psychosocial impacts. Local and outside mental health professionals will be needed to provide support and treatment.	Weeks or Months-long disruption to daily life. Significantly reduced access to supports or networks. Community reciprocity, trust, and cooperation are severely affected.	Recovery of the resource will take years.
5 EXTREME	Fatalities exceed capacity of existing plans and capabilities. Provincial, Federal and International resources may be required.	Extraordinary mass illness or injury. Provincial, Federal or international resources may be required. Multiple health region response systems are active.	High percentage of residents are displaced for years or permanently.	Widespread and long-term psychosocial impacts beyond those who are directly affected by property loss or fatalities. Extensive external supports required.	Months to years-long disruption to daily life. Supports or networks may be permanently changed.	Resource can never recover; destruction is permanent and irreversible (e.g., destruction of an irreplaceable artifact/knowledge).

Table 3 – Consequence Rating Scale (Physical and Economic Impacts)

Rating	Property Damage	Critical Infrastructure	Environmental	Economic	Reputational
1	Not likely to result in property damage.	Not likely to disrupt critical infrastructure services.	Not likely to result in environmental damage.	Not likely to disrupt business or financial activities.	Not likely to result in political or reputational impacts.
2 LOW	Minor, mostly non-structural damage.	Low percentage of the population impacted by few service disruptions. Disruptions last hours to days.	Localized and reversible damage. Hours to days-long clean up possible.	Days-long disruption to few businesses, financial activities, or livelihoods.	Limited or short-term political or reputational impacts.
3 MED	Localized severe damage.	Either a high percentage the population impacted by a few services OR a low percentage of the population impacted by a major or multiple service disruptions.	Full clean up possible but may take weeks.	Weeks-long losses to businesses, industry or livelihoods.	Some significant or long-term political or reputational impacts.
4 HIGH	Widespread structural damage.	High percentage of the population impacted by a major or multiple service disruptions.	Major but reversible damage. Full clean up difficult and could take months or years.	Months long losses to business, industry or livelihoods.	Significant and long term political or reputational impacts.
5 EXTREME	Widespread irreparable damage.	High percentage of the population is impacted by long-term outages.	Severe or irreversible damage. Full clean up not possible or could take decades.	Widespread or long-term loss of businesses, industry or livelihoods.	Significant and irreparable political or reputational impacts.

HRVA Findings

04 Community Profiles

GEOGRAPHIC SETTING

Situated on the central east coast of Vancouver Island, the Regional District of Nanaimo (“the region”) covers a large, geographically diverse area of over 2,000 square kilometers. Bound by the Strait of Georgia to the east, the region is bordered by Comox Valley Regional District to the north, Alberni-Clayoquot Regional District to the west, and Cowichan Valley Regional District to the south (see [Figure 1](#)). There are four municipalities within the region – the Town of Qualicum Beach, City of Parksville, the District of Lantzville, and the City of Nanaimo, and seven unincorporated Electoral Areas. The Regional District of Nanaimo provides both regional governance and a variety of regional and local services to its constituent communities.

The electoral areas within the region are as follows:

- Electoral Area A: Cedar, South Wellington, Yellowpoint, Cassidy
- Electoral Area B: Gabriola, Decourcy, Mudge Islands
- Electoral Area C: Extension, Nanaimo Lakes, East Wellington, Pleasant Valley
- Electoral Area E: Nanoose Bay
- Electoral Area F: Coombs, Hilliers, Errington, Whiskey Creek, Meadowood
- Electoral Area G: French Creek, San Pareil, Little Qualicum
- Electoral Area H: Bowser, Qualicum Bay, Deep Bay

The Regional District of Nanaimo is situated within the traditional territory of several First Nations, including three that have communities and other lands under their jurisdiction: Snuneymuxw, Snaw-Naw-As (Nanoose), and Qualicum First Nation (Regional District of Nanaimo, 2013).

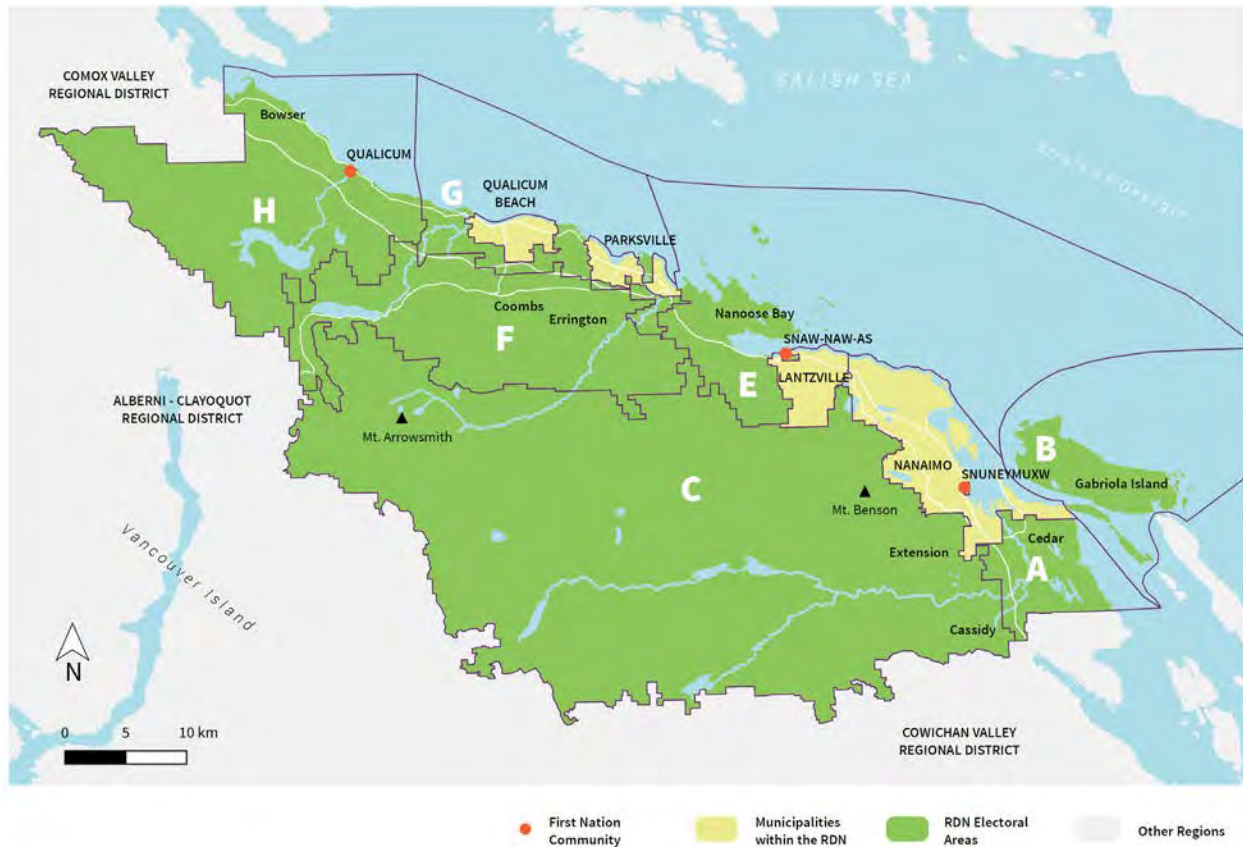


Figure 1 – Map of the Regional District of Nanaimo

Source: Regional District of Nanaimo, 2019

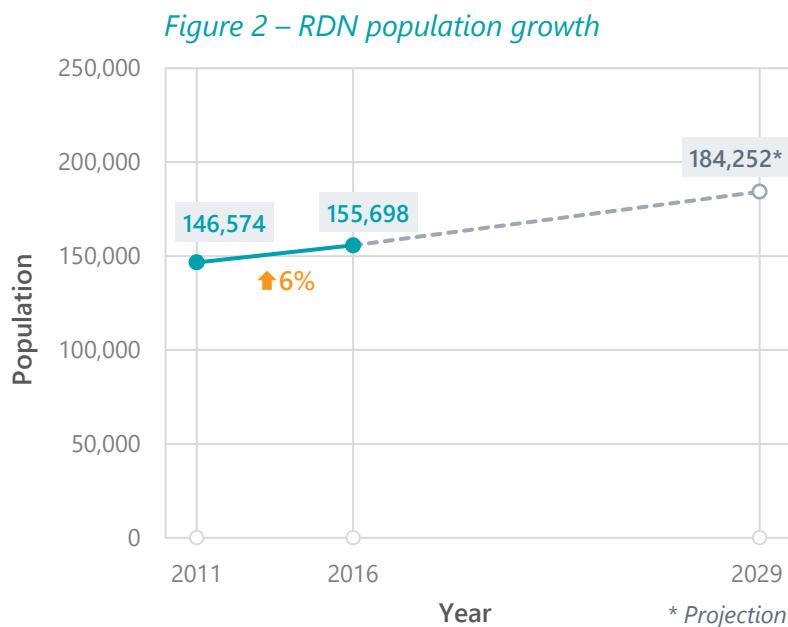
Situated between the mountains and the ocean on the east side of Vancouver Island, the Regional District of Nanaimo encompasses a wide diversity of landscapes and ecosystems. The terrain ranges from steep forested headlands in the west (the highest point, Mount Arrowsmith ridge, is 1818 m above sea level) to gently undulating lowlands in the east where the region's watersheds discharge into the Georgia Strait.

The region has a moderate coastal climate with warm dry summers (average daily high of 21°C) and mild, wet winters (average daily low of 10° C). As the region is located on the leeward side of Vancouver Island's mountain ranges, the rain shadow effect causes this region to experience a climate similar to the Mediterranean. There are two biogeoclimatic zones within the region: the Coastal Douglas Fir moist maritime zone (CDFmm), and the Coastal Western Hemlock very-dry maritime zone (CWHxm). The Coastal Douglas Fir biogeoclimatic zone dominates the portion adjacent to the coast and is the smallest and most at-risk zone in BC (CDFCP, 2018).

Most of the region's population lives and works within the lowland regions. Productive agricultural lands are found in the middle watersheds, and the majority of the upland regions are private forest land with active logging operations.

GENERAL DEMOGRAPHICS

With more than 160,000 people calling the Regional District of Nanaimo home, it is British Columbia's fifth most populous regional district (Statistics Canada, 2016). Between 2011 and 2016, the population of the region grew by 6% (see [Figure 2](#)). Current estimates suggest that the population will grow by another 12% over the next decade, from an estimated 164,546 residents in 2019 to 184,252 residents in 2029 (Stats BC, 2018).



Source: 2011 and 2016 data – Statistics Canada, 2016
2019 population estimate – Stats BC, 2018

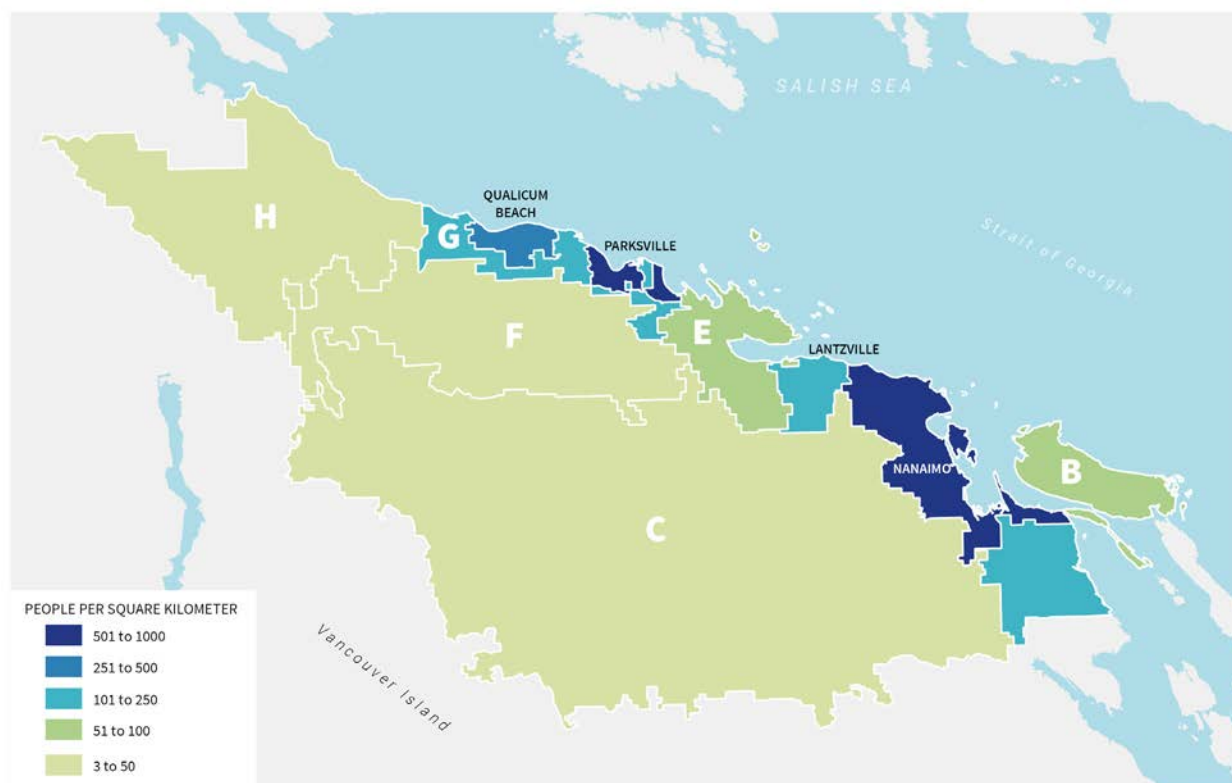


Figure 3 – Population density by municipality and electoral area

The density of settlements is highly varied across the region with a mixture of high-density urban areas, moderate density urban and suburban areas, and swathes of sparsely populated rural areas. The population density of the member municipalities and unincorporated rural electoral areas ranges from a high of 859.6 persons per km² in the City of Parksville to just 2.6 persons per km² in Electoral Area C (see [Figure 3](#) and [Table 4](#)) (Statistics Canada, 2016).

The First Nations reserves in the region all have a relatively small land base (see [Table 4](#)). The largest of the reserves is the Snuneymuxw “Nanaimo River” reserve, which is 2.24 km² (see [Table 4](#)). Although the on-reserve populations are small compared to those of the neighbouring municipalities and electoral areas, the population density of each reserve is relatively high. The Nanaimo Town 1 reserve has the highest population density in the region at 1,783.1 persons per km².

Table 4 – Population statistics for communities within the RDN

Community	Census 2016 Population	Land Area (km ²)	Population Density (people per km ²)
Parksville	12,514	14.56	859.6
Qualicum Beach	8,943	17.98	497.4
Electoral Area F	7,724	264.36	29.2
Electoral Area G	7,465	49.32	151.4
Electoral Area A	7,058	60.31	117
Electoral Area E	6,125	75.08	81.6
Electoral Area B	4,033	57.76	69.8
Electoral Area H	3,884	277.41	14
Lantzville	3,605	27.68	130.2
Electoral Area C	2,808	1,098.94	2.6
Nanaimo River*	371	2.24	165.7
Nanaimo Town 1†	360	0.2	1,783.1
Nanoose‡	230	0.71	326
Qualicum§	74	0.74	99.4

* Snuneymuxw First Nation Reserve Land

† Snuneymuxw First Nation Reserve Land

‡ Snaw-Naw-As (Nanoose) First Nation Reserve Land

§ Qualicum First Nation Reserve Land

Source: Statistics Canada, 2016

AGE

There is a greater proportion of seniors (age ≥ 65 years) in the region compared to the province (see [Table 5](#)). Over a quarter (27%) of the population in the region is age 65 or over, compared to 18% of the population of British Columbia (Statistics Canada, 2016). The Town of Qualicum Beach and the City of Parksville have the greatest proportion of seniors at 52% and 42% of the population, respectively. In 2016, the median age in the region was 51.1 years, compared to a median age of 43.0 years in British Columbia. Approximately 13% of the population of the region is 14 years of age or younger.

The populations on the First Nations reserves skew much younger than the populations of the municipalities and electoral areas in the region (see [Table 5](#)). Approximately two-thirds of those living on the Qualicum, Snaw-Naw-As (Nanoose), and Snuneymuxw First Nations reserves are between the ages of 15-64 years, and close to a quarter are under the age of 15.

Table 5 – Age characteristics of communities within the RDN

Community	0 – 14 years		15 – 64 years		65 years+	
British Columbia	691,390	15%	3,107,680	67%	848,985	18%
RDN ²	19,985	13%	93,625	60%	42,090	27%
Parksville	1155	9%	6055	48%	5305	42%
Lantzville	505	14%	2260	63%	840	23%
Qualicum Beach	555	6%	3730	42%	4660	52%
Electoral Area A	965	14%	4680	66%	1410	20%
Electoral Area B	300	7%	2220	55%	1510	37%
Electoral Area C	405	14%	1930	69%	475	17%
Electoral Area E	545	9%	3405	56%	2165	35%
Electoral Area F	1155	15%	5090	66%	1480	19%
Electoral Area G	745	10%	4000	54%	2715	36%
Electoral Area H	370	10%	2275	59%	1235	32%
Nanaimo Town 1	85	24%	235	65%	40	11%
Nanaimo River	85	23%	240	65%	45	12%
Nanoose	60	26%	150	65%	15	7%
Qualicum	15	20%	50	68%	10	14%
	BC		BC		BC	

Source: Statistics Canada, 2016

² RDN aggregate statistics include the City of Nanaimo.

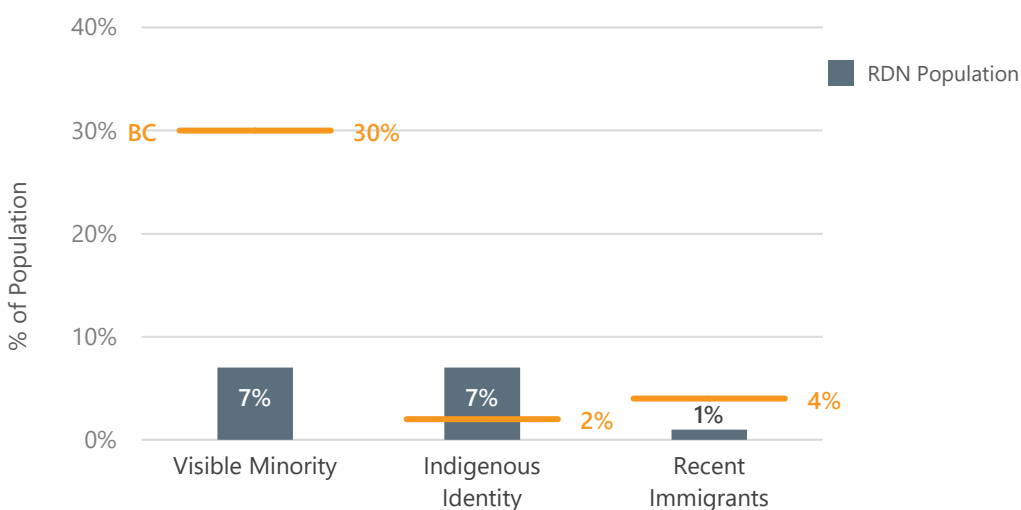
CULTURAL IDENTITY

Approximately 7% (10,855) of people within the region belong to a visible minority³ (see [Figure 4](#)), which is significantly lower than the percentage of British Columbia's population belonging to a visible minority (30%). The percent of visible minorities in the municipalities and electoral areas ranges from 2% (Town of Qualicum Beach) to 7% (District of Lantzville). The visible minority population within the region consist mainly of the following groups: Chinese (2695 people, 1.8%), South Asian (2255 people, 1.5%), Filipino (1290 people, 0.9%), and Southeast Asian (985 people, 0.6%).

A further 7% (10,635 people) of the region's population identify as First Nation, Métis or Inuit, which is higher than the 2% of the population of British Columbia that identifies as Indigenous.

Of the regional district's population, only 1% are considered recent immigrants (arriving between 2011 and 2016), compared to 4% of British Columbia's population.

Figure 4 – Cultural identity statistics for the region Source: Statistics Canada, 2016



LANGUAGE

In 2016, 99% of the population in the regional district could conduct a conversation in English (Statistics Canada, 2016). Only 3% of the population of the region speak a language other than English or French (i.e. a "non-official language") most often at home. In British Columbia, 13% of the population speaks a non-official language most often at home.

³ Visible minority refers to whether a person belongs to a visible minority group as defined by the Employment Equity Act and, if so, the visible minority group to which the person belongs. The Employment Equity Act defines visible minorities as "persons, other than Aboriginal peoples, who are non-Caucasian in race or non-white in colour." (Statistics Canada, 2016)

FAMILY AND HOUSEHOLD CHARACTERISTICS

There were 68,904 occupied private dwellings in the region in 2016 (Statistics Canada, 2016). Almost three-quarters of these households (71%, 48,720 people) have 2 or more persons. Of those aged 15 years or older, 60% (81,785 people) are either married or living in a common law relationship. This is comparable to the marital status of the population in British Columbia (58% of those 15 years or older are either married or living common law).

The proportion of couples with children varies across the region but is less than the provincial statistic (48%) in all municipalities and electoral areas (see [Table 6](#)). A greater proportion of couples on the First Nations reserves have children, ranging from 62% of couples in Nanaimo Town 1 to 83% of couples in Nanoose.

In 2016, there were 6,780 lone parent families in the region (representing 15% of families) (see [Table 6](#)). Of these families, 77% were female-led. Over a quarter of families on the First Nations reserves are lone parent families (46% in Qualicum Reserve).

Table 6 – Household characteristics of communities within the RDN

Community	Total number of census families in private households	Lone-parent families		Total – Couple census families in private households	Couples with children	
		n	%		n	%
British Columbia	1,311,345	197,940	15%	1,113,400	535,610	48%
RDN	46,660	6,780	15%	39,880	13,745	34%
Parksville	3835	515	13%	3325	845	25%
Lantzville	1145	120	10%	1020	435	43%
Qualicum Beach	3025	250	8%	2775	505	18%
Electoral Area A	2240	310	14%	1925	740	38%
Electoral Area B	1320	110	8%	1215	230	19%
Electoral Area C	875	80	9%	795	340	43%
Electoral Area E	2195	135	6%	2065	500	24%
Electoral Area F	2315	350	15%	1965	765	39%
Electoral Area G	2615	215	8%	2400	630	26%
Electoral Area H	1290	100	8%	1185	280	24%
Nanaimo Town 1	100	35	35%	65	40	62%
Nanaimo River	105	30	29%	70	50	71%
Nanoose	65	30	46%	30	25	83%
Qualicum	20	5	25%	15	10	67%
			BC			BC

Source: Statistics Canada, 2016

INCOME

The median total income of households in the regional district was \$62,349 in 2015, which was slightly lower than the 2015 median total income of households in British Columbia (\$69,999) (see [Table 7](#)) (Statistics Canada, 2016). The member municipalities and electoral areas with the lowest median total household incomes were: the City of Parksville (\$55,771), Electoral Area F (\$54,800), Electoral Area H (\$54,323), and Electoral Area B (\$47,795). The lowest 2015 median total household incomes were found in the First Nations Reserves: Nanaimo River (\$46,720), Nanaimo Town 1 (\$42,240), Qualicum (\$38,016), and Nanoose (\$23,328).

Approximately 16% of households in the region are classified as low income (based on the Low-income measure, after tax (LIM-AT)), which is in line with the 16% of households in British Columbia that are classified as low income (see [Table 7](#)). Approximately one-fifth of households in Electoral Area F (22%) and Electoral Area H (20%) are classified as low income. The largest proportion of low-income households were found in Electoral Area B (25%).⁴

Table 7 – Income of households in the region

Community	Median total income of households in 2015 (\$)	Prevalence of low income based on the Low-income measure, after tax (LIM-AT) (%)
Electoral Area C	\$84,173	11%
Lantzville	\$82,871	8%
Electoral Area E	\$79,680	11%
Electoral Area G	\$72,158	11%
Electoral Area A	\$71,680	14%
British Columbia	\$69,995	16%
Qualicum Beach	\$65,692	11%
RDN	\$62,349	16%
Parksville	\$55,771	14%
Electoral Area F	\$54,800	22%
Electoral Area H	\$54,323	20%
Electoral Area B	\$47,795	25%
Nanaimo River	\$46,720	n/a (see note below)
Nanaimo Town 1	\$42,240	n/a
Qualicum	\$38,016	n/a
Nanoose	\$23,32	n/a

Source: Statistics Canada, 2016

⁴ "The low-income concepts are not applied in the territories and in certain areas based on census subdivision type (such as Indian reserves). The existence of substantial in-kind transfers (such as subsidized housing and First Nations band housing) and sizeable barter economies or consumption from own production (such as product from hunting, farming or fishing) could make the interpretation of low-income statistics more difficult in these situations." (Statistics Canada, 2016)

ECONOMY

The region's labour force participation rate⁵ (55.2%) is lower than the BC average (63.9%), but it varies greatly across the individual communities (see [Table 8](#)) (Statistics Canada, 2016). The Town of Qualicum Beach and City of Parksville have the lowest labour force participation rates in the region (35% and 43.4%, respectively), which is likely due to the large proportion of retired persons in these areas.

The unemployment rate for the region (7.7%) is slightly higher than the BC average of 6.7% (see [Table 8](#)). Of the member municipalities and electoral areas, the highest unemployment rates were found in Electoral Area H (11.3%), Electoral Area, B (9.6%), and Electoral Area F (8.5%). The highest unemployment rates in the region were observed in three of the First Nations reserves; Nanoose (23.8%), Nanaimo Town 1 (22.2%), and Nanaimo River (19.2%).

The service sector accounts for most of the economic base within the region with service industries employing 79% of the labour force (Statistics Canada, 2016). Goods-producing industries employ 19% of the labour force. This breakdown mirrors the provincial statistics; service industries employ 80% of the labour force in BC and goods-producing industries employ 19%.

The retail sector and health care sector are the largest employers in the region with each sector providing approximately 10,000 jobs or approximately 14% of all jobs (Statistics Canada, 2016). Construction is another important economic activity in the region, providing employment for approximately 10% of the region's labour force (approximately 7,000 jobs). The tourism industry accounts for 8% of all jobs in the region (approximately 6,000 jobs) and includes accommodation, food services, entertainment and recreation, plus a variety of economic activities that support the industry.

⁵ The labour force is composed of those 15 years of age and older who are either employed or actively seeking work. The labour force participation rate represents the ratio between those in the labour force and the total population that is of working age. (Statistics Canada, 2016)

Table 8 – Labour force and unemployment statistics for communities within the region

Community	Labour force participation rate (%)	Unemployment rate (%)
Qualicum	73%	0%
Electoral Area C	66%	7%
British Columbia	64%	7%
Nanoose	64%	24%
Electoral Area A	62%	8%
Electoral Area F	60%	9%
Lantzville	59%	7%
RDN	55%	8%
Nanaimo Town 1	49%	22%
Electoral Area H	47%	11%
Electoral Area E	47%	7%
Electoral Area B	46%	10%
Electoral Area G	46%	8%
Nanaimo River	46%	19%
Parksville	43%	7%
Qualicum Beach	35%	6%

BC

Source: Statistics Canada, 2016

05 Vulnerability

INTRODUCTION

To fully understand how a hazard might impact a community, it is necessary to consider the degree of vulnerability to the hazard. While being situated in a hazardous zone is a key determinant of risk, a community's vulnerability defines the susceptibility of the people, property, industry, resources, and the environment to harm should a hazard event occur.

The UN Office for Disaster Risk Reduction defines vulnerability as:

The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.

(UN Office for Disaster Risk Reduction, 2017)

The Government of British Columbia defines vulnerability as:

"people, property, infrastructure, industry and resources, or environments that are particularly exposed to adverse impact from a hazard event" (EMBC, 2004, p. 12)

To capture these various factors, vulnerabilities have been grouped into four sections within this report: Social Vulnerabilities (e.g., age, language, income levels); Economic Vulnerabilities (e.g. economic dependencies on industries and resources); Environmental Vulnerabilities (e.g. dependencies on sensitive natural areas); and Physical Vulnerabilities (e.g. critical infrastructure, locally owned assets). Considering how these factors increase a community's susceptibility to the impact of hazards will ultimately permit the prioritization of risks based on where communities are most vulnerable.

SOCIAL VULNERABILITY

The occurrence of similar hazard events in different communities will likely reveal significant variations in consequences due to differing levels of social vulnerability. Social vulnerability refers to the (limited) ability of a population to withstand and recover from the adverse impacts of a hazard event. Heightened levels of social vulnerability typically stem from a combination of economic, social, and political processes which give rise to social and economic inequalities (Perdikaris, 2014; IPCC, 2014). In this sense, social vulnerability can be thought of as "a condition which is constantly being altered, reinforced, or diminished" (Prowse, 2003).

Inequitable distribution of social, cultural and economic resources results in social groups that are more susceptible to the impacts of hazards and in greater need of coping assistance. As part of one of the HRVA engagement workshops, participants were asked to consider local resource limitations which have the potential to contribute to vulnerability within the community. The workshop participants identified several resource limitations encountered by seniors, homeless persons, and people of low social-economic status in the region (see [Table 9](#)).

Many of the physical, social, and structural barriers to accessing services and supports encountered by the elderly, homeless, and low-income individuals, as identified by the workshop participants, are similar in nature. Limited income, inadequate housing or living conditions, and dependency on support services reduce the adaptive capacity and resilience of these populations.

Through the review of data collected from the engagement workshops and available census information (see [Community Profiles](#)), the following vulnerable populations within the region were identified.

Seniors

The region has a relatively high percentage of elderly residents (27% of the population is age 65 or over) and the population is aging. As the baby boomer generation grows older, the number of seniors in the region will increase which is expected to have significant implications for housing, support services, and employment (Regional District of Nanaimo, n.d.-a).

Seniors are particularly vulnerable to the health impacts associated with natural hazards. Extreme heat events, for example, can lead to serious illness and even death in older adults (Health Canada, 2011). The physiological characteristics of seniors can reduce their ability to adapt to heat events (e.g. older adults may be prone to dehydration and overheating due to a reduced thirst sensation, fitness level, and sweating ability). These health impacts can be compounded by their social isolation; visual, cognitive, and hearing impairments; and agility and mobility limitations giving rise to increased levels of vulnerability (Health Canada, 2011).

Older adults are also more vulnerable to service disruptions which may follow hazard events such as wind storms and power outages. With an increased reliance on caregivers, medications, and healthcare services, any interruption to these services can disproportionately impact senior populations.

Table 9 – Resource limitations of local community groups

(Input gathered from engagement session participants)

Resource	Seniors (≥65 years of age)	Homeless	Low SES (Socio-Economic Status)
Housing	- Limited independent living facilities and other types of suitable housing. - Limited home care services available.	- Limited access to warm shelters with sanitation facilities. - No ability to stockpile food, water, fuel etc. for use in an emergency.	Lack of affordable housing. May be housed in unsuitable/unstable accommodation that is vulnerable to hazards.
Income	- May not have savings. - May be on a fixed/low income and reliant on pension cheques or other form of income assistance that could be interrupted.	- Limited access to savings/credit. - May be on a fixed/low income and reliant on income assistance that could be interrupted.	- Limited access to savings/credit. - May be on a fixed/low income and reliant on income assistance that could be interrupted. - Limited ability to stockpile food, water, fuel etc. for use in an emergency.
Employment	May encounter barriers to employment due to age discrimination.	May encounter barriers to employment due to discrimination and/or to lack of a permanent address.	May work in service sector jobs that are susceptible to interruption during emergencies.
Social Supports	- Many seniors live on their own. - May not have anyone to check on them or may become cut-off from supports.	Limited mental health care, social workers, and drug addiction programs.	

Resource	Seniors (≥65 years of age)	Homeless	Low SES (Socio-Economic Status)
Transportation	• May no longer drive and so rely on public transportation which is limited in terms of routes and scheduling. • Use of mobility devices may limit transportation options.	• May not have a vehicle and so rely on public transportation which is limited in terms of routes and scheduling.	• May not have a vehicle and so rely on public transportation which is limited in terms of routes and scheduling.
Technology	• Lack of IT skills may limit access to current information.	• Lack of computer/phone/internet may limit access to current information.	• Lack of computer/phone/internet may limit access to current information.
Other	• Health/physical barriers may prevent the moving and stockpiling of resources for an emergency, e.g. water, wood, fuel, food. • Hearing/sight/physical impairments and health issues may increase dependence on medical resources/services.	• May be experiencing mental health or addiction issues. • Limited access to resources may be due to social stigma.	• Limited access to resources may be due to social stigma.

Children/Youth

The region as a whole does not have a high percentage of children and youth (just 13% of the population is 14 years of age or younger), but close to a quarter of those living on the Qualicum, Snaw-Naw-As (Nanoose), and Snuneymuxw First Nations reserves are under the age of 15. Children are particularly vulnerable when separated from their parents or guardians as they are dependent on their caregivers for access to resources, decision-making, mobility, and emotional support (Sharma, 2016). Young children are also more psychologically and physically vulnerable to the impacts from hazards.

Single-Parent Households

The structure of households has been identified as an important factor in social vulnerability (RAND, 2011). There are approximately 7,000 single parent families in the region, three-quarters of which are female-led households. Single parents are over-represented in precarious jobs and may have limited working hours in order to balance childcare responsibilities (Mitchell & Murray, 2017). As a result, these households may have lower income, lower entitlement to health benefits, and reduced social contacts. Households led by single mothers may be particularly vulnerable due to their limited access to resources that arises from issues of power and privilege, and lower wages (Donner & Rodríguez, 2011).

Low Income Households

Approximately one-fifth of households in the region are low income and the median household income on the local First Nations Reserves was found to be far lower than the provincial statistic (see [Community Profiles – Income](#)). Low income populations are generally more vulnerable to hazard impacts due to both the location and quality of their housing, limited mobility, and lack of insurance and savings (City of Vancouver, 2012). Limited financial resources can reduce the ability of a household to both prepare for, endure, and recover from hazard events.

Indigenous Peoples

Approximately 7% (10,635) of the region's population identify as Aboriginal (of which approximately 60% identify as First Nations, 39% identify as Métis, and <1% identify as Inuk). There is a long history of oppression and marginalization of Indigenous peoples in Canada, which has heightened the vulnerability of these populations. The impacts of colonial policies, residential schooling, inter-generational trauma, and continued racism and social exclusion have led to a greater number of health and socioeconomic inequities (Reading & Wien, 2009). Lower income, inadequate housing and living conditions, and limited access to culturally appropriate support services are just some of the factors that have reduced the adaptive capacity and resiliency of Indigenous populations to hazard events. Displacement and evacuations following a hazard event can exacerbate existing resource inequalities and can also be extremely traumatic for those who were affected by residential schools (Indigenous Corporate Training Inc., 2018).

Homeless

In recent years there has been a significant growth in the region's homeless population. The 2018 Point-in-Time (PIT) homeless count coordinated by the province documented 42 individuals experiencing homelessness between Nanoose Bay and Bowser (BC Housing, Homelessness Services Association of BC, Urban Matters, and BC Non-Profit Housing Association, 2018). This count likely vastly underestimates the numbers of unsheltered homeless individuals, according to the Coalition of the Homeless, as PIT data on unsheltered homeless does not include homeless people sleeping in non-visible locations (i.e. the "hidden homeless") (Weesjes, 2015). Furthermore, it is estimated that "for every person who's homeless in Canada, there are an additional 23 households that are vulnerably housed and at high risk of becoming homeless" (Hwang, 2018).

The lack of access to adequate, secure housing increases an individual's ability to endure and recover from a hazard event. Homeless individuals are particularly vulnerable to the impacts of weather-related hazards due to their increased exposure and limited access to climate-controlled (e.g. air conditioned and heated) spaces.

There is a "clustering of vulnerability factors" in homeless populations, which can in turn result in a greater susceptibility to the adverse impacts of hazards (Settembrino, 2015). Those experiencing homelessness may be facing a number of barriers that limit access to housing including high rents, low income, substance-use disorders, disabilities, mental health issues, trauma, and discrimination. With limited access to resources and increased prevalence of health conditions, many homeless individuals are reliant on social and healthcare services that may be disrupted during a hazard event (Gin, 2018). Homeless individuals may be less likely to evacuate or follow suggested safety precautions during a hazard event due to a lack of information and distrust of messengers (Gin, 2018). Those with negative past experiences of institutional settings (e.g. hospitals, psychiatric facilities, jails, residential schools etc.) may be unwilling to enter into emergency shelters or access resources provided by authorities during disaster response and recovery.

Tourists and Travelers

Vancouver Island is a popular tourist destination receiving 4,430,000 overnight visitors (representing 23% of provincial overnight visitation) in 2014 and \$1.77 billion in associated spending (Destination BC, 2017). The region itself has a number of popular tourist destinations and is also home to several major transportation hubs connecting the Regional District of Nanaimo, Vancouver Island, and the BC Mainland. With a large number of tourists visiting the local destinations in the summer months, and the addition of those using the region as a thoroughfare to reach other destinations, there may be a significant non-resident population at any one time that is potentially vulnerable to hazard events. Non-residents may be unaware of the risks to the region and be unfamiliar with where they should go for information or to seek safety in the event of an emergency. Language barriers, scarce social supports, and limited

access to financial resources (including local currency) can all heighten the vulnerability of tourists to hazard events.

ECONOMIC VULNERABILITY

Economic resiliency drives a community's recovery post-disaster (FEMA, 2013). Therefore, economic vulnerability is a key determinant of a community's ability to withstand and rebound from a hazard event. Single industry communities may be more susceptible to harm than those with diverse economic sectors (Bergstrand, Mayer, & Zhang, 2015). If a community is highly dependent on one major industry or employer, the community may have difficulty in recovering from damages to economic assets (i.e. property damage) and economic flows (i.e. damages to the production of goods and services).

The destruction or damage of business facilities, interruptions to public utilities and transportation networks, and the loss of suppliers following a hazard event can lead to business closures. These business closures can, in turn, lead to job losses, an increase in foreclosed homes, and a decrease in population. There may also be an accompanying decrease in tax revenue and local operating budgets, which can further impact the ability of the local economy to recover from the hazard event.

The region has a fairly diverse economic base with four main economic sectors: 1) retail trade, 2) health care and social assistance, 3) construction, 4) accommodation and food services (see [Community Profiles – Economy](#)). Although the agriculture, forestry, fishing and hunting industry category accounts for only 3% of jobs within the region, these activities are important contributors to the local economy and provide a multitude of related opportunities in the region.

ENVIRONMENTAL VULNERABILITY

The region contains a diversity of valuable, sensitive aquatic and terrestrial ecosystems including, but not limited to: older forests and second-growth forests, riparian thickets, rivers and riverine flats, estuarine vegetation, and a variety of shoreline ecosystems. The value of these ecosystems stems from their ecological, cultural, and social significance. These ecosystems provide essential habitat for many plant and animal species within the region including eagles, osprey, and herons and several red- and blue- listed⁶ species and ecological communities.

⁶ In BC, each species and ecosystem are assigned to the red, blue or yellow list based on the level of concern to their risk of being lost. Red indicates "any species or ecosystem that is at risk of being lost (extirpated, endangered or threatened)"; blue indicates "any species or ecosystem that is of special concern"; and yellow is assigned to those "species or ecosystems at the least risk of being lost" (Government of British Columbia, n.d.-h, para. 4).

Natural ecosystems also provide a variety of services that contribute to human well-being. These services include “*provisioning services* such as food, water, timber, and fiber; *regulating services* that affect climate, floods, disease, wastes, and water quality; and *cultural services* that provide recreational, aesthetic, and spiritual benefits” (Millenium Ecosystem Assessment, 2005).

There are many sensitive ecosystems and natural features that are critical to the long-term health of the region. For example, some groundwater aquifers in the region are highly vulnerable to contamination from surface activities such as the improper use/disposal of hazardous materials. With many residents using groundwater as their main source of drinking water, these populations are vulnerable to disruptions to watershed services that affect the quality and quantity of water. Hazard events that may disrupt the groundwater supply include, but are not limited to hazardous material release, drought, and saltwater intrusion.

While many natural areas are highly susceptible to human activities and the impacts of hazard events, the natural environment can also provide a protective buffering service that reduces the magnitude or impacts of hazard events. For example, wetland and riparian areas reduce flooding through the absorption of flood waters, provide erosion and sedimentation control, and recharge groundwater. Environmental degradation diminishes the buffering capacity of these ecosystems against hazard events, which can, in turn, lead to diminished resiliency and greater hazard impacts.

The natural resources in the region are important to community identity as they have long provided economic opportunities in agriculture, forestry, and fishing while also offering aesthetic value and outdoor recreational opportunities for residents and tourists alike. Many natural areas in the region are also valuable in terms of their historical and cultural significance. For instance, Cathedral Grove is a stand of cherished old-growth forest located in Electoral Area F. This ancient forest is valued for its biodiversity and habitat provision, traditional medicines, and cultural significance. The December 2018 windstorm (see [Wind Event](#)) brought highly destructive winds that resulted in significant losses to the park. The degradation or destruction of the natural areas, such as Cathedral Grove, have the potential to increase the social and economic vulnerability of people that depend on these resources.

PHYSICAL VULNERABILITY

Physical vulnerability is a measure of how damage to the built environment impacts a community's ability to withstand and recover from a hazard event. The built environment encompasses the buildings, facilities, and infrastructure, e.g. transportation, electricity, telecommunication, water supply etc., that provide the flow of services critical for economic vitality and social well-being.

Public Safety Canada defines critical infrastructure (CI) as: "services essential to the health, safety, security or economic well-being of Canadians and the effective functioning of government" (2019b, para. 1). The following ten sectors are considered critical infrastructure in Canada:

- Health;
- Food;
- Finance;
- Water;
- Information and Communication Technology;
- Safety;
- Energy and Utilities;
- Manufacturing;
- Government; and
- Transportation.

The network of infrastructure in a community can be highly complex, with various interdependencies, meaning that impacts to one sector may have cascading effects across other sectors. Forecasting the failure of these complex networks is challenging as weaknesses in the system and feedback loops may be unknown until the system fails. Also, the responsibility for various critical assets and infrastructure is divided between different levels of government and public and private agencies, further adding to the difficulty of preparing for and mitigating against critical infrastructure disruption and damage.

Despite the challenges of planning for disruptions to critical infrastructure, proactive measures are required as disruptions could result in "catastrophic loss of life, adverse economic effects and significant harm to public confidence" (Public Safety Canada, 2019b, para. 1). The continued functioning of critical infrastructure during and after a hazard event is considered to be a key determinant of the severity of consequences and speed of recovery (FEMA, 2013).

Interruptions to Critical Infrastructure as Hazard Events

While disruptions in critical infrastructure are often an impact of a natural hazard, failures in critical infrastructure can also be thought of as hazard events in their own right and are not necessarily preceded by a natural hazard event. An electrical power outage, for example, could follow a wind storm or an act of vandalism, but it could also occur due to a failure in equipment and result in hazardous conditions (see [Top Hazards – Electrical Power Outage](#)).

To help assess the risks posed to the region by critical infrastructure disruption, 10 separate hazard events that specifically address critical infrastructure were included in the hazard assessment (see [Table 10](#) and [Appendix 2 – Hazard Definitions: Infrastructure Failure](#) and [Appendix 2 – Hazard Definitions: Transportation Incident Hazards](#)).

Table 10 – Hazards related to critical infrastructure failure

Critical Infrastructure Category	Hazard
Health	• Health Interruption
Food	• Food Supply Chain Interruption
Water	• Potable Water Supply Interruption • Waste Water Interruption
Information & Communications Technology	• Communications Interruption
Energy & Utilities	• Electrical Power Outage
Transportation	• Aircraft Incident • Marine Vessel Incident • Motor Vehicle Incident • Rail Incident

Two of these infrastructure related hazards, Electrical Power Outage and Motor Vehicle Incident, appear in the list of “Top Hazards” for the region. The full assessment results for these hazard events can be found in the All Scores Table (see [Appendix 3](#)).

Measuring Hazard-Specific Impacts to Critical Infrastructure

The impacts to critical infrastructure from hazard events were also considered during the hazard assessment through the use of the Consequence Rating Scale (see [Table 3](#)). “Critical Infrastructure” is one of the five consequence categories under “Physical and Economic Impacts” and the associated scale considers the level of disruption to critical infrastructure services and the proportion of the population affected. The “Critical Infrastructure” consequence score assigned to each hazard can be found in the All Scores Table (see [Appendix 3](#)).

Identification of Locally Owned Critical Assets and Infrastructure

With the region spanning over 2,000 square kilometers and serving over 160,000 residents, there is a relatively extensive network of critical infrastructure. There are a multitude of critical

infrastructure owners and operators in the region, including federal, provincial, regional, and local governments, as well as public and private agencies. These CI owners and operators have responsibilities, some of which are regulatory requirements, to plan and prepare for emergencies to ensure adequate response procedures and business continuity practices are in place.

The project team worked together to identify *locally owned infrastructure* components that are fundamental to the viability and sustainability of the region. Understanding what local critical infrastructure (CI) and assets might be exposed to hazards is key to understanding how a hazard might impact the community.

Critical infrastructure owned or controlled by outside agencies was “out of scope” for the purposes of this assessment. While efforts were made to connect with external critical infrastructure owners/operators, there was minimal participation from these bodies, limiting the availability of information to inform the understanding and assessment of external critical infrastructure in the region, and external dependencies of the local government owned infrastructure.

With a focus on critical assets owned by the Electoral Areas, the Regional District of Nanaimo, Town of Qualicum Beach, City of Parksville, and District of Lantzville, the project team used the *EMBC Critical Infrastructure Assessment Tool* to explore the internal dependencies of these assets. This assessment tool was developed by Emergency Management British Columbia, in partnership with Defence Research and Development Canada and the Justice Institute of BC. The tool has been designed to assist local authorities in identifying services critical to residents in an emergency, the assets needed to provide those services, and the dependencies between those assets and goods and services (Government of British Columbia, 2016b).

Key terms from the Critical Infrastructure Assessment Tool:

Asset: an item or resource that is under control of the local government. This includes tangible things like equipment, vehicles and trained staff. It can also include intangible things like radio networks and software.

Goods & Services: these are goods or resources and services provided to the community by the local government. This includes goods like drinking water and services like policing.

Dependency: this is the term used when goods and services cannot be delivered without a specific asset. For example, providing fire and rescue service as a service is dependent on fire engines and equipment, which are assets.

The assessment tool encourages the classification of relationships between services and assets as either “Critical” or “Important”. Goods or services that must have a specific asset to which there are no alternatives are classified as “Critical”, and goods or services that need a specific asset for which there are alternatives are classed as “Important”. In reviewing the relationships

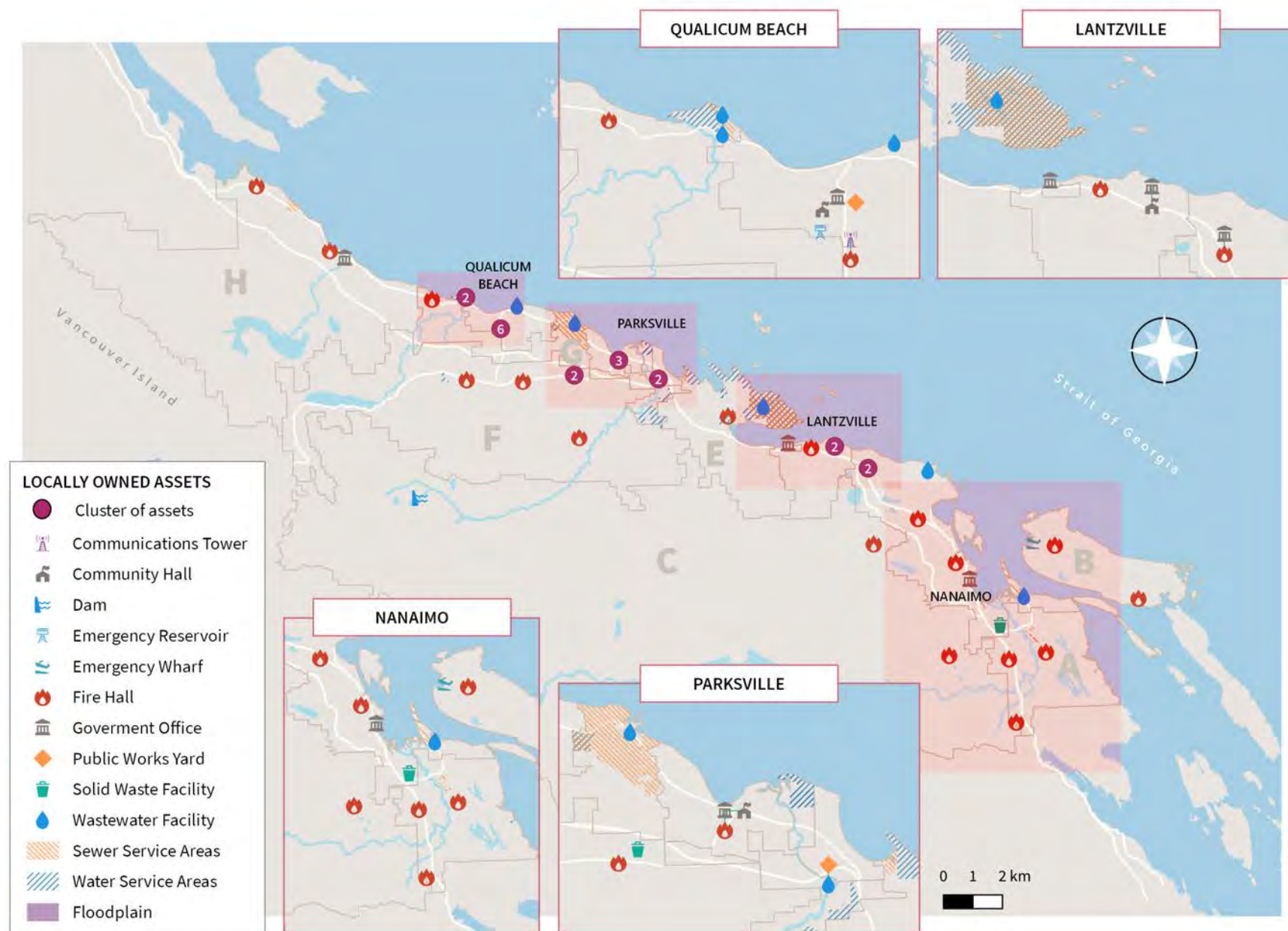
between services and local assets, a far greater number of “Important” dependencies were identified than “Critical” dependencies. This finding suggests that local governments have an element of redundancy, and thus resiliency, built into their critical infrastructure.

The following locally owned assets were deemed critical as a result of the *EMBC Critical Infrastructure Assessment Tool*:

- Fire halls and their assets
- Local government and First Nation Band offices
- Communication technology and infrastructure, including SCADA
- Waste water and solid waste assets
- Drinking water assets

A map of the identified locally owned assets is provided on the following page (see [Figure 5](#)). The full list of the region’s local government owned/operated critical assets can be found in [Appendix 4](#).

Figure 5 – Map of locally owned critical assets and infrastructure



Community Perceptions of Physical Vulnerabilities

As part of one of the engagement session activities, participants were asked to provide details of the physical conditions that they perceive to have the potential to contribute to vulnerability within the region. Thematic analysis of inputs received revealed that participants detailed physical conditions of concern for five of the ten infrastructure sectors: Transportation, Water, Information & Communication Technology, Energy & Utilities, and Healthcare. The summarized and paraphrased results of this activity are presented below:

Transportation Sector

Highway 19

A strong majority of workshop participants expressed concern about the limited transportation connectivity in the region. Highway 19 was identified as a critical piece of infrastructure, with one participant describing it as the “spine that connects the region”. Many workshop participants expressed concern that stretches of Highway 19 are impassable in the event of a disruption or damage due to a lack of alternative routes. The “Nanoose Flats” section of highway (located in Electoral Area E) was identified as a source of particular concern as the section sees high volumes of traffic and has no detour routes. The ability to evacuate and/or access help could be limited should a hazard event impact the highway.

Public Transportation

The limited availability of public transportation in rural areas of the region was highlighted by some participants. With limited bus schedules, and further reduced schedules in the event of inclement weather, some residents may have restricted ability to access resources, e.g. health care centres, food stores etc.

Ferry Infrastructure

As the region is located on an island, there is a dependency on the transportation of resources to the island by ferry. With two ferry terminals in the region (Duke Point and Departure Bay) there is some redundancy, but some participants highlighted the vulnerability of this transportation connection to extreme weather events. The dependency of the region’s small island residents (e.g. those on Gabriola Island) on ferry transport was also noted.

Single Access Route Communities

Several workshop participants noted that there are many rural residences and subdivisions in the region that have only one entry/exit route. If the connecting road is damaged or blocked in a hazard event these residents may have difficulty evacuating their property and first responders may have difficulty accessing and assisting residents.

Energy & Utilities

Power Lines

A majority of workshop participants commented on the susceptibility of the power grid to outages due to downed trees. The proximity of trees to overhead power lines was identified as a physical condition contributing to the community’s vulnerability.

Water Sector

Arrowsmith Dam

The Arrowsmith Dam, which is located approximately 35 km south of the City of Parksville and provides Parksville and Nanoose Peninsula with water, was identified as a critical source of water. The failure of the dam was also noted as a possible hazard event.

Water Treatment Plants

A few workshop participants expressed concern about the ability of the existing water treatment plants to provide sufficient drinking water in a hazard event.

Healthcare

Hospital

The capacity of the local healthcare facilities was identified as a vulnerability by several workshop participants. A number of comments were captured regarding the possible insufficiency of the smaller health care centres and limited access to the region's sole hospital (Nanaimo Regional Hospital) in a hazard event.

Information & Communication Technology

Cell Towers

The heavy reliance on cell towers and potential for outages was noted by a number of workshop participants.

06 Climate Change

Climate change is not an abstract future concern, but rather a current, evolving reality experienced in Canada today. Driven largely by the emissions of greenhouse gases from human activities, Canada's climate has been increasing in temperature and will continue to increase in the coming years. According to a recent report, Canada's climate is warming at a rate nearly twice the global average (Environment and Climate Change Canada, 2019a). Projections suggest that by the years 2081 to 2100, Canada's climate will increase by 1.8°C if emissions are reduced, or up to 6.3°C if emissions remain high (Environment and Climate Change Canada, 2019a).

Within British Columbia, climate change has already resulted in increased average temperatures, rising sea levels, as well as increased rates of severe weather events (BC Ministry of Environment and Climate Change Strategy, 2019). Canada's oceans have also been changing due to increased temperatures contributing to waters that are less oxygenated and increased carbon dioxides in the atmosphere driving acidification of ocean surface waters (Environment and Climate Change Canada, 2019a).

The recently released *Preliminary Strategic Climate Risk Assessment for British Columbia* states that, by the year 2050, the greatest risks to all of British Columbia as a result of climate change will be severe wildfire seasons and seasonal water shortages (BC Ministry of Environment and Climate Change Strategy, 2019).

Climate change is likely to affect the majority of hazards faced in the region. According to the BC Ministry of Environment and Climate Change, "the likelihood of most risk events increases over time based on projections of future climate change" (BC Ministry of Environment and Climate Change Strategy, 2019, p. 1). A large majority of HRVA engagement session participants agreed that climate change would have an impact on the occurrence or severity of most natural hazards. Additionally, those hazards which may result from natural hazards such as a power outages or motor vehicle incidents resulting from severe weather, were also considered likely to increase.

Notable hazards which are projected to increase in frequency and/or severity are outlined below. Additional discussion surrounding the current and anticipated impacts of climate change is included for the Top Hazards identified in the region in [Section 08](#).

Wildfire

Climate change is a significant contributing factor to the recent trend of longer and more extreme fire seasons. As several areas in the region are classified as extreme or high interface fire hazard ratings, the overall risk of wildfires to the region is projected to increase. Severe wildfires can cause negative health impacts, which can be particularly hazardous for those with pre-existing health conditions; population displacement, which can have lasting impacts on the psychological wellness and result in economic losses for individuals and families; and cause serious disruptions or damage to infrastructure systems such as transportation,

telecommunications, electricity supply, water treatment and sewage systems (BC Ministry of Environment and Climate Change Strategy, 2019).

Flooding

Overland Flooding

Overland flooding (also known as “pluvial flooding”) is usually associated with high intensity rainfall events but can also occur with lower intensity rainfall or melting snow where the ground is saturated, frozen, developed or otherwise has low permeability, resulting in overland flow and flooding (Maksimovic, 2015). As communities continue to develop and grow, and further effects of climate change appear, the likelihood and severity of overland flooding will increase through the combination of increased rainfall, increased impermeable surfaces, and drainage systems reaching capacity ultimately restricting rainwater from either being absorbed into the ground or draining properly (Szewrański, et al., 2018).

Rivers, Lakes and Streams Flooding

With global temperatures rising due to climate change, rainfall and storm events are anticipated to increase in severity and frequency, which will have a cascading effect to river and streamflow regimes that may elevate the potential for fluvial floods over time (Ashmore & Church, 2001).

Coastal Flooding

Climate change is a probable contributor to the occurrence of coastal flooding. Temperature increase affects sea level rise and causes “thermal expansion of the oceans and melting of glaciers, ice caps, and ice sheets” (Shaw, Taylor, Solomon, Christian, & Forbes, 1998, p. 365). It is projected the waters along Vancouver Island’s east coast will rise by a minimum of 0.8m by the year 2100 (Regional District of Nanaimo, 2019b), and that coastal regions will not only be affected by rising sea levels, but also storm surges, wave conditions, and river flow (Ranasinghe & Jongejan, 2018). As these levels continue to increase, coastal communities that are extremely low-lying may be at risk of consistent flooding (Regional District of Nanaimo, 2017a).

Furthermore, the frequency of king tides is predicted to increase in the coming years due to the effects of climate change (Hernandez, 2018). While king tide events on their own can result in water levels that are upwards of five metres, if they occur in combination with a storm surge, these levels can be even greater with the severity of impacts escalating as well (Little, 2018).

Flood Consequences

The impacts of major floods can be devastating and range from property damage and population displacement, to impacts to the environment and cultural resources (Regional District of Nanaimo, 2019b). Flood, as a single hazard, is considered the costliest hazard event for Canadians with respect to property damage (Public Safety Canada, 2015c), and can have lasting psychosocial and support system impacts.

Wind Event

The frequency and intensity of wind events is expected to increase as the climate warms. In fact, a recent report from BC Hydro (2018) states that there has already been a noted increase in both the recurrence and severity of storms and extreme weather events. These stronger, more frequent wind events will likely cause considerable damage to infrastructure, properties, power lines, and trees resulting in increased social and economic costs to the region.

Drought

A warming climate and changes in precipitation are projected to increase the likelihood, and therefore the risk, of drought in the future (BC Ministry of Environment and Climate Change Strategy, 2019). The potential effects of climate change on drought were discussed during the HRVA engagement process. Participants anticipate that a decrease in snowpack will lead to less water supply for rivers and streams in the region and will likely contribute to drought conditions in the future (Engagement Process, 2018-2019). In addition, engagement participants shared details of long-term cascading effects of drought such as the risk of trees drying out, ultimately becoming more vulnerable to strong winds in the fall and winter months, and the risk of being uprooted and falling. These conditions during a severe windstorm could pose a serious risk to safety and cause power outages in the region.

Salt Water Intrusion

Contributing factors to saltwater intrusion include sea level rise, which can affect the hydraulic gradient and cause saltwater to move towards the aquifer; storm surge, which can lead to saltwater intrusion due to surface flooding; as well as coastal erosion, which reduces landmass and moves the saltwater/freshwater interface closer to land, thus allowing saltwater to enter the freshwater aquifer. All three of these factors (sea level rise, storm surge and coastal erosion) have been identified as hazards that will be affected by climate change.

As the need for drinking water increases as a result of population growth or climatological factors such as increased heat events or drought, an increased stress is placed on groundwater supply, which leads to a greater risk of saltwater intrusion (Government of British Columbia, 2016b; Prince Edward Island Department of Environment, Labour and Justice, 2011).

Saltwater intrusion has already started occurring in several of the communities located in the region. A study conducted in 1978 found evidence of saltwater intrusion in aquifers in the areas of Silva Bay, Degnen Bay, east of Lock Bay, and Pilot-Taylor Bay (Hodge, 1978). Gabriola Island has been identified as having high well density ratings, limited lakes and rivers on the island, and receives little to no snow in winter. As a result, in the summer months when precipitation declines and demand for water increases, saltwater intrusion occurs in deeper wells. The effects of saltwater intrusion have also been observed in other areas of the region such as the Dashwood area located in Watershed #1, and along the foreshore of both Watershed #6 and #7 (Regional District of Nanaimo, 2011b).

In addition to the drinking water impact, saltwater intrusion can have negative consequences on soil fertility and the health of plants, affecting local industry and agricultural resources. The presence of salt in soil can significantly affect crop growth and therefore directly impact agriculture industry if the saltwater intrusion into the aquifer continues (Delta Optimist, 2015).

Heat Event

According to Environment and Climate Change Canada, it is virtually certain that Canada's climate has warmed and that it will warm further in the future (Bush & Lemmen, 2019). Within BC, heat events or days with temperatures of 32°C or higher are anticipated to be more prevalent in the years to come, with heat waves predicted to occur roughly every 3 to 10 years (BC Ministry of Environment and Climate Change Strategy, 2019).

As heat waves become more frequent and severe, impacts may intensify with risks to human health, stress to infrastructure and transportation systems, economic productivity, and ecosystems (BC Ministry of Environment and Climate Change Strategy, 2019).

Rainfall Event

It is predicted that within the next 30 years, climate change will result in an increase in both the severity and occurrence of rainfall events, as well as a minor annual precipitation increase in BC (BC Ministry of Environment and Climate Change Strategy, 2019). High intensity rainfall events can cause localized flooding as well as flooding over a large region, resulting in population displacement, and damage to infrastructure, such as roads and buildings (Bush & Lemmen, 2019).

In Summary

While climate change is a global phenomenon, a variety of factors determine how the impacts of climate change manifest at the local level. Of note, urbanization can substantially influence local climate resilience. The development and transformation of the natural environment to urban landscapes, composed of buildings, parking lots and roadways, increases the impermeable surfaces leading to reduced rainfall absorption which, in turn, increases the potential for localized flooding. The conversion from rural to urban also introduces materials which typically absorb more solar radiation, and thus increases local temperatures (Environment and Climate Change Canada, 2019a).

With projected population growth in the region estimated at 12% over the next decade, increased development and transition from a rural to more urban environment is anticipated. The impacts of urbanization and other land cover changes and their compounding effects on climate change should be considered when determining adaptation and mitigation strategies for the future.

07 Hazard Assessment Results & Risk Scores

Risk is commonly calculated by multiplying the likelihood score by the total consequence score, as follows:

$$\text{Risk} = \text{Likelihood} \times \text{Consequence}$$

While this equation provides a useful measure of the risk posed by each hazard to the region, the scores should be interpreted as best estimates and not absolutes. The qualitative methods used to assess hazard likelihood and consequence entail a degree of subjectivity that cannot be eliminated. Repeating the assessment with a different group of people may produce differences in results.

RISK SCORES

The comparison of risk scores across all hazard categories (natural, technological, and conflict-related), revealed that natural hazards pose the greatest risk to the region (see Table 11). Natural hazards (Wildfire and Urban Interface Fire, Overland Flooding, Wind Event, and Drought) account for the top four highest rated hazards. The Wildfire and Urban Interface Fire hazard has the highest risk score (185) of all the hazards, with a likelihood value of 5 and an overall consequence value of 37. The natural hazard category also accounts for the most likely hazards for the region, as well as many of those with the highest consequence. The Megathrust Earthquake hazard, while low on the likelihood scale, has the highest overall consequence score (55) of all the hazards.

Of the technological hazards, Motor Vehicle Incident has the highest risk score (124), followed closely by Electrical Power Outage and Structure Fire (both have risk scores of 120). While several of the conflict hazards were found to have high overall consequence scores, e.g. Intentional Acts of CBRNE, Active Threat, Hijacking, all these hazards were relatively low on the likelihood scale and received lower risk scores as a result.

Previous HRVAs conducted for the Regional District of Nanaimo, City of Parksville and District of Lantzville in 2009 noted the following as the highest rated hazards.

Regional District of Nanaimo	City of Parksville	District of Lantzville
• Earthquakes • Epidemics – Human • Fire – Interface & Wildfire • Floods	• Earthquake • Fire – Interface & Wildfire • Epidemics – Human	• Earthquake • Fire – Interface & Wildfire • Epidemics – Human

The top hazards identified in this HRVA (2019) are aligned with previous HRVAs. Wildfire and floods were identified as presenting the greatest risk to the region, and earthquakes (megathrust) determined to have the highest total consequence. The HRVA also identified human disease as posing very high consequences to the region, though the likelihood assigned resulted in a lower overall risk score.

Additional top hazards identified in this 2019 HRVA have been detailed in [Section 08](#).

Risk Score Table

The results of the analysis are presented in the risk score table below (see Table 11). Hazards are listed from highest to lowest risk (hazards with tied risk scores are ordered by total consequence score and then alphabetically). The scoring system yields a minimum total risk score of 11, and a maximum of 275 (see calculations below):

<i>Minimum likelihood rating</i>		<i>Minimum consequence rating for all 11 categories</i>		<i>Minimum risk score</i>
1	x	(1 x 11)	=	11
<i>Maximum likelihood rating</i>		<i>Maximum consequence rating for all 11 categories</i>		<i>Maximum risk score</i>
5	x	(5 x 11)	=	275

Accompanying each hazard's risk score is a measure of confidence (rated A – "very high" to E – "very low") in the likelihood estimate and impact ratings for the specific hazard event. When determining the level of confidence in the hazard assessment, the project team considered the quality and type of available data (e.g. qualitative vs. quantitative), the availability of subject matter experts during the risk assessment process, and the current body of knowledge for specific hazard events.

Full hazard assessment scores (including confidence ratings for all 11 consequence categories) can be found in the All Scores Table in [Appendix 3](#).

Table 11 – Risk Scores

Category	Hazard	Likelihood (1-5)	Human & Social Impacts (6-30)	Physical & Economic Impacts (5-25)	Overall Consequence (11-55)	Risk	Confidence Rating
	Fires (Wildfire and Wildland-Urban Interface)	5	19	18	37	185	(A)
	Overland Flooding	5	15	14	29	145	(C)
	Wind Event	4	16	19	35	140	(A)
	Drought	5	12	16	28	140	(B)
	Motor Vehicle Incident	4	19	12	31	124	(B)
	Electrical Power Outage	5	13	11	24	120	(B)
	Structure Fire	5	14	10	24	120	(A)
	Rivers, Lakes, and Stream Flooding	5	9	14	23	115	(B)
	Coastal Flooding	5	10	12	22	110	(C)
	Freeze Event	5	10	11	21	105	(B)
	Saltwater Intrusion	5	10	11	21	105	(C)
	Landslide	4	13	13	26	104	(C)
	Hazardous Material Release Land	4	13	13	26	104	(C)
	Insect Infestation and Plant Disease	4	12	14	26	104	(D)
	Air Quality	4	14	11	25	100	(B)
	Coastal Erosion and Sedimentation	5	8	12	20	100	(C)
	Human Disease	3	21	12	33	99	(C)
	Snow Event	4	13	10	23	92	(B)
	Animal Disease	4	9	13	22	88	(D)
	Food Supply Chain Interruption	3	16	13	29	87	(D)
	Marine Vessel Incident	3	16	13	29	87	(C)
	Land Subsidence and Sinkholes	5	9	8	17	85	(C)
	Hazardous Material Release Marine	3	12	15	27	81	(C)
	Potable Water Supply Interruption	3	16	11	27	81	(C)
	Fog	5	9	7	16	80	(B)
	Heat Event	5	11	5	16	80	(B)
	Fuel Supply Interruption	3	13	13	26	78	(D)
	Earthquake	3	11	13	24	72	(B)
	Intentional Acts of CBRNE	2	18	17	35	70	(E)
	Thunderstorm	5	6	8	14	70	(C)

Category	Hazard	Likelihood (1-5)	Human & Social Impacts (6-30)	Physical & Economic Impacts (5-25)	Overall Consequence (11-55)	Risk	Confidence Rating
	Cyber Security Threat	3	10	13	23	69	Ⓓ
	Geomagnetic Storm	3	8	15	23	69	Ⓓ
	Active Threat	2	19	14	33	66	Ⓓ
	Cold Event	3	12	10	22	66	Ⓑ
	Hail	5	7	6	13	65	Ⓒ
	Aircraft Incident	2	18	14	32	64	Ⓒ
	Dam Failure	2	16	16	32	64	Ⓑ
	Rainfall Event	4	10	6	16	64	Ⓑ
	Communications Interruption	3	10	11	21	63	Ⓑ
	Bridge Collapse	2	15	14	29	58	Ⓓ
	Megathrust Earthquake	1	30	25	55	55	Ⓒ
	Building Collapse	2	15	11	26	52	Ⓒ
	Public Disturbance	2	14	12	26	52	Ⓒ
	Waste Water Interruption	2	12	13	25	50	Ⓒ
	Volcanic Ash Fallout	2	10	13	23	46	Ⓒ
	Hijacking	1	16	16	32	32	Ⓓ
	Seiche	1	18	12	30	30	Ⓔ
	Tsunami	1	17	13	30	30	Ⓑ
	Health Interruption	1	13	10	23	23	Ⓑ
	Incident at the CFM-ETR	1	11	9	20	20	Ⓓ
	Rail Incident	1	10	10	20	20	Ⓒ
	Avalanche	1	7	5	12	12	Ⓑ
	Extraterrestrial Debris	1	6	5	11	11	Ⓔ

Legend

Hazard Category

-  Natural Hazard
-  Technological Hazard
-  Conflict Hazard

Confidence Rating

- Ⓐ Very high degree of confidence
- Ⓑ High degree of confidence
- Ⓒ Moderate confidence
- Ⓓ Low confidence
- Ⓔ Very low confidence

Risk Matrices

Risk matrices provide a visual representation of the values presented in Table 11. The likelihood that the hazard will occur is represented on the y-axis and the consequence of the hazard is represented on the x-axis in the following matrices (*Figure 6 – Figure 9*). Plotting risk in this fashion provides a quick, clear view of the risks across all hazards and can serve as a useful tool in promoting robust discussions, determining unacceptable levels of risk, and arriving at highest priority hazards for risk management and emergency preparedness activities. Four risk matrices are provided on the following pages, one for all hazards considered in the assessment and one for each hazard category (natural hazards, technological hazards, and conflict-related hazards).

Figure 6 – All Hazards Risk Matrix



Figure 7 – Natural Hazards Risk Matrix



Figure 8 – Technological Hazards Risk Matrix

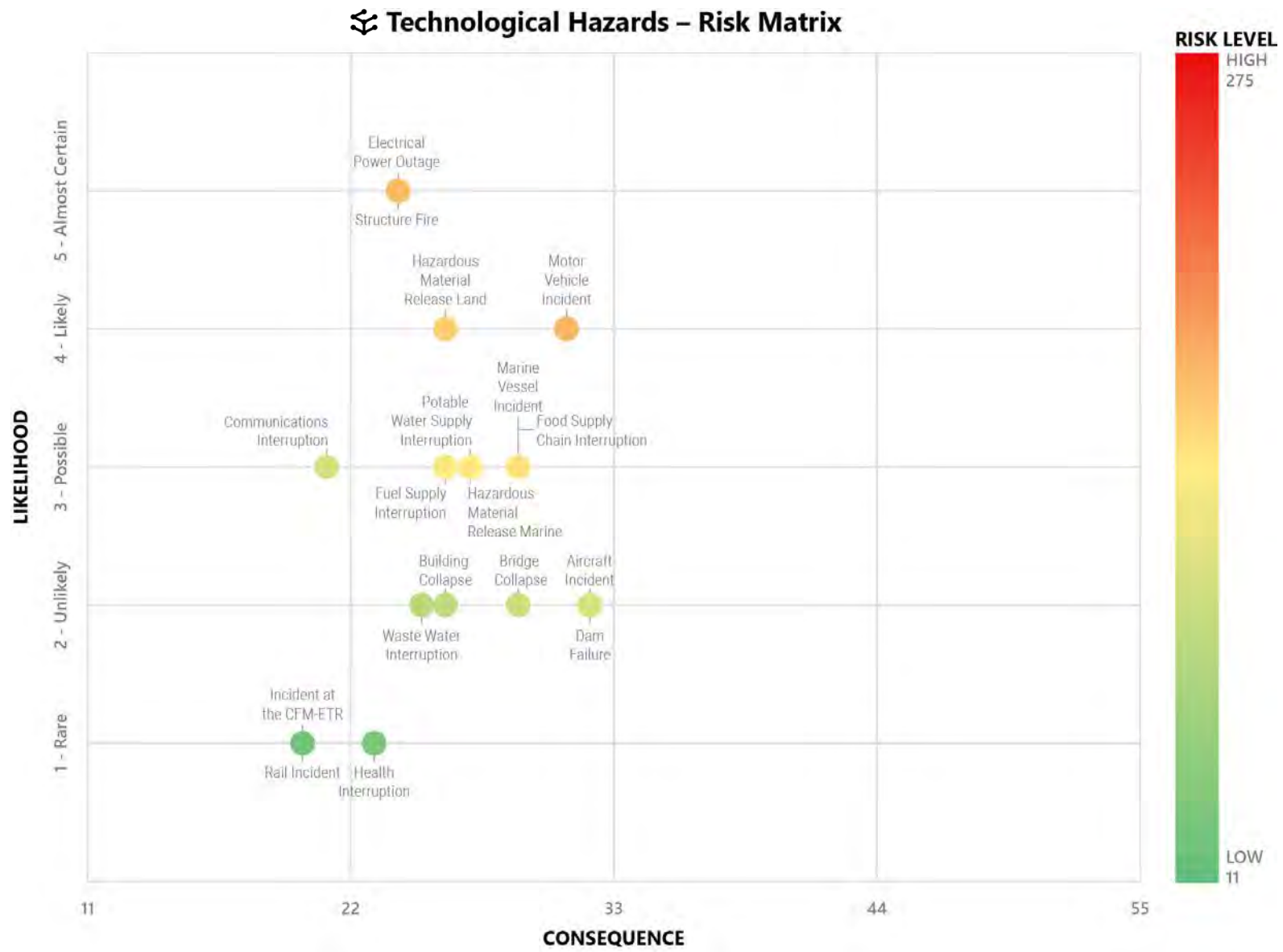
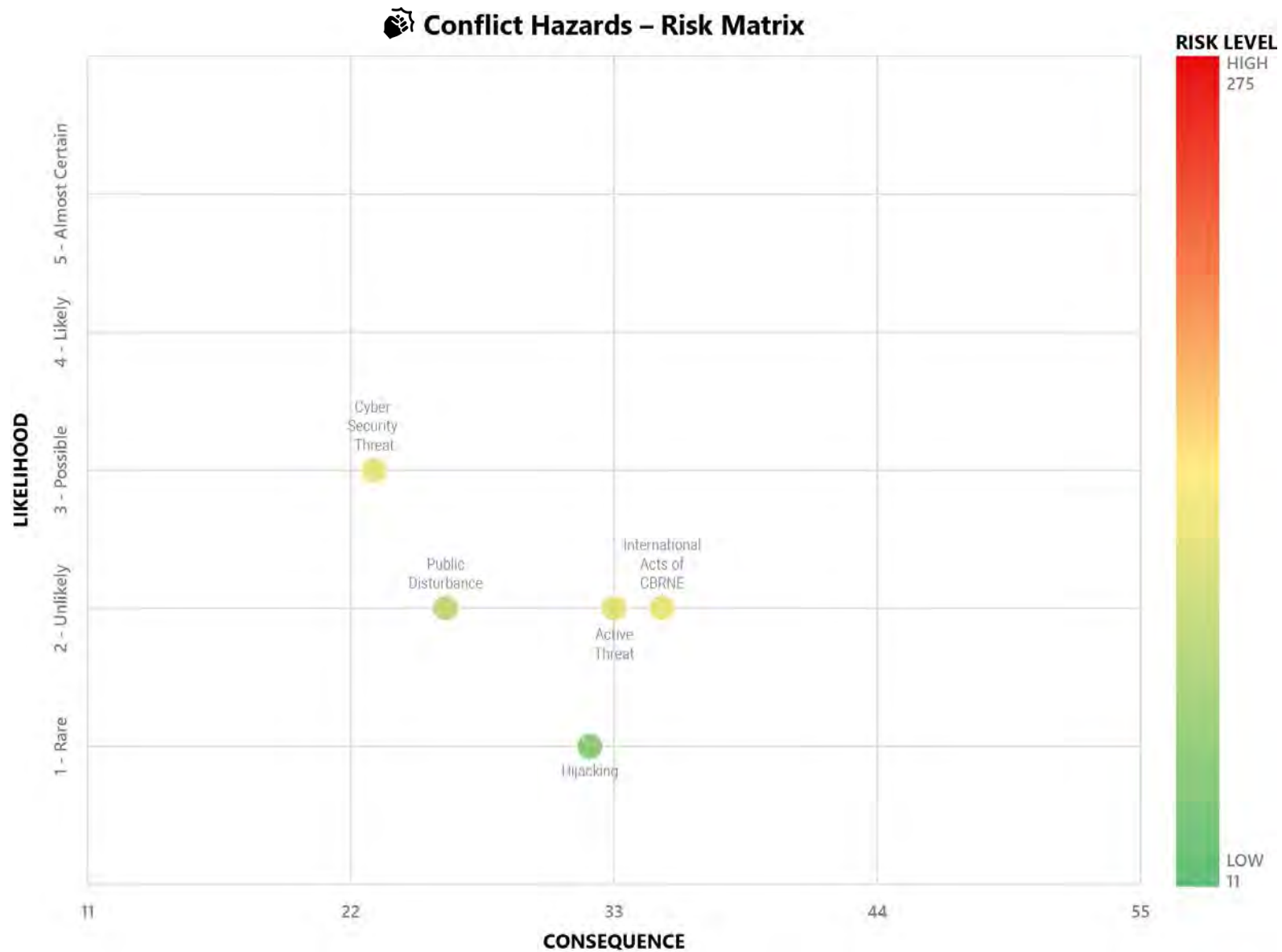


Figure 9 – Conflict Hazards Risk Matrix



08 Top Hazards

In total, the relative risk of 53 hazards was assessed based on their likelihood of occurring and potential consequences. Due to the multiplication factor involved in calculating the overall risk score, the hazards with the highest overall risk score tended to be those which had higher likelihoods. Several hazards were determined to have a very high consequence rating, but a low likelihood rating, which meant they fell lower in the risk table. As such, when determining the “Top Hazards” for the region, a filter was applied to capture those high consequence/low likelihood hazards, in addition to the hazards with high overall risk scores.

The Top Hazards for the region (see [Table 12](#) and [Figure 10](#)) were identified using the following criteria:

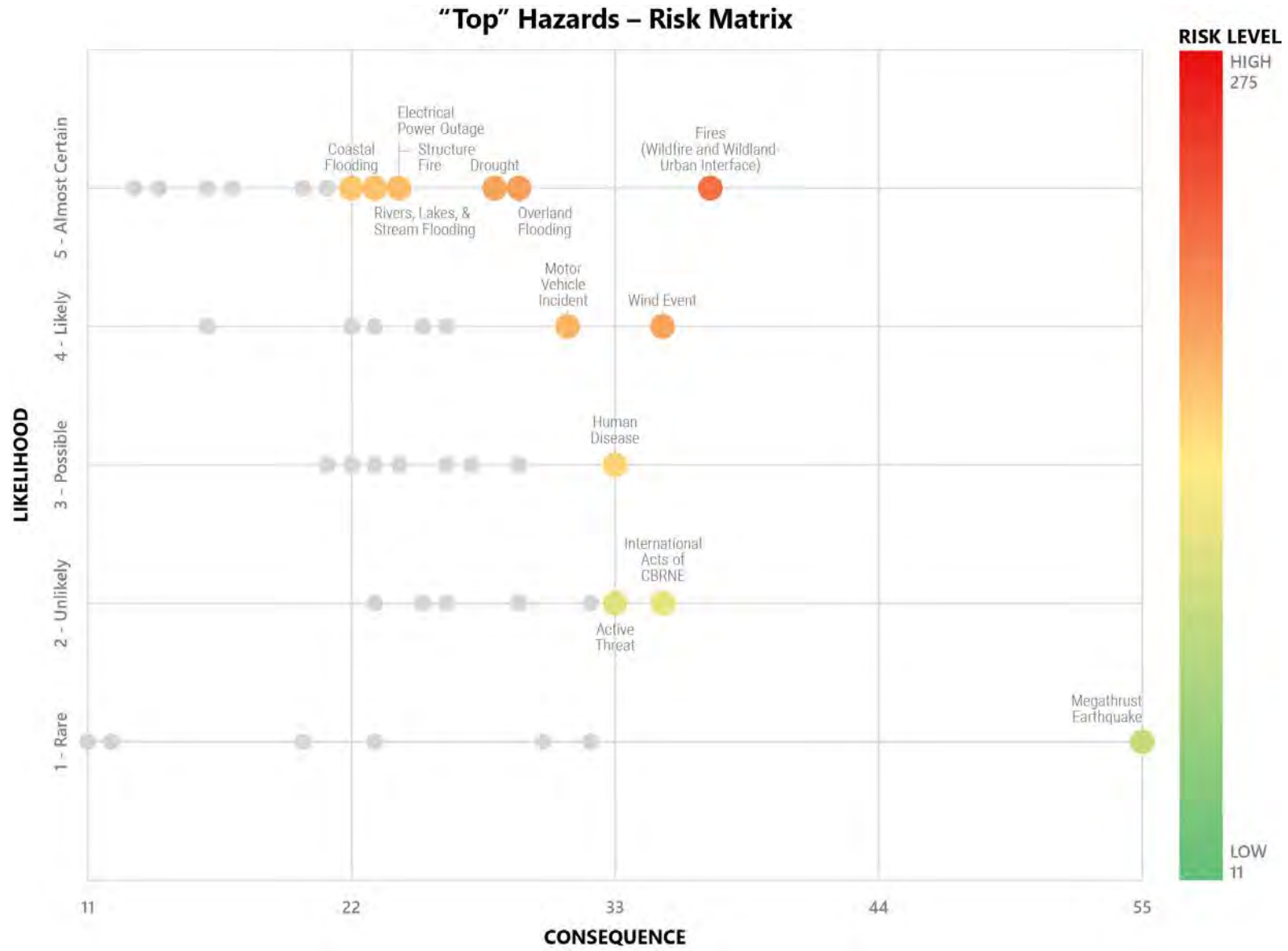
- a high overall risk score ≥ 110 , or
- a high overall consequence rating ≥ 33

Table 12 – Top hazard for the region

Hazard	Likelihood (1-5)	Overall Consequence (11-55)	Risk
Fires (Wildfire and Urban Interface)	5	37	185
Overland Flooding	5	29	145
Wind Event	4	35	140
Drought	5	28	140
Motor Vehicle Incident	4	31	124
Electrical Power Outage	5	24	120
Structure Fire	5	24	120
Rivers, Lakes, and Stream Flooding	5	23	115
Coastal Flooding	5	22	110
Human Disease	3	33	99
Intentional Acts of CBRNE	2	35	70
Active Threat	2	33	66
Megathrust Earthquake	1	55	55

The Top Hazards described on the following pages provide further insight into the risk score assigned. The descriptions detail the occurrence of the hazard locally; potential or actual consequences of the hazard as evidenced through research or notable historical incidents; as well as a discussion around evolving conditions which may affect the likelihood and/or severity of impacts due to factors such as climate change or urbanization.

Figure 10 – "Top" Hazards Risk Matrix



FIRES (WILDFIRE AND URBAN INTERFACE)

	HAZARD	LIKELIHOOD		HUMAN & SOCIAL IMPACTS	PHYSICAL & ECONOMIC IMPACTS		RISK
	Wildfire and Urban Interface Fires	5	x	(19	+ 18)	=	185

Wildfires are typical of forested and grassland areas. With more than 60 percent of the province forested, British Columbia is particularly susceptible (Government of British Columbia, n.d.-j). Wildfires can be natural or human-caused, with lightning strikes accounting for approximately 60 percent of ignitions in British Columbia annually (Government of British Columbia, n.d.-j).

Within the region, there are several zones with extreme or high interface fire hazard ratings. Electoral Areas A, B, C and H have a high concentration of regions rated as extreme, meaning the risk is very serious as fires can start easily, spread quickly and make suppression efforts difficult (Regional District of Nanaimo, n. d.-b; Government of British Columbia, n.d.-d).

Like many areas of BC, climate and topography make the region prone to wildfires. Bow Horn Bay, for example, which encompasses the Electoral Area H communities of Bowser, Qualicum Bay, Dunsmuir, Spider Lake and Qualicum First Nation, is in the Nanaimo Lowland Ecosection. As described in the Community Wildfire Protection Plan (2007), Bow Horn Bay is classified in the Coastal Douglas-fir Subzone (CDFmm), which extends along Vancouver Island's southeast coast. Douglas-fir is prominent in the CDFmm, while shore pine, red alder, dogwood, and broadleaf maple are also found in several areas, along with a variety of underlying tree and plant species. The dense coniferous stands, substantial ladder fuels like shrubs, low branches, and dry leaves, combined with steep slopes could influence both the likelihood of ignition and the speed at which a fire may spread (Strathcona Forestry Consulting, 2007). If extreme fire weather were to occur, strong winds could quickly advance a fire through large areas of lowland forest. Additionally, the risk of ignition to large forested properties and structures, including homes and businesses, is high in areas with close proximity to wildland fuels.

Within Electoral Area B, much of Gabriola Island is rated at a high to extreme risk of interface fire (Strathcona Forestry Consulting, 2008). Summer weather systems in the area can range from moist with low to moderate fire conditions, to windy and excessively dry, resulting in high to extreme risk of fire hazard. The steepness of a slope affects the speed and direction in which wildfire spreads; steep dry slopes can cause fires to spread more rapidly, as compared to moist flat areas (Government of British Columbia, n.d.-i). Gabriola Island is made up of gentle to moderate slopes, with a long gradual northwest-southeast ridge extending along its centre. Should an ignition occur amid high temperatures and low humidity, winds could cause a fire to spread quickly up the slopes of the Island and through its wooded interior (Strathcona Forestry

Consulting, 2008). Dense coniferous stands combined with a high proportion of extremely flammable ladder fuels pose a greater risk of ignition and spread of wildfire, and a moderately deep organic layer of woody debris, foliage, needles and brush may be highly combustible in certain seasons. Additionally, several large grassy areas like parks, agricultural lands and coastal bluffs are present, through which wildfire can travel in dry conditions. Many residential and commercial structures are located in high-risk interface areas and surrounded by combustible vegetation, while remote or difficult to access properties could make fire suppression challenging (Strathcona Forestry Consulting, 2008).

The majority of Electoral Area C is heavily forested, with its population density concentrated along the southeast boundary. While the fire hazard ratings of communities like Extension, Pleasant Valley and East Wellington can range from moderate to high depending on conditions, the stretch to the west, along South Forks Road and Nanaimo River Road, rates as extreme, as do the forested landscapes north of and bisecting Nanaimo Lakes (Regional District of Nanaimo, n.d.-b). Much of this electoral area is made up of rugged second and third growth forested hills of varying slope, with rural residential, agricultural, forestry and recreational properties dispersed throughout. While the upper portion consists primarily of unpopulated forestry land, a number of campgrounds and recreational vehicle parks are concentrated around the Nanaimo Lakes region, as are popular hiking and biking trails (Regional District of Nanaimo, 2019c). Warm dry summers, which are not uncommon for the region and often include periods of drought, may create high-risk interface areas in remote locations, which could make evacuation and/or firefighting efforts difficult in the event of a fast-moving wildfire.

As described in Electoral Area A's Official Community Plan, the risk of interface fire is rated moderate, high or extreme for a substantial portion of the region (Regional District of Nanaimo, 2011a). With rural developments, agricultural lands, and recreational areas, such as Hemer Provincial Park, intersecting with second growth forest, the majority of the electoral area's eastern stretch is at extreme risk of interface fire.

Wildfire events can seriously impact the communities in which they occur, as illustrated by Vancouver Island's wildfire event that took place on August 5, 2018. The human-caused "Nanaimo Lakes Wildfire" burned 185.3 hectares near Nanaimo River Road (British Columbia iMapBC). The Regional District of Nanaimo declared a local state of emergency issuing an evacuation order and alert on August 6, 2018, placing 77 homes east of the fire on evacuation alert, displacing residents at Barsby Lakes and recreational users and cabin residents at Nanaimo Lakes (Regional District of Nanaimo, 2018b).

Disruption to or loss of the region's critical infrastructure could have significant adverse effects. Though critical infrastructure owners and operators have protective measures in place to mitigate impacts from wildfires, and are represented in the planning and coordination calls hosted by the Province, impacts can happen to critical infrastructure which complicate the response and recovery to wildfires in the region. Disruption to transportation routes,

communications services, medical facilities or utilities within the interface area could also put the safety, security or economic well-being of the affected community at risk.

An engagement session participant who was the Operations Section Chief at the Incident Command Post (ICP) for the Nanaimo Lakes Fire recapped his experience:

"The fire broke out early August, grew to about 25 hectares within the first couple of hours, and eventually to 180 hectares. It started under a power line that actually serves a bunch of southern Vancouver Island, quite a high risk there with the BC Hydro lines. It was also in close proximity to the City of Nanaimo water supply, as well as the water treatment plants, resulting in the evacuation order for a couple of homes and an alert for several dozen more. It was initially the highest priority fire in BC by BC Wildfire, but quickly overtaken by many other fires in the interior and up north. At one point BC Wildfire had 3 heavy helicopters on scene, great collaboration by BC Wildfire, Vancouver West, Regional District of Nanaimo and the City of Nanaimo. There was one responder fatality; a water tender driver unfortunately had a heart attack and he passed away." – Operations Section Chief at Nanaimo Lakes Fire ICP

As evidenced during the Fort McMurray wildfires of 2016, transportation corridors play a critical role as evacuation routes and disruptions due to fire activity can lead to potentially devastating consequences. Approximately 88,000 people were forced to evacuate via Highway 63, the city's only road in and out of town, as "walls of flames showered embers and ash onto the road" (Thurton, 2017, para. 2). The mass evacuation resulted in massive traffic jams that caused people to be stuck on the highway for up to 15 hours, as "flames whipped alongside them" (Thurton, 2017, para. 12).

The region's Gabriola Island is accessible only by ferry, which could make evacuation of the island's more than 4,000 residents difficult in the event of a fast moving wildfire (Government of British Columbia, n.d.-b). Within other areas of the region, closure or delay along major roads or intersections such as Highway 1 or Highway 19 could directly impact those required to use these routes during an evacuation. For example, Highway 19's Nanoose Flats is considered to be a detour-less portion of the highway with no alternate routes for redirecting traffic through which an average of 30,000 vehicles travel daily (BC Ministry of Transportation and Infrastructure Online, 2019). A number of communities and properties in the region are accessible only by one road in and out, which could also pose challenges evacuating if those routes were impacted by fire.

Wildfires can be traumatic and painful events for those affected. Psychological distress may follow the loss of a home or belongings, the act of having to leave pets and livestock behind, and the stress of the unknown (Vomiero, 2017). Trauma caused by wildfire may lead to a variety of psychological issues, including (but not limited to) acute stress disorder, adjustment disorder, and post-traumatic stress disorder (PTSD), all of which can impact social, familial or occupational

functioning (Vomiero, 2017). A study following the 2016 Fort McMurray wildfire found many victims experienced “elevated rates of depression and related mental health problems,” (Weber, 2018) such as substance or alcohol abuse disorder, depression and/or anxiety. Similarly, mental health symptoms such as depression and suicidal thinking among impacted adolescents were significantly higher, as compared to adolescents unaffected by the Fort McMurray fires (Brown, et al., 2019).

Wildfires can have significant economic and environmental impacts. Provincial wildfire suppression and response costs exceeded \$1.1 billion between 2017 and 2018, which does not take into account indirect costs like economic disruptions, lost tourism revenues or social impacts like unemployment (Abbott & Chapman, 2018; Government of British Columbia, n.d.-k). The economic costs of fires are also noted to be increasing over time. The 2011 Slave Lake fire cost insurance companies an estimated \$700 million, while costs from the 2016 Fort McMurray fire are estimated at \$9 billion.

In recent years, the frequency and severity of wildfires has increased, and this trend is predicted to continue. The 2018 wildfire season marked British Columbia’s worst fire season on record in terms of area, with 1.35 million hectares burned, up from 1.2 million in 2017. Additionally, the number of people displaced was unprecedented at approximately 65,000 (Government of British Columbia, n.d.-k). As a result of the wildfires, hundreds of families lost their homes and dozens of other structures were lost, including commercial buildings, sheds, and barns (Johnston, 2018). Contributing factors include the continued growth of the wildland urban interface, the expansion of infrastructure on forested land base, and fires that burn hotter due to prolonged drought conditions, and faster and more dangerously due to unnaturally high fuel loads (Ministry of Forest, Lands and Natural Resource Operations, 2015; Maher, 2019). The intense heat involved in major fires can also pose greater environmental consequences if the soil in forests becomes dried out and damaged to the point it cannot reforest (Maher, 2019).

With several areas in the region classified with extreme or high interface fire hazard ratings, the significant consequences posed by wildfire and wildland urban interface fires, and the trend to longer and more extreme fire seasons as a result of climate change, the wildfire hazard presents the greatest risk to the region.

Wildfire and Urban Interface Fires

Wildfire: *An unplanned fire – including unauthorized human-caused fires – occurring on forest or range lands, burning forest vegetation, grass, brush, shrub, peat lands, or a prescribed fire set under a regulation which spreads beyond the area authorized for burning* (EMBC, n.d.-b).

Wildland Urban Interface (WUI): *Any area where combustible forest fuel is found adjacent to homes, farm structures, or other outbuildings. This may occur at the interface, where development and forest fuel (vegetation) meet at a well-defined boundary, or in the intermix, where development and forest fuel intermingle with no clearly defined boundary* (EMBC, n.d.-b).

FLOOD HAZARDS

Floods are the most frequent natural hazard in Canada. They can occur at any time of the year and are most often caused by heavy rainfall, rapid melting of a thick snow pack, ice jams, or more rarely, the failure of a natural or human-made dam (Public Safety Canada, 2018b).

While water level fluctuations are natural occurrences, people generally refer to high-water levels as flood conditions when the water threatens lives, property, and critical infrastructure (Public Safety Canada, 2015c). Flood, as a single hazard, is considered the most economically impactful hazard event for Canadians with respect to property damage (Public Safety Canada, 2015c),

For this HRVA, various flood hazard types were assessed individually to provide a more specific and accurate analysis of the flood risk in the region and include:

- Overland Flooding
- Rivers, Lakes, and Stream Flooding
- Coastal Flooding

The assessment concluded that all three flood hazard types were “Almost Certain” to occur (likelihood score = 5) within the region. The susceptibility of individual areas within the region to each flooding type varies and is a function of an area’s exposure, vulnerability, and local conditions. A combination of local geography, topography and meteorological conditions may result in multiple flood types occurring at once, or one flood type causing secondary flood hazards. For example, highly populated areas are typically more developed and contain a greater presence of impermeable surfaces. Within the region, coastal areas have the greatest population density, and as such, are susceptible to the impacts of both coastal flooding, as well as overland flooding.

The potential consequences of the various flood types are, for the most part, very similar. Possible impacts across all flood types include property damage, the requirement to evacuate resulting in population displacement, as well as impacts to the environment and cultural resources (Regional District of Nanaimo, 2019b).

For these reasons, while each flood hazard has been described separately in the sections below to communicate the individual risk score and describe the relevance of the specific hazard to the region, the discussion of the consequences of the three flood hazard types, has been combined.

OVERLAND FLOODING

	HAZARD	LIKELIHOOD		HUMAN & SOCIAL IMPACTS	PHYSICAL & ECONOMIC IMPACTS		RISK
	Overland Flooding	5	x	(15	+ 14)	=	145

Overland flooding (also known as “pluvial flooding”) results from rainfall generated overland water flow, before the runoff enters any watercourse or sewer. It is usually associated with high intensity rainfall events but can also occur with lower intensity rainfall or melting snow where the ground is saturated, frozen, developed or otherwise has low permeability resulting in overland flow and ponding in depressions in the topography (Maksimovic, 2015). High intensity ‘extreme’ rainfall events in urban environments may cause sewerage or drainage systems to be completely overwhelmed and result in flooding. Agricultural areas where natural drainage has been altered over time can also be susceptible to overland flooding impacts.

Overland flooding has also been referred to as the “invisible hazard” as it can happen without notice in areas that do not typically experience regular flooding (Houston, et al., 2011). With limited or no time to prepare, coupled with the fact that typical flood mitigation measures are likely not in place, the potential consequences associated with overland flood events can be severe.

Within the region, increasing urban development in lower watershed reaches has led to an increase in impervious surfaces such as roads, buildings, driveways, sidewalks etc. This shift in the built environment has, in some areas, resulted in the loss of natural hydrologic function and an associated increase in surface runoff. This growth in urbanized areas, paired with increases in high intensity rainfall events due to climate change, is expected to result in more frequent and severe pluvial flooding events (Szewrański, et al., 2018).

Overland Flooding

Overland flooding (also known as “pluvial flooding”) results from rainfall-generated overland flow. This type of flooding is usually associated with high intensity rainfall events (typically >30mm/h) but can also occur with lower intensity rainfall or melting snow where the ground is saturated, frozen, developed or otherwise has low permeability resulting in overland flow and ponding in depressions in the topography (Maksimovic, 2015).

High intensity ‘extreme’ rainfall events in urban environments may cause sewerage/drainage systems to be completely overwhelmed and result in flooding.

RIVERS, LAKES, AND STREAM FLOODING

HAZARD	LIKELIHOOD	HUMAN & SOCIAL IMPACTS	PHYSICAL & ECONOMIC IMPACTS	RISK
 Rivers, Lakes, And Stream Flooding	5	x	(9 + 14) =	115

The region contains a variety of freshwater features including a large number of rivers, lakes, and streams, a selection of which are listed in [Table 13](#) (Regional District of Nanaimo, 2011b).

There are three major floodplains within the region: The Nanaimo River Floodplain; the Little Qualicum River Floodplain; and Englishman River Floodplain (Regional District of Nanaimo, 2018a). Each of these rivers has a notable flooding history, which is captured in a subsequent section (see [Flooding in the Region](#)).

In addition to these significant floodplains, additional watercourse floodplains have been identified according to the floodplain designations detailed under the "Regional District of Nanaimo Floodplain Management Bylaw No. 1469, 2006".

Under the requirements of the bylaw, land that is:

- within thirty (30) metres from the Natural Boundary of the Englishman River, Little Qualicum River, Millstone River, Nanaimo River or French Creek; or
- within fifteen (15) metres from the Natural Boundary of any other Watercourse including a lake, marsh, or pond;

is designated as floodplain. These areas have been identified based on their susceptibility to "experience periodic flooding from nearby rivers, lakes, and streams" (Government of British Columbia, n.d.-e, para. 1).

With urbanization and a projected 12% increase in population over the next decade, the region has the potential for altering the risk of fluvial floods. River morphology and dynamics are influenced by their neighboring environment, which supplies water and sediment (Ashmore &

Table 13 – Rivers, lakes, and streams within the region

RIVERS	LAKES	STREAMS
Englishman River	Beck Lake	Beck Creek
Little Qualicum River	Cameron Lake	Bonnell Creek
Millstone River	Dolphin Lake	Chase River
Nanaimo River	Enos Lake	French Creek
Qualicum River	Hoggan Lake	Grandon Creek
	Holden Lake	Haslam Creek
	Horne Lake	Jump Creek
	Nanaimo Lakes	Kinkade Creek
	Quennell Lake	Morningstar Cr.
	Spider Lake	Morrison Creek
		Nile Creek
		Thames Creek
		Whiskey Creek

Church, 2001). As such, development and altered land use can contribute to the risk of fluvial floods; with varying impacts on different water bodies.

Flooding in most areas of Canada typically occurs in the spring months due to freshet where melting snow and ice increases the water levels in lakes, rivers or streams (Weston, Guthrie, & McTaggart-Cowan, 2003). Along BC's west coast however, it is more common for floods to occur during the fall and winter as a result of severe rainstorms or rain-on-snow events (Weston, et. al, 2003). With global temperatures rising due to climate change, rainfall and storm events are anticipated to increase in severity and frequency, which will have a cascading effect to river and streamflow regimes that may elevate the potential for fluvial floods over time (Ashmore & Church, 2001).

A study published in 2003 predicted a climate change induced shift in the flood regime of the Englishman River. Peak annual flows for the river were predicted to be 8% larger by 2020, 14% larger by 2050 and 17% larger by 2080 (Weston, et. al, 2003, p. 657). The study stated that during rainfall events, the Englishman River is very responsive to rain and snowmelt; its flow increases rapidly during the event but will also decrease rapidly once the rainfall ends (Weston, et. al, 2003). The 'flashy' nature of the river combined with a predicted increase in flood frequency and magnitude presents an increased risk of severe flooding with rapid onset for those living on the floodplain.

Rivers, Lakes, and Stream Flooding

A type of flooding resulting from the overflow of natural lake shorelines or water from a stream or river channel onto normally dry land in the floodplain adjacent to the channel (Integrated Research on Disaster Risk, 2014, p. 16).

These floods can be caused by intense rainfall, rapid snowmelt (including freshet events), and ice jams blocking the rivers.

Freshet: *The movement of water associated with the thawing of ice and snow each spring. This runoff can result in high water levels in streams, lakes and other waterways* (Abbott & Chapman, 2018, p. 17).

Ice Jams: *The accumulation of floating ice restricting or blocking a river's flow and drainage. Ice jams tend to develop near river bends and obstructions (e.g., bridges)* (Integrated Research on Disaster Risk, 2014, p. 15).

COASTAL FLOODING

	HAZARD	LIKELIHOOD		HUMAN & SOCIAL IMPACTS	PHYSICAL & ECONOMIC IMPACTS		RISK
	Coastal Flooding	5	x	(10	+ 12)	=	110

Coastal flooding is defined as higher-than-normal water levels along the coast caused by tidal changes or thunderstorms that result in flooding (Integrated Research on Disaster Risk, 2014, p. 13). High winds from tropical cyclones or other storms push water onshore to create a storm surge, which is the leading cause of coastal flooding. Coastal flooding can be amplified or dampened by tides (both daily tides and periodic king tides) (Resource and Environment Working, n.d., p. 7).

The region has an extensive (188 km) coastline encompassing portions of Electoral Areas A, B, E, G, and H, the Town of Qualicum Beach, the City of Parksville, the District of Lantzville, and the City of Nanaimo, as well as portions of land under the jurisdiction of the Qualicum First Nation, Snaw-Naw-As (Nanoose) First Nation, and the Snuneymuxw First Nation.

Globally, coastal regions typically have the highest density of population and are experiencing rapid growth in both residential and infrastructure developments, as well as expanding economic and tourist activities (Ranasinghe & Jongejan, 2018). This trend is reflected locally, with the coastal areas of the region holding the highest concentration of the population, government infrastructure, and the highest value properties in the region. Within the region, the coastal areas with the highest density of population and infrastructure include the Town of Qualicum Beach and City of Parksville (Houston, et al. 2011, p. 11). With a higher degree of exposure to instances of coastal flooding, these areas possess a greater risk to the impacts of such an event.

Climate change is a probable contributor to the occurrence of coastal flooding. Temperature increase affects sea level rise and causes "thermal expansion of the oceans and melting of glaciers, ice caps, and ice sheets" (Shaw, Taylor, Solomon, Christian, & Forbes, 1998, p. 365). It is projected the waters along Vancouver Island's east coast will rise by a minimum of 0.8m by the year 2100 (Regional District of Nanaimo, 2019b), and that coastal regions will not only be affected by rising sea levels, but also storm surges, wave conditions and river flow (Ranasinghe & Jongejan, 2018). As these levels continue to increase, coastal communities that are extremely low-lying may be at risk of consistent flooding (Regional District of Nanaimo, 2017a). Furthermore, the frequency of king tides is predicted to increase in the coming years due to the effects of climate change (Hernandez, 2018). While king tides alone can reach as high as five

meters in elevation, the flooding risk and potential impacts are heightened if the king tide occurs in combination with a storm surge (Little, 2018).

As communities continue to occupy and use coastal regions, risks associated with coastal flooding will remain and flood events will likely become a more frequent occurrence (Ranasinghe & Jongejan, 2018).

Coastal Flooding

Higher-than-normal water levels along the coast caused by tidal changes or thunderstorms that result in flooding, which can last from days to weeks (Integrated Research on Disaster Risk, 2014, p. 13).

High winds from tropical cyclones or other storms push water onshore to create a storm surge, which is the leading cause of coastal flooding and represents the greatest threat associated with such storms. Coastal flooding can be amplified or dampened by tides, both daily tides and periodic king tides, which are much larger tides that occur monthly or yearly due to the interaction of the earth, moon, and sun in their orbits (Resource and Environment Working, n.d., p. 7).

Storm Surge: *A storm surge consists of very high waves and high water levels caused by the wind and air pressure "pushing" the water onto the shore, often resulting in high waves and flooding. Storm surge can occur along all coastal areas of Canada. It can also occur in large lakes, such as the Great Lakes* (Public Safety Canada, 2018c).

King Tide: *King Tides (also known as perigean spring tides) are extreme high tide events that occur when the sun and moon's gravitation forces reinforce one another at times of the year when the moon is closest to the earth. They happen twice a year but are typically more dramatic during the winter* (Government of British Columbia, 2015, para. 1).

Flooding in the Region

Several notable flood incidents have occurred within the region. Researching these events helped shape the understanding of the flood hazards and their actual and potential impacts. During the engagement sessions, participants shared their most memorable hazard experiences, of which several related to historic floods in the region, e.g.:

"In 1997, a severe coastal rainfall event resulted in a record flow in Nash creek near Qualicum Bay. The overbank flow caused bank erosion and resulted in one house being undermined and the structure collapsed and was washed out to sea. Neighboring properties were also damaged and the RDN/MOE and EMBC constructed flood protection worked to stabilize the properties." – Representative from the Provincial Diking Authority

"In 2007, after a lengthy period of abnormally warm temperatures, the above average snow-pack created significant snow melt runoff into the Nanaimo River. The river rose to flood stage overnight and approximately 60 residents awoke to their homes being flooded. The North Cedar Fire Department, Cranberry Fire Department, BC Ambulance Service, Nanaimo Search & Rescue, the RDN, and the contractor for Ministry of Transportation & Infrastructure met at Unified Command to affect the rescue of the flooded persons. Once rescue was completed, evacuees were cared for and processed by the RDN Emergency Social Services (ESS) for food and lodging until flood waters receded." – Representative from the North Cedar Fire Department

Englishman River

As stated previously, the Englishman River near Parksville is one of the major floodplains within the region and has a history of annual flooding (Regional District of Nanaimo, 2007). In January 2018, heavy rainfall caused the river to flood, impacting Parry's RV Park. Twenty-two residents were evacuated from the area, extensive damage was caused to the park entrance, and many homes were uninhabitable for days because the water and wastewater system in the park was affected by the flood (Stoltz, 2018).

The owners and residents of Parry's RV Park are familiar with the impacts of flooding from the Englishman River. In April 2016, Parry's RV Park was placed on a state of local emergency after the river exceeded its banks. Similarly, in December 2014 the river flooded after an earthen berm failed to redirect river flow, and the community was set to a state of local emergency with a subsequent evacuation of the RV park (Regional District of Nanaimo, 2015). This event also resulted in flooding across Martindale Road which limited access to and from the RV Park. This event resulted in 12 people and their pets being evacuated, 7 of whom required 72-hour recovery services.

Martindale Road in Parksville also experiences flooding regularly. In early 2019, the Englishman River again flooded following heavy rains which led to the road being flooded near Highway 19A (Kveton, 2019).

There are also several more historic examples of the Englishman River flooding. For example, in the winter of 1949, the Englishman River flooded causing three homes in the area to be isolated (Septer, n. d.). Documentation indicates that the river flooded two further times in the subsequent months.

Nanaimo River

The Nanaimo River floodplain has been designated by the Government of BC as a “high risk” floodplain (Regional District of Nanaimo, 2018c). The river has a long-standing history of flooding. In the December of 1949, winter storms caused the Nanaimo River to flood causing significant damage to property (Septer, n. d.). In the winter of 2007, the river flooded near Wilkinson and Alice Road. Initially, the RDN was alerted to a resident who was trapped in a mobile home and could not get out due to increasing waters levels (Regional District of Nanaimo, 2008). A few hours later, a full evacuation was issued for Wilkinson, Alice, and Aros Roads.

More recently, in 2014, a period of severe weather caused the river to breach its banks resulting in minor flooding. Nearby communities were placed on an evacuation alert; however, the event did not escalate further (Regional District of Nanaimo, 2014).

Little Qualicum River

Flooding is also not uncommon along the Little Qualicum River. In December 2014, the Little Qualicum River flooded Cedar Grove Campground near Riverbend Road following the failure of an earthen berm (Regional District of Nanaimo, 2015). The flood water impacted transportation routes and required the Regional District of Nanaimo to declare a state of local emergency and issue an evacuation order. A total of 17 people, some accompanied by pets, were evacuated from the campground. Of those evacuated, 12 evacuees received 72-hour recovery support services. The heavy rain led to the evacuation of 15 homes in a neighbouring community, with another 70 homes being placed on an evacuation alert (The Canadian Press, 2014).

More historically, in October of 1921, the Little Qualicum River breached its banks following intense rains. The flood caused damage to nearby roads and led to a travel advisory for the public (Septer, n. d.).

French Creek

French Creek has a long-reported history of flooding, especially near River Crescent, Mason Trail and Lee Road, as well as near Grafton Road (BC Ministry of Environment and Climate Change, 2002). In November 2017, heavy rainfall caused French Creek to breach its banks and floodwaters damaged neighbouring homes (CTV News Vancouver Island, 2017). Flooding of French Creek into River Crescent occurred in 2005 and has also occurred more recently.

Flood Consequences

The impacts of major floods can be devastating, ranging from property damage and population displacement, to the damage and destruction of environmental and cultural resources (Regional District of Nanaimo, 2019b).

It was noted previously that flood, as a single hazard, is considered the most economically impactful hazard event for Canadians with respect to property damage (Public Safety Canada, 2015c). As evidenced by the 2013 Alberta flood, with an estimated \$6 billion sustained in financial losses and property damage, flood events can cost billions of dollars (The City of Calgary, 2018). While flood insurance helps to reduce the financial burden, if homeowners or businesses have restricted, or no flood insurance coverage, it may be impossible to fully recover costs (Moudrak, et. al, 2018). The economic impacts of a flood event can place a significant strain on the ability of communities and families to recover from an incident.

Flood events leave a lasting impression on those who experience their impacts. During the engagement sessions for the project, the flooding of Whiskey Creek in 2018 was mentioned by multiple participants.

“The Coombs Fire Department responded to a flooding event affecting 40 homes around Whiskey Creek. A blocked culvert under the railway was identified as one of the contributory factors and has since been cleared out. The biggest challenge facing the response team was logistics and the one of the challenges and ultimate successes was the delivery of pizzas over a foot bridge.” – Coombs Fire Department

Flood incidents have the potential to cause psychological impacts, as well as support system impacts, leading to stress among those who are involved and those trying to help others cope. Following the 2013 Alberta flood, researcher Dr. Caroline McDonald-Harker conducted a study focusing on the families from one of the most significantly impacted communities, High River. In an interview, it was noted that “over half of the families [were] still suffering with some long-term effects, whether that be post-traumatic stress disorder, depression or anxiety” (CBC News, 2018, para. 4). Other studies show individuals involved in a natural disaster can still experience psychological impacts 10 years following an incident, which can place tension on relationships (CBC News, 2018).

Flood damage can pose extreme risks to residents returning home once flood waters have receded. Water impacts the structural integrity of homes and buildings, causing walls or floors to buckle and supports to weaken. Contamination from sewage and other pollutants pose a serious health hazard, as do moulds which thrive in damp conditions. For residents who rely on well-water, drinking water may be contaminated following a flood and require disinfecting (EMBC, 2015).

Flood events also have the potential to generate large quantities of debris and waste, which in turn can negatively impact recovery and re-entry efforts (BC Ministry of Environment and

Climate Change Strategy, 2018). The City of Grand Forks, in the interior of BC, experienced catastrophic flooding in May 2018 following a period of intense rainfall combined with runoff from an above-average snowpack. In total, 417 homes were damaged by floodwater in the Kootenay Boundary Regional District alone, with estimates of 67,000 cubic meters of waste generated. Debris ranged from soggy drywall and flooring, to fridges and freezers full of rotting meat, requiring significant clean up and management efforts on the part of residents, businesses, and local governments (Laanela & Keating, 2018).

While not within the Regional District of Nanaimo, the nearby City of Courtney experienced serious floods in 2009, 2010, and again in December 2014, when extreme rainfall (>180 mm in 48 hours) led to road closures and traffic delays, and flooding in homes and businesses. Approximately 15,000 Island customers were without power due to the winds accompanying the storm knocking trees onto power lines. Flooding delayed the response of BC Hydro crews due to road closures and the need to take detours to conduct repairs in affected areas. Similarly, the Cowichan Valley and City of Duncan experienced major flooding in 2007. An engagement session participant shared the impacts of this flood event:

"In November 2007, a major flooding event occurred in the Cowichan Valley including the City of Duncan. There was no loss of life, however, more than 300 homes and 1,000 residents were evacuated and almost 50 homes flooded. Utilities, gas and electricity were off, residents were warned in advance. While the flooding lasted about 4-6 weeks, restoration went on for upwards of 6 months before residents were able to return home. The event was generally caused by snow melt, excessive rain and higher than usual tides. An EOC was activated for the region and emergency services provided support for residents of the region."
– Technical Safety BC representative

WIND EVENT

HAZARD		LIKELIHOOD		HUMAN & SOCIAL IMPACTS	PHYSICAL & ECONOMIC IMPACTS	RISK
	Wind Event	4	x	(16	+ 19)	= 140

Windstorms are a common seasonal phenomenon in southwest BC (Read, 2015). In the fall and winter months, extratropical cyclones frequently pass over Vancouver Island bringing strong winds (Read, 2016). While the east coast of Vancouver Island is largely protected from these weather systems by the range of mountains which run the length of the island (the Vancouver Island Ranges), high wind events in the region are not uncommon.

Strong winds can topple trees, destroy structures, and disrupt power grids as evidenced by the windstorm which struck southwest British Columbia on December 20, 2018. This storm saw record-breaking sustained wind speeds of 85 km/hr recorded at the Nanaimo Airport, left over 750,000 BC Hydro customers without power and damaged or destroyed thousands of pieces of equipment – making it the most damaging storm in BC Hydro’s history. Over 80% of electric customers (>350,000 customers) on Vancouver Island and the Gulf Islands lost power and many were subject to lengthy outages due to downed trees blocking crew’s access to complete repairs (BC Hydro, 2019a). The communities of Gabriola Island (Electoral Area B), Cedar, and Yellow Point (Electoral Area A) were particularly hard hit, suffering extensive power infrastructure damage (Bush C. , 2018).

The windstorm highlighted the vulnerable nature of communities with limited connector routes or bypasses. With debris, downed trees, and fallen power lines blocking roads and traffic signals out in many places across the region, there were significant delays in travel time (Huffman, 2018). Transportation between Vancouver Island and the mainland was also disrupted with multiple ferry sailings cancelled or delayed during the windstorm.

Windstorms can also impact water infrastructure as shown by the disruptions that affected more than 100,000 people in nearby communities. In Nanaimo, residents were asked to conserve water for emergency use only as power outages impacted the ability of the South Fork Road Water Treatment Plant to produce drinking water (Bush C. , 2018). Meanwhile, on Salt Spring Island, water service to some areas was disrupted after downed trees damaged infrastructure (Bush C. , 2018).

The downing of trees and power lines during a windstorm can also threaten the health and safety of community members more directly. In the community of Duncan, just south of the region, one woman was killed, and two other people injured after a tree fell on their tent during

the December 2018 windstorm (Judd & Schintz, 2018). Downed power lines also present a severe hazard of electrical shock or fire to people or things too close to the power line.

The frequency and intensity of wind events is expected to increase as the climate warms. Indeed, a recent report from BC Hydro (2018) indicates that there has already been a noted increase in both the recurrence and severity of storms and extreme weather events. These stronger, more frequent wind events will likely cause considerable damage to infrastructure, properties, power lines, and trees resulting in increased social and economic costs to the region.

WIND EVENT

Differences in air pressure resulting in the horizontal motion of air. The greater the difference in pressure, the stronger the wind. Wind moves from high pressure toward low pressure (Integrated Research on Disaster Risk, 2014, p. 18).

A wind warning is issued when there is “70 km/h or more sustained wind; and/or gusts to 90 km/h or more (Environment and Climate Change Canada, 2019b).

DROUGHT

HAZARD		LIKELIHOOD		HUMAN & SOCIAL IMPACTS	PHYSICAL & ECONOMIC IMPACTS	RISK
	Drought Event	5	x	(12	+ 16)	= 140

Water is a commodity that society has a critical dependence on; it is vital to sustain life, and to support ecosystems, agriculture, and the economy.

Approximately 64,000 residents in the region across all electoral areas and municipalities (excluding the City of Nanaimo) rely on groundwater for their water supply. In addition, many of the streams in the region rely on groundwater for base flow in the summer, which is essential to support aquatic life and habitat.

Although drought is more typical of drier areas (Natural Resources Canada, 2019b), BC's west coast is no exception and, in fact, may become more prone to the impacts of seasonal droughts in the future (Natural Resources Canada, 2019a).

Droughts can have varying impacts to society and the environment. Concerns include limitations to residential and commercial water supply (including drinking water supply); negative impacts to the agricultural industry due to early crop development; a lack of water to support crops and livestock and reduced groundwater levels resulting in decreased streamflow, warming river water, and impacts to aquatic and other wildlife.

In 2018, Vancouver Island, along with other regions of BC, experienced unparalleled heat triggering a level 4 drought (CTV News Vancouver Island, 2018). A level 4 drought is the most severe drought classification, indicating water supply is insufficient to meet socio-economic and ecosystem needs (see [Figure 11](#)) (Government of British Columbia, n.d.-c). Residents were encouraged to conserve as much water as possible in an effort to counteract the impacts of the drought (Crescenzi, 2018). This event contributed to several environmental impacts, including the ongoing elevated wildfire conditions, as well as record low flows for streams and tributaries, impacting aquatic life such as fish (Crescenzi, 2018).

The years 2014 through 2016 saw worrying drought conditions brought on by a combination of drivers including low snowpack, warmer than normal spring and summer air temperatures, and low spring and summer precipitation (Boon, 2016). As a result, the recreational fishery was closed for all three summers to protect the fish population, and efforts were made to capture Chinook salmon and truck them upstream to deeper, cooler spawning areas.

Figure 11 – Drought classification levels (Government of BC, n.d.)

LEVEL	CONDITIONS	SIGNIFICANCE	OBJECTIVE
1 (Green)	Normal Conditions	There is sufficient water to meet human and ecosystem needs	Preparedness
2 (Yellow)	Dry Conditions	First indications of a potential water supply problem	Voluntary conservation
3 (Orange)	Very Dry Conditions	Potentially serious ecosystem or socio-economic impacts possible	Voluntary conservation and restrictions
4 (Red)	Extremely Dry Conditions	Water supply insufficient to meet socio-economic and ecosystem needs	Voluntary conservation, restrictions and regulatory action as necessary

In 2015, the *Provincial Water Resource Management Branch* rated Vancouver Island as being at a Level 4 drought from July 3rd to September 3rd. During the summer of 2016, water was trucked-in, from external sources, when local residents' wells went dry and BC Hydro reduced north Island power generation to 15 per cent capacity, as flow in the Puntledge River was too low to activate their turbines (Boon, 2016).

With the region's significant dependence on tourism, droughts also have the potential to affect the region's economy and reputation. Tofino, another popular tourist destination on Vancouver Island, experienced a major water shortage in 2006 and had to rely on a backup reservoir (CBC News, 2006). With orders to conserve water, local businesses were forced to close and turn customers away.

With the effects of climate change, drought events are becoming increasingly common. The BC Government (n.d.) projects that with increasing temperatures, by the year 2050, droughts will become more severe and occur more frequently. The potential effects of climate change on drought were discussed during the HRVA engagement process. Participants agreed that the risk of decreased snowpack leading to less water supply for rivers and streams, will likely contribute to drought conditions in the future). In addition, engagement participants (2018–2019) shared details of long-term cascading effects of drought such as the risk of trees drying out, ultimately becoming more vulnerable to strong winds in the fall and winter months, and the risk of being uprooted and falling. These conditions could pose a serious risk to safety and result in power outages in the region in the event of a windstorm.

DROUGHT

Drought is a recurrent feature of climate involving a deficiency of precipitation over an extended period, resulting in a water shortage for activities, communities or aquatic ecosystems. In British Columbia (BC), combinations of insufficient snow accumulation, hot and dry weather, or a delay in rainfall may cause drought (Government of British Columbia, 2018, p. 1).

MOTOR VEHICLE INCIDENT

	HAZARD	LIKELIHOOD		HUMAN & SOCIAL IMPACTS	PHYSICAL & ECONOMIC IMPACTS		RISK
	Motor Vehicle Incident	4	x	(19	+ 12)	=	124

Motor vehicle incidents can occur anywhere, at any time, which makes them difficult to predict. Accidents can be caused by a number of behavioural factors including distracted driving, speeding, driving under the influence of drugs or alcohol, and high-risk driving (ICBC, 2019b). Other factors include road conditions (e.g. damages, lighting, layout, animal crossings etc.), weather conditions (e.g. rain, snow, ice, etc.), and level of driving experience (Aljanahi, Rhodes, & Metcalfe, 1999). Motor vehicle incidents can vary in severity from minor fender-benders, to incidents causing lengthy transportation interruptions, extensive property or infrastructure damage, or resulting in multiple fatalities

Within the region (excluding the City of Nanaimo), ICBC documented a total of 3,186 crashes between 2013 and 2017 (see [Table 14](#)⁷). Of those crashes, a total of 925 resulted in injury or fatality (ICBC, 2019a).

Serious incidents involving fatalities can have devastating impacts for the families and communities of those involved. This was the case in the April 2018 Humboldt Broncos bus crash in Saskatchewan. This tragic incident took 16 lives and left 13 people with injuries (Malone, 2019). The psychosocial impacts of this crash rippled through the small community, and many of the first responders involved have been receiving mental health support following the incident (Malone, 2019). Events such as the tragedy presented can affect entire communities with impacts that far outlast the initial crash.

Table 14 – Crash statistics for the region (2013 – 2017)

Source: (ICBC, 2019a)

Community	Total Crashes	Casualty Crashes
Bowser	56	11
Coombs	77	23
Errington	82	14
Gabriola Island	179	21
Lantzville	398	150
Nanoose Bay	362	92
Parksville	1,258	410
Qualicum Beach	774	204

Motor vehicle incidents also have the potential to cause damage to property including critical infrastructure and other buildings and structures. For example, in February 2019, a vehicle lost

⁷ (ICBC, 2019a) *Data was unavailable for all communities within the seven Electoral Areas of the Regional District of Nanaimo

control in Saanich and collided with a powerline pole, leaving over 2,300 customers without power (CTV News Vancouver Island, 2019b).

During the HRVA engagement process, participants discussed the potential impacts a motor vehicle incident could have in the region. Depending on the severity of the incident and technical requirements of an investigation or environmental clean-up requirements, major travel routes could be closed resulting in lengthy delays. Areas in the region without multiple or alternate access routes could be particularly vulnerable to traffic delays in the event of an accident. In cases where residents, businesses or industry are reliant on these transportation routes, this could also cause significant impacts on services and businesses overall. Constant disruptions can result in resident frustration and a desire for solutions, which, if it is not remedied, could place the region's reputation in to question as they may feel as though their concerns are not being addressed.

The potential impacts of traffic delays on Vancouver Island's tourist culture and the possible associated economic fallout was also discussed. Engagement participants expressed concern that tourists may decide to travel elsewhere to avoid regions that have a reputation of having difficult or regularly delayed travel routes which may, in turn, impact local business who rely on tourists for their income.

With a high percentage of senior residents and an aging population, the region has a large and growing population of people vulnerable to the impacts of a motor vehicle incident. The fatality rate for seniors involved in motor vehicle incidents far exceeds that of other age groups. Data obtained from Transport Canada revealed that from 2000 to 2015 more seniors died in traffic fatalities than in any other age group across Canada (Slaughter, 2018). Pre-existing health conditions and the diminished ability to withstand major trauma can make seniors more vulnerable to injury or death in a motor vehicle incident.

With the potential to damage property and infrastructure, as well as cause serious harm of fatality, motor vehicle incidents could greatly impact the region both social and economically. Additionally, the likelihood and/or consequences of motor vehicle incidents may also be affected by climate change in the future. Discussions during the engagement process (2018–2019) suggested that as weather events become more severe, driving conditions resulting from increased rain, wind, ice or snow can become increasingly hazardous and lead to more accidents.

Motor Vehicle Incident

An incident whenever a vehicle, be it a truck, passenger car, bus, farm vehicle or any other motor- or person-powered vehicle collides with another vehicle, train or other obstruction; or loses control and incurs damage (EMBC, 2019).

ELECTRICAL POWER OUTAGE

	HAZARD	LIKELIHOOD		HUMAN & SOCIAL IMPACTS	PHYSICAL & ECONOMIC IMPACTS		RISK
	Electrical Power Outage	5	x	(13	+ 11)	=	120

With the increasing reliance on electrical power, any disruption in power could pose a serious risk to local residents and critical infrastructure. Electricity on Vancouver Island is provided to homes and businesses primarily by BC Hydro through four hydroelectric systems with six generating facilities (BC Hydro, 2019b). These facilities span the island in geographical extent from Jordan River in the south, to the John Hart facility in Campbell River. However, there are no generating facilities located directly within the region (BC Hydro, 2019b).

BC's land cover makes it particularly vulnerable to outages due to falling trees, as the overhead power lines have three times more trees per kilometer than any other region in North America (BC Hydro, 2018). Power outages often follow severe weather events such as wind and snow (Government of British Columbia, n.d.-g). Other causes of outages include "motor vehicle accidents, vandalism, and birds and animals interfering with electrical equipment" (BC Hydro, 2019a, p. 4).

A loss of power can affect individuals by restricting access to resources such as light, heat, running water and even food depending on the length of the incident. Within BC specifically, electrical power outages due to severe weather such as wind storms are becoming increasingly more common. BC Hydro (2017) reports residents of Vancouver Island experience 2.16 outages per year, per person, of which 44% occur during the winter storm season from mid-October to mid-February. The largest outage on record occurred in 2015, when a windstorm led to almost half of BC Hydro's customers, approximately 710,000 people, losing power across Vancouver's Mainland and Vancouver Island (CBC News, 2015). In 2018, a similar event resulted in over 300,000 BC Hydro customers losing power (Wadhvani, 2018). Of those customers, 110,000 were Vancouver Island residents with 67,000 located in the southern region of Vancouver Island and 43,000 in the northern region (Wadhvani, 2018).

Following a power outage event, BC Hydro works to restore power as soon as possible. BC Hydro prioritizes safety and will address any immediate concerns such as downed lines first (BC Hydro, 2019a). Once safety concerns have been addressed, BC Hydro works to restore power to critical services (fire, hospital, etc.) and areas with high concentrations of customers (BC Hydro, 2019a). As such, those who reside in more remote or rural communities may be without power for longer periods of time and ultimately be more vulnerable to the impacts of the outage.

The power grid is considered to be critical infrastructure and failures have the potential to greatly affected not only residents directly but also other critical infrastructure. The August 2003 blackout on the east coast of Canada and the US provides an example of the significant dependencies the critical infrastructure sectors have on electrical power as detailed below (Public Safety Canada, 2006).

- **Communications** – telecommunication companies experienced complications and cellular providers experienced increased volumes of calls causing the system to be overloaded
- **Banking and Finance** – due to the substantial dependence on technology including computer networks, telecommunications and wireless technology, this sector experienced an immediate degradation of services
- **Food Distribution** – difficulties with shipping and storage of inventory resulted in spoilage of product
- **Water Treatment, Supply and Distribution** – water supply was satisfactory during the event; however, some water treatment plants were said to have released partially treated waste back into waterways
- **Manufacturing** – during the power outage, commercial and industrial businesses closed or scaled back their manufacturing to conserve power
- **Transportation** – power loss led to difficulty for commuters as traffic lights and other electrical signs lost power, in addition buses, airport and rail transportation were delayed
- **Safety**
 - o **Emergency Services** – received an increased number of calls and experienced transportation delays, along with communication difficulties and hospital delays
 - o **Environmental Services** – chemical plants informed there were hydrocarbons that had been released into the air and boil water advisories were put in place after the release of partially treated waste in waterways

In addition to the above noted impacts to critical infrastructure sectors, the 2003 outage also hindered the ability of the oil and gas sector to manufacture or transport its products, and had substantial economic impacts with an estimated 26.4 million hours of work lost (Public Safety Canada, 2006). It was also reported that businesses saw an economic loss due to having to close their business or due to a decrease in sales following the outage.

Within the region itself, there have been some notable impacts to critical infrastructure resulting from electrical power outages. For example, a water treatment plant located in Nanaimo failed due to power loss following the significant 2018 windstorm (Migdal, 2018). During this event, Nanaimo residents were requested to restrict their non-essential water use and local businesses, such as restaurants, had to adapt or limit their services to deal with the water shortage (Migdal, 2018).

As adverse or severe weather is the leading causes of power outages, climate change could lead to an increase in outages. According to a report released by BC Hydro (2018), the number of individual storm events they responded to in the province tripled between 2013 and 2017. BC

Hydro customer outages resulting from a storm increased approximately 265% during this period – from 323,000 customers in 2013 to 1.18 million in 2017. With a trend for more frequent and destructive wind events the frequency of electrical power outages is expected to increase.

Electrical Power Outage

A power outage is a short or long-term loss of electric power to an area (Government of British Columbia, n.d.-f).

STRUCTURE FIRE

HAZARD		LIKELIHOOD		HUMAN & SOCIAL IMPACTS	PHYSICAL & ECONOMIC IMPACTS	RISK
	Structure Fire	5	x	(14	+ 10)	= 120

Structure fires include those fires burning in industrial, commercial or residential structures. Such structures include factories, storage facilities, office buildings, homes, schools, hotels, and retail outlets. Most structure fires are accidental and can occur at any time. In 2014, the top causes of residential and commercial structure fires in British Columbia were cooking equipment, matches and lighters (not for smoking use), smoker's material, and electrical equipment (Acada Consulting Inc., 2018). In 2013, a total of 35 structure fires were reported to have occurred within the region (excluding Nanaimo), which resulted in losses over \$2.5 million (EMBC, 2013).

Structure fires can have different impacts due to the varying types of structures involved. Industrial and commercial fires can have serious implications for the community and tend to be more severe in nature than residential fires. These fires often result in significant costs to the companies involved, not only due to the damaged equipment, products or goods, and cost of repairs, but also the due to the lost revenue potential arising from lengthy closures and disruption of services. Depending on the recovery time, workers may experience impacts resulting from lost wages. Industrial fires can also pose complications for response and recovery due to the potential presence of hazardous materials and other on-site hazards.

In February 2019, a cement manufacturing facility located in Sooke, BC caught fire causing serious damage to the facility and the destruction of expensive equipment, with projected recovery costs of roughly half a million dollars (Gaetz, 2019). Because of the complex nature of the incident, mutual aid support was brought in from local fire detachments. The complexities included:

- Explosions,
- The presence of fuel and hydraulic fluids in the facility machinery,
- The involvement of heavy equipment,
- Compromised power lines, and
- Neighbouring trees on fire.

Residential fires have the potential to greatly impact individuals and families, destroying their belongings, leaving them without homes and in some cases, causing serious injury or fatality. A recent fire in an apartment building in Saanich, thought to have been caused by an electrical appliance failure, resulted in one fatality, two injuries and significant property damage from smoke and water (CTV News Vancouver Island, 2019a). Due to the extent of the damage,

residents from over thirty units were left temporarily homeless, requiring support from Emergency Support Services and other agencies.

An engagement session participant shared details of a structure fire which occurred in July 2018 on Mudge Island as their most memorable hazard experience. Due to the extreme fire hazard at the time, the fire spread to the nearby trees and took 35 community members and fire fighters with helicopters to extinguish the blaze. In January 2019, four people were displaced after a fire destroyed their home in Bowser leaving the residents with few of their belongings (Blats, 2019). With a range of consequences from fatalities to property damage, it is likely that all of these incidents resulted in psychosocial impacts to those affected.

Structure fires can also affect buildings of high cultural importance such as churches, heritage buildings, as well as sites and facilities which are culturally significant to the region's First Nations. A recent example was the April 2019 fire at Notre-Dame Cathedral in Paris, described as "invaluable heritage", which affected thousands of people around the world. Such sites are often important contributors to the local economy, drawing visitors and tourists to the area.

Although structure fires can impact anyone, certain populations are more vulnerable to their impacts. Seniors, young children (under six years of age), as well as individuals with socio-economic disadvantages are thought to be at a higher risk of death from smoke inhalation or carbon monoxide poisoning (Garis, Hugan, & McCormick, 2016). While seniors, and young children, may not hear or be equipped to react to a smoke alarm, those with socio-economic disadvantages are more likely to not have functioning detectors on premise, making them more susceptible to the risks of fire. With a greater proportion of seniors in the region compared to the province, there may be a greater risk of injuries or fatalities due to structure fires. Additionally, with the largest proportion of low-income households in the region, Electoral Areas B, F and H could also be at a higher risk of impacts from structure fires. Those living in rural areas may be more vulnerable as a result of their limited access to firefighting resources such as fire hydrants. In 2018 a residential fire located near the Town of Qualicum Beach occurred and firefighters had to depend on water-tender shuttles for water to fight the blaze as there were no fire hydrants near the premises (Nanaimo News Bulletin, 2018).

Engagement session participants noted that structure fires may increase in frequency or severity in the future as a result of climate change. Increased storm frequency may lead to more or longer power outages, which can contribute to sources of fire ignition in structures. Additionally, dryer, hotter weather could act as a catalyst to fuel structure fires, causing them to spread to surrounding areas and/or making them more difficult to fight.

Structure Fire

A fire burning in industrial, commercial, or residential structures. Includes, but is not limited to, fires burning in factories, storage facilities, office buildings, homes and apartment buildings, schools, hotels, and retail outlets.

HUMAN DISEASE

	HAZARD	LIKELIHOOD		HUMAN & SOCIAL IMPACTS	PHYSICAL & ECONOMIC IMPACTS		RISK
	Human Disease	3	x	(21	+ 12)	=	99

Human diseases are not new occurrences, however, with modern science and vaccines, they have become more preventable and manageable than they have been historically. Infectious human diseases spread via person to person contact, either directly or indirectly, and have the potential to lead to epidemics at the local level, and pandemics at the global level. Epidemics and pandemics can impact the functioning of critical infrastructure, businesses, and industry through above-normal employee absenteeism caused by the disease itself, caring for the ill, and/or by measures to contain the spread of the disease (quarantines, school and public building closures). Infectious human diseases can place extraordinary demands on the health care system and health care workers.

Infectious human diseases can originate from:

- Newly detected or unknown sources;
- Known sources that have spread to new populations and/or new geographic locations;
- Existing sources whose role in disease transmission was unknown in the past; and
- Infectious diseases once thought to have been eliminated and/or controlled but are now re-emerging.

Infectious human diseases cause serious illness and deaths every year. Although infectious diseases can affect anyone at any time, those with weak immune systems, those with pre-existing medical conditions, or those without access to appropriate vaccinations are particularly susceptible.

As a result of successful immunization, several diseases were considered 'diseases of the past'. However, with some people declining to be vaccinated, or have their children vaccinated, the risk of contracting or spreading many of these diseases has risen. Measles, for example, is considered to be rare disease within Canada due to the success of the existing measles vaccine (Health Link BC, 2019). However, as measles is still prevalent in other regions around the world, Canadians who are not vaccinated can still be susceptible to the disease if they are exposed to the virus.

Prior to the measles vaccination being introduced in 1960, approximately 300,000 to 400,000 Canadians were diagnosed with the disease each year. In 1926, nearly 900 Canadians succumbed to measles and those who survived were at risk of living with permanent health

complications, such as brain damage or loss of hearing (Government of Canada, 2019). In 2019, there were 29 patients in BC with confirmed measles diagnoses, eight of these cases were documented on Vancouver Island (Grossman, 2019). Though Canada's vaccination rate is high, the eight confirmed cases of measles that occurred on the Island were all associated with travel outside of the country and stresses the importance of vaccines as a tool to mitigate disease outbreaks.

Some other notable incidents of infectious human disease outbreak include:

- 1862 – Smallpox. Death toll in the thousands amongst BC's Indigenous population.
- 1918 to 1920 – Spanish Flu. 55,000 Canadians die. 4,000 in BC.
- 1957 to 1958 – Asian Flu. 2,000 Canadians die.
- 1968 to 1969 – Hong Kong Flu. 4,000 Canadians die.
- 2003 – SARS. 44 Canadians die.
- 2009 – H1N1. 428 Canadians die.

Human Disease

Diseases that are caused by pathogenic microorganisms and are spread directly, or indirectly, from one person to another.

Epidemic: *refers to an increase, often sudden, in the number of cases of a disease above what is normally expected in that population in that area* (Center for Disease Control and Prevention, 2012, para. 3).

Pandemic: *is the worldwide spread of a new disease. The total number of people who get severely ill can vary. However, the impact or severity tends to be higher in pandemics in part because of the much larger number of people in the population who lack pre-existing immunity to the new virus* (World Health Organization, 2010).

INTENTIONAL ACTS OF CBRNE

HAZARD		LIKELIHOOD		HUMAN & SOCIAL IMPACTS	PHYSICAL & ECONOMIC IMPACTS	RISK
	Intentional Acts of CBRNE	2	x	(18	+ 17)	= 70

CBRNE events are intentional criminal acts, often classified as acts of terrorism, involving chemical, biological, radiological, nuclear, or explosive materials. Public Safety Canada's (2019a) *2018 Public Report on the Terrorism Threat to Canada*, notes that Canada's National Terrorism Threat Level remains at medium (set early October 2014) – meaning a violent act of terrorism could occur. While the likelihood of a CBRNE event occurring is relatively low, the impacts such an event would have are significant.

An explosive CBRNE event is considered the most likely to occur due to the relative ease in producing an explosive device without specialized training and the abundance of materials to create one (Ontario Office of the Fire Marshal & Emergency Management, 2019). Chemical and biological agents require some degree of expertise due to the difficulty in dispersing them effectively. The least likely type of CBRNE event is a radiological or nuclear event. These events require a specialized device and a large amount of nuclear or radiological material.

The impact of a CBRNE event is dependent on a number of variables such as the type and quantity of material used, the delivery system and dispersal method, location, population density and exposure to the device contaminants, and environmental conditions at the time of the attack.

Consequences arising from a CBRNE event can include mass casualties, fatalities or illness; the need for a large medical response, decontamination systems and specialized medical intervention and equipment; negative psychosocial impacts and chronic health impacts for survivors (Ontario Office of the Fire Marshal & Emergency Management, 2019). Damage or other impacts to critical infrastructure, such as water, energy, and transportation can occur, as they are often the focus of the attack. Additionally, the creation of a hazardous environment associated with some CBRNE events, can influence not only the response but the recovery from a CBRNE event.

There has been a number of notable CBRNE events impacting infrastructure in Canada, primarily of an explosive nature. In May 1983, a bombing occurred damaging the Cheekeye-Dunsmuir Hydro substation on Vancouver Island which was under construction. The bombing was said to be the result activity by a radical environmental group, Direct Action, who were protesting the development of the substation (United Press International, 1982). The substation was near completion at the time of the attack; four transformers were significantly damaged, to a cost of

\$6 million dollars (United Press International, 1982). Following the incident, police speculated nearly 200lbs of dynamite had been secured to the four transformers (Campbell, 2000). There were no injuries or fatalities.

In another instance in British Columbia, six bombs were set off at various locations along the EnCanada Gas Pipeline over a ten-month period in 2008/2009, causing property damage but no injuries (CBC News, 2011).

The past decade has seen a slow but steady rise in the use of chemical agents to carry out attacks abroad (Public Safety Canada, 2019a), and there are several international examples of events involving explosives, from which impacts have been severe. Conflicts and the evolving global security environment continue to influence the risk of CBRNE events locally.

Intentional Acts of CBRNE

An event that involves a potential, perceived, or actual act with chemical or biological, radiological, nuclear or explosive materials that are, or are suspected to be, used in a deliberate or intentional way to cause harm (Public Safety Canada, 2015b).

ACTIVE THREAT

	HAZARD	LIKELIHOOD		HUMAN & SOCIAL IMPACTS	PHYSICAL & ECONOMIC IMPACTS		RISK
	Active Threat	2	x	(19	+ 14)	=	66

An active threat involves an individual who is actively killing or trying to kill people in an enclosed or populated area (U.S. Department of Homeland Security, 2008). While the likelihood of an active threat event occurring in the region is low, the consequences of such an event should it occur are very high. An active threat event can occur in a public area, or at locations specifically chosen for social, cultural, symbolic, or political significance (Ontario Office of the Fire Marshal & Emergency Management, 2019). Active threat events are typically dramatic, fear-provoking, and distressing for both those involved and those who observe the event, ultimately negatively impacting the social well-being of the entire community (Ontario Office of the Fire Marshal & Emergency Management, 2019).

Types of active threats may include:

- Active Shooter: an event involving multiple victims of firearms-related violence perpetrated by a single or multiple shooter;
- Vehicle Ramming Attack: an event where a perpetrator deliberately rams a motor vehicle into a building, crowd of people, or another vehicle;
- Stabbing Attack: an event where a perpetrator uses an edged weapon to deliberately harm people; and
- Improvised Explosive Device (IED): an event where a perpetrator makes a "homemade" bomb from non-conventional materials but excludes radiological or nuclear devices (Ontario Office of the Fire Marshal & Emergency Management, 2019, para. 13).

The types of weapons that are utilized in these types of situations are easy to acquire and thus challenging to prevent from being used for an active threat event (Ontario Office of the Fire Marshal & Emergency Management, 2019). Perpetrators of such events typically try to find 'soft targets' where people gather, generally with the goal of causing as much damage or injury as possible. Furthermore, active threat events typically progress rapidly and are therefore unpredictable with regard to who may be at risk. As such, active threat events are nearly impossible to defend against.

Possible impacts of an active threat event include:

- Human harm (psychological and/or physical) or fatality;
- Stress placed on support systems such as hospitals and emergency services;

-
- Missing persons;
 - Interruption in various sectors such as government, business or financial;
 - Individuals being displaced;
 - Damage to property such as buildings or critical infrastructure; and
 - Traffic delays (Ontario Office of the Fire Marshal & Emergency Management, 2019).

Locally, an active shooting took place in 2014 in a Nanaimo sawmill. A disgruntled former employee of the mill opened fire, killing two people and injuring two others who were taken to hospital with gunshot wounds (DeRosa, 2014). The victims, victim's families and mill employees were all offered counselling to support them as they processed the incident.

In April 2018, an active vehicle ramming event occurred in Toronto, Ontario, which resulted in 10 fatalities and 16 injuries (Westoll, 2019). Testimony from the victims, witnesses and families clearly express that this was an event that has changed their lives forever. The incident overwhelmed emergency services and healthcare facilities, and caused serious traffic disruptions in the city, with closures of several major roads and subway stations (Westoll, 2019).

Active threat events cause psychological and stress injuries, which can impact not only the responders and individuals directly involved with the incident, but others who hear about and see the incident through various media channels (Ontario Office of the Fire Marshal & Emergency Management, 2019).

It is evident through tragedies such as these that active threats have the potential for physical and psychological consequences, impacting those directly and indirectly involved. With the ease and accessibility of active threat weapons, it is likely these events will continue to occur; however, they will remain difficult to prepare for and thus will require a strong response and support services in the aftermath.

Active Threat

An active threat is when an individual is actively engaged in killing or attempting to kill people in a confined and populated area. This is inclusive of active shooters in both public and industrial spaces (U.S. Department of Homeland Security, 2008, p. 2).

MEGATHRUST EARTHQUAKE

HAZARD	LIKELIHOOD	HUMAN & SOCIAL IMPACTS	PHYSICAL & ECONOMIC IMPACTS	RISK
 Megathrust Earthquake	1	x (30 + 25)	=	55

Despite having a low frequency of occurrence, the megathrust earthquake hazard event was assigned the highest possible score for potential consequence. When a megathrust earthquake hits western Canada, it is expected to impact all communities within the region.

Megathrust earthquakes are huge “subduction” earthquakes that occur when the build-up of strain between two tectonic plates, one of which is being thrust under the other, is suddenly released (Natural Resources Canada, 2019). The subduction zone that would specifically affect the region is the Cascadia subduction zone which is found off the west coast of Vancouver Island and extends seven hundred miles south along the Pacific Northwest coast to California. Within the Cascadia subduction zone is the Juan de Fuca Plate and the North American Plate. The much smaller Juan de Fuca Plate is subducting underneath the much larger North American Plate, causing both plates to constantly converge. Due to the growing tension and friction where the plates are “stuck” together, when released, the result will be a megathrust earthquake.

Results of extensive research, including analysis of geological evidence, have revealed that the Pacific Northwest has experienced 41 subduction zone earthquakes in the past 10,000 years – a recurrence interval of 243 years (Schulz, 2015). Experts state there is a 12 per cent probability a Cascadia megathrust earthquake will occur in the next 50 years (Dangerfield, 2018). The last megathrust earthquake along the Cascadia subduction zone occurred on January 26, 1700. The earthquake caused intense shaking and also resulted in a massive tsunami that swept west, across the Pacific Ocean (Natural Resources Canada, 2019c). Oral history from the First Nations people of Vancouver Island noted that as a result of the shaking, houses belonging to the Cowichan people collapsed and several landslides were triggered. The effects of the shaking have been described as extremely intense and for such a lengthy period of time that people could not stand and felt sick as a result.

It is predicted that a megathrust earthquake will cause damage to buildings, infrastructure, and the environment, which will result in people being trapped, killed or injured from falling debris and associated secondary hazards such as tsunami, landslides or fires. Experts in B.C. and the U.S. estimate that the number of deaths could reach 10,000 with another 26,000 injured across the Cascadia subduction zone (Schulz, 2015). After the initial megathrust earthquake, additional casualties may occur from aftershocks or secondary hazards.

A study conducted by The Conference Board of Canada, which focused on the economic impacts 10 years after a significant earthquake occurred off the coast of BC, reported there are significant economic risks associated with disastrous events such as the megathrust earthquake (McIntyre & Desormeaux, 2016). Any impacts to the economy could directly affect both the efforts to rebuild and recover from a catastrophic incident; much of it being borne by the taxpayer, both for infrastructure/assets as well as some private losses (McIntyre & Desormeaux, 2016). This in turn can place significant stress on individuals and communities as they seek support to both overcome and move forward from the aftermath of a megathrust earthquake.

Due to the significant magnitude of a megathrust earthquake, the potential consequences to critical infrastructure would be unprecedented. Professor Saeed Mirza suggests, the current state of Canada's critical infrastructure is "very dire" (Kovacs, 2010, p. 17). Based on megathrust earthquakes that have occurred in other regions around the world, there are some ideas of what these consequences might be, as detailed below (Kovacs, 2010).

- **Electrical power and communication services** – due to the size and potential impact zone of a megathrust earthquake occurring in the Cascadia subduction zone, electric and communication infrastructure are expected to be compromised, not just locally on Vancouver Island but also extending into Vancouver's mainland and the United States. This would greatly restrict the accessibility of neighboring resources that contribute to bringing infrastructure and services back on line as quickly as possible. A prolonged lack of power and/or communication services has the potential to significantly impact a community's ability to recover.
- **Transportation** – a megathrust earthquake would result in serious interruptions to transportation services, with the potential to last for several weeks or even months. Within the region, transportation infrastructure at risk includes roads, bridges, ports, and airports. If significant damage to this infrastructure were to occur, the region would be extremely vulnerable as the provision of critical resources to enable the region and communities to recover, would be limited.
- **Water and underground utilities** – if underground utilities such as sewers and water lines are impacted, it is probable there would be extensive failure. This could lead to sewage back up, contamination of groundwater, and coupled with limited water availability, could result in a sizeable evacuation as communities are forced to relocate. Not only would a loss of water directly impact individuals as a critical resource to sustain life, but there is the potential that fires will result as a secondary hazard to the earthquake. Without the necessary water supply to contain these fires, further damage and lives could be put at risk.

Strong inter-dependencies between the various critical infrastructure sectors mean impacts to one sector may have cascading effects. Additionally, different levels of government and public and private agencies have responsibility over various critical infrastructure and assets, making the efforts to plan for, and respond to, significant earthquakes challenging. A coordinated

approach to mitigation, preparedness, response and recovery will be essential to manage the risk.

Due to the scale of the megathrust earthquake that is likely to occur in the Cascadia subduction zone, it is certain there will be tremendous consequences directly impacting the physical and mental health of communities, critical infrastructure, the economy, the environment along with emergency and support services.

Megathrust Earthquake

A megathrust earthquake is a very large earthquake that occurs in a subduction zone, a region where one of the earth's tectonic plates is thrust under another. For the purposes of this definition, megathrust earthquakes have a magnitude of 8.5 or greater (Natural Resources Canada, 2019c).

09 Resiliency

Both vulnerability and resiliency are important, and closely related, concepts for evaluating a community's ability to cope with the impacts of a hazard event. While vulnerability looks at the factors that increase a community's susceptibility to damage from a hazard, resiliency is a measure of a community's ability to resist or recover from damage (SOPAC, 2002). Typically, the most vulnerable communities tend to be the least resilient (Bergstrand, Mayer, & Zhang, 2015).

UN Office for Disaster Risk Reduction (UNDRR) defines resilience as:

"The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management."

(UN Office for Disaster Risk Reduction, 2017).

Just as social systems play a key role in human vulnerability to hazards, social systems also underpin many aspects of community resilience (Bergstrand, Mayer, & Zhang, 2015). Paton and Johnston (2001) identified a sense of community, or feelings of belonging, as being an important component of a community's ability to "bounce back".

The sense of connectedness and strong support networks in the region were highlighted by engagement session participants as an important aspect of current resiliency levels within the region. This sense of belonging was also emphasized by the results of the 2015–16 Canadian Community Health Survey (Provincial Health Services Authority, 2019). Almost three-quarters of the Central Vancouver Island HSDA⁸ population (aged 12 and up) reported a somewhat strong or very strong sense of belonging to their local community. This sense of belonging may increase resident's involvement in community disaster response strategies (Bergstrand, Mayer, & Zhang, 2015). Several engagement session participants commented on the willingness of community members to collaborate on emergency preparedness initiatives across communities and organizations/agencies and their interest in taking a proactive approach.

Efforts to build resiliency and recovery capacity are most effective when undertaken at the regional and community level. Engagement session participants were asked to share their knowledge of current strategies that are contributing to resiliency within the region. These community and regional resiliency strategies were taken into consideration by the project team during the hazard consequence rating portion of this assessment.

⁸ The Regional District of Nanaimo is included in the Central Vancouver Island Health Service Delivery Area (HSDA) along with the Alberni-Clayquot and Cowichan Valley regional districts

A selection of current resilience resources and strategies are captured below, grouped under the themes of “Prevention & Mitigation Activities” and “Preparedness & Response Resources”:

PREVENTION & MITIGATION ACTIVITIES

Non-Structural Mitigation

i.e. Strategies for encouraging safer and more sustainable development.

- Strategic Plans:
 - o *City of Parksville 2019–2022 Strategic Plan* – includes actions for providing diverse housing options and development, support improved access to health care, and economic development.
 - o *Town of Qualicum Beach 2019–2022 Strategic Plan* – includes actions for supporting a diversity of housing, implementing the Town’s Official Community Plan, improve transportation networks, and enhance alternative opportunities, and fostering economic opportunities.
 - o *RDN 2019–2022 Strategic Plan* – includes actions for climate change adaptation and mitigation, affordable housing, asset management, and economic diversification.
 - o The *Regional Growth Strategy* (RGS) – adopted by the RDN in 2011, it sets out a long-term strategic plan for sustainable population growth and development.
 - o Official Community Plans (OCPs) – long-term strategies for land use, development, and servicing adopted by Electoral Areas and Municipalities within the region. The OCPs align with the goals of the RGS and are implemented primarily through zoning bylaws.
- Asset management programs to replace aging and existing infrastructure:
 - o *RDN Asset Management Review and Implementation Report* (2019) – recently produced with a plan to develop an overall *Asset Management Plan Implementation Framework* in 2020 to operationalize the RDN’s asset management program.
 - o The Town of Qualicum Beach has been in the process of developing a comprehensive asset management program since 2015.
 - o The City of Parksville is currently working towards the adoption of an Asset Management Strategy.
- *RDN Sea Level Rise Adaptation Program* – The RDN recently commenced the first phase of an assessment of coastal areas that may be impacted by sea level rise within the Electoral Areas, Parksville and Lantzville. When complete, the entire coastal region from Electoral Area ‘H’ to ‘A’, including Area ‘B’ and member municipalities will have floodplain mapping, which will be used to better inform decision-making.

- Floodplain Management Bylaw (No. 1469) – Applies within the boundaries of the Regional District of Nanaimo Electoral Areas A, C, E, F, G and H. Bylaw updated December 2018 to incorporate sea level rise.
- Parksville Development Permit Areas (DPAs) – DPAs have been established for the City of Parksville to manage the development in hazardous areas, e.g. DPA No. 10 – Wildfire Interface Management Area, DPA No. 11 – Coastal Protection Development Area, and DPA No. 12 – Flood Plan Development Area.
- *Drinking Water and Watershed Protection (DWWP) Action Plan* – details regional initiatives to protect watersheds and drinking water. 10-year Plan updated in 2019.
- *Qualicum Beach Waterfront Master Plan* (2016) which includes goals for establishing a beach profile that will protect against future damage.

Structural Mitigation

i.e. Strategies for preventing damage to infrastructure and homes.

- Fire mitigation strategies to increase resilience in buildings in interface zone (FireSmart design standards). FireSmart infrastructure to provide safe access routes and adequate water supply for firefighting.
- Enforcing building codes.
- Stormwater mitigation features, e.g. storm sewers, culverts, ditches, overland flow on roadways, streams.
- Green infrastructure, e.g. bioswales, rainwater ponds, rain gardens, top soil retention, pervious pavers, to maintain hydrological function and resiliency.
- Dike mitigation to reduce flooding.
- Sandbag stocks around region.
- Improved existing dam infrastructure with new spillway. Fire suppression readiness – Initiatives underway to increase availability and maintenance of interface firewater and storage tanks to provide water sources closer to fire risk areas and provide enhanced fire protection. Preparedness & Response Resources

Education and Training

i.e. Strategies for enhancing public awareness and capabilities of response personnel.

- Emergency Preparedness Expo – Workshops and activities offered for residents to help improve preparedness and response
- Public presentations and other community outreach workshops
- Neighbourhood Emergency Preparedness Program (NEPP) – program designed to build neighbourhood level resiliency.
- Social media strategy – usage is being increased to deliver public education.
- Webpage developed for Emergency Preparedness
- Completion and dissemination of HRVA. Improved awareness of hazards within the region through engagement sessions and communication of report findings.

- FireSmart Communities Program and FireSmart Home Assessments – recommendations for property owners on how to mitigate fire hazards and implementing solutions for wildfire safety.

Emergency Response

i.e. Strategies for increasing response capacity and coordination.

- Emergency Plans – facilitates a collaborative and integrated approach to actions required to effectively coordinate a response to and recovery from an emergency or disaster within the region
- Regional Emergency Management Agreement – provides guidelines for coordinating an effective, multi-agency response when emergencies cannot be handled by local response agencies.
- Community Wildfire Protection Plans – identifies areas at high risk of wildfire; assigns planning priorities; and establishes a cooperative framework to improve community safety, reduce the risk of property damage, and protect natural resources.
- Emergency Management Oceanside (EMO) – partnership between Regional District of Nanaimo, City of Parksville, and Town of Qualicum Beach to increase efficiency and effectiveness of emergency management in the region.
- Emergency Operation Centre and Reception Centres pre-identified – yearly exercises and training for activation readiness and improvements
- Emergency Support Services (ESS) – organization of trained volunteers ready to assist residents in the event of an emergency.
- Emergency communications volunteers – volunteers, including operators licensed through Industry Canada as radio operators provide emergency communications within the region.
- Emergency Notification System – mass emergency notification system to deliver both text and voice calls to those signed up to receive notifications.
- Radio communication established between schools and administration centres and school busses.
- Emergency services inter-agency partnerships established with: RCMP, BC Ambulance Service (BCAS), Fire Departments (15 departments operating 23 fire halls), Search and Rescue (SAR), Canadian Coast Guard.

Additional response resources and services can be found in [Appendix 5](#).

Resilience minimizes vulnerability by developing and fortifying the social and physical capacity to cope with, adapt to, respond to, recover, and learn from disasters (Public Safety Canada, 2019c).

As evidenced by the examples noted in the table above, significant efforts have been taken, or are underway, to enhance resiliency within the region. Many of these initiatives are being driven at the local level by individual communities and are not necessarily 'regional' initiatives.

Fundamental to recovery is the ability of communities to cooperate and join forces to overcome the many challenges when faced with an adverse event. Thus, community resilience takes a communal perspective to coping with disasters and encompasses ideas like problem-solving, efficiency, and adaptability (Bergstrand, Mayer, & Zhang, 2015). Consideration to coordinate and leverage the previous, current or planned efforts to enhance prevention, mitigation, preparedness, and response, by other communities and ideally at a regional level, will help to further the overall resiliency within the region.

010 Conclusion

"The reason one completes an HRVA is to set priorities for sustainable hazard mitigation – to develop an action plan towards becoming a disaster resilient community." (Pearce, 2011, p. 2)

This HRVA is a foundational step towards enhancing regional resilience. Through the calculation and plotting of risk, the HRVA has provided local community members, stakeholders, and decision-makers with a view of the risks across all hazards. The findings can serve as a useful tool in promoting robust discussions, determining unacceptable levels of risk, and arriving at highest priority hazards for risk management, resiliency building, and emergency preparedness activities.

The HRVA process, through engagement with local stakeholders and Indigenous community leaders, served to strengthen relationships and build a shared understanding of risks posed to the region as a method to contribute to long-term resiliency. Several workshop participants shared the value the HRVA and engagement session offered to their member communities and agencies.

"We learned that familiarization with each other's methods and how you share information and what you're capable of doing and not capable of doing has benefited us now with subsequent incidents. There's more knowledge about how everybody can work together." (Engagement Session Participant)

"The benefit of being connected together, understanding from the onset of an event what the possible scope would be, that way we can gauge how we need to be able to respond after the fact." (Engagement Session Participant)

The results of the assessment reveal that natural hazards pose the greatest risk to the region, and that the risk from the majority of hazards locally is increasing, due to climate change and urbanization. Within British Columbia, climate change has already resulted in increased average temperatures, rising sea levels, as well as increased rates of severe weather events (BC Ministry of Environment and Climate Change Strategy, 2019). The BC Ministry of Environment and Climate Change anticipates that severe wildfire seasons and seasonal water shortages will be the greatest risks to all of British Columbia as a result of climate change by the year 2050 (BC Ministry of Environment and Climate Change Strategy, 2019).

While a detailed description of the top hazards was presented in this report, this selection represents a small portion of the hazards the region faces. With a total of **53 hazards** identified, the results of the HRVA can be leveraged by individual communities and stakeholder agencies to consider the likelihood of occurrence and consequences posed to them specifically.

With the identification of the high-risk hazards and acknowledgement of the evolving risk locally due to climate change and urbanization, the next step for the region is to specify approaches to manage and mitigate the risk.

This report serves as a resource to support current and proposed projects, or the prioritization and initiation of new projects, to support resiliency building and risk mitigation, such as:

- Assessing the capacity of local critical assets and response resources to withstand and respond to an impactful hazardous event and maintain or resume services (business continuity planning);
- Collaborating with critical infrastructure owners/operators, and provincial and federal government agencies to understand the current and future strategies identified to protect their assets and property from potential hazards, and maintain their ability to deliver services during an incident;
- Identifying the applicability, and mapping, of the hazards to the specific electoral areas and communities in the region, such as preparing and updating flood and wildfire hazard maps;

As the local impacts of climate change transpire, and new information becomes available, the results of this hazard assessment should be re-evaluated, and the prioritization of associated mitigation and adaptation strategies reconsidered.

One of the key factors in developing a resilient community is to motivate and support residents in undertaking prevention and mitigation efforts and engaging in preparedness activities. Publicly sharing the HRVA, can enhance the awareness of the community to the existing and potential hazards in the region, and the corresponding risk. Educating the region's residents can increase the prioritization and support of initiatives that can move the region towards becoming a more disaster resilient community.

Future strategies to reduce the risk of disasters should aim at preventing the creation of risk; reducing existing risk; strengthening economic, social, health and environmental resilience; and enhancing preparedness for effective response and to "build back better" in recovery (UN Office

Highest risk natural hazards

- Wildfire and Urban Interface Fire
- Overland Flooding
- Wind Event
- Drought

Highest risk technological hazards

- Motor Vehicle Incident
- Electrical Power Outage
- Structure Fire

Highest consequence hazards

- Megathrust Earthquake
- Intentional Acts of CBRNE
- Active Threat
- Human Disease

for Disaster Risk Reduction, 2019). Alignment and prioritization of policies across local governments and communities within the region, as well as execution of an integrated and inclusive planning process, will be essential to manage the evolving risk and will contribute to a safer and more resilient region.

Through the efforts of the Production Team and the engagement session participants, the region has an assessment that can be confidently used in risk-based decision making, the setting of priorities for proactive hazard mitigation, and in developing an action plan towards becoming a disaster resilient community.

Appendices

APPENDIX 1. Glossary of Key Terms

Asset	Equipment or personnel used to deliver a service. People, structures, facilities, buildings, materials, and processes can all be considered Assets (EMBC, n.d.-a, p. 4).
Consequence/ Impact	The physical/environmental, social, economic, and political impact or adverse effects that may occur as the result of a hazardous event (EMBC, 2011, p. 3).
Critical Infrastructure	The processes, systems, facilities, technologies, networks, assets and services essential to the health, safety, security or economic well-being of a community. Critical infrastructure can be stand-alone or interconnected and interdependent within and across provinces, territories and national borders. Disruptions of critical infrastructure could result in catastrophic loss of life, adverse economic effects and significant harm to public confidence (Public Safety Canada, 2019b, para. 1).
Frequency	The number of occurrences of an event in a defined period of time (Public Safety Canada, 2018a).
Hazard	A source of potential harm, or a situation with a potential for causing harm, in terms of human injury; damage to health, property, the environment and other things of value; or some combination of these (EMBC, 2011, p. 3).
Likelihood	The chance of an event or an incident happening, whether defined, measured or determined objectively or subjectively (Public Safety Canada, 2012).
Mitigation	Mitigation measures are those that eliminate or reduce the impacts and risks of hazards through proactive measures taken before an emergency or disaster occurs (Public Safety Canada, 2015a, para. 1).
Preparedness	The phase of emergency management during which action is taken to ensure that individuals, businesses, and the jurisdiction/ organization are ready to undertake emergency response and recovery (EMBC, 2019, p. 98).
Recovery	The restoring or improving of livelihoods and health, as well as economic, physical, social, cultural and environmental assets, systems and activities, of a disaster-affected community or society, aligning with the principles of sustainable development and “build back better”, to avoid or reduce future disaster risk (UN Office for Disaster Risk Reduction, 2017).

Resilience	The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management (UN Office for Disaster Risk Reduction, 2017).
Vulnerability	The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards (UN Office for Disaster Risk Reduction, 2017).

APPENDIX 2. Hazard Definitions

The following list of hazards was compiled to capture hazards relevant to the region. The hazards are arranged alphabetically – first by hazard category (Conflict, Natural, Technological), then by sub-category (e.g. Security/Threat, Biological, Climatological, etc.).

In total, 53 hazards were identified that could affect the region, determined through the review of historical data, previous HRVAs, provincial (EMBC), federal (Public Safety Canada) and international hazard lists; and engagement of community members and subject matter experts.

A variety of emergency management and risk reduction standards, frameworks, and tools were surveyed to tailor the approach to classifying and grouping hazards, which resulted in the following broad hazard types, conflict, natural and technological, being defined. Within each category, hazards were further classified into sub-categories, as listed below.

Conflict Hazards <i>Human-caused hazards originating from intentional human actions.</i>	Natural Hazards <i>Environmental processes that have the potential to interact with humans and infrastructure.</i>	Technological Hazards <i>Hazards that stem from technological or industrial conditions as well as the consequences of an event related to a natural hazard.</i>
• Security/Threat	• Biological • Climatological • Extraterrestrial • Geological • Hydrological – Flooding • Hydrological – Other • Meteorological	• Hazardous Materials • Infrastructure Failure • Communications • Energy • Food • Health • Water • Other Incidents • Transportation Incidents

CONFLICT HAZARDS

Security/Threat

A hazard originating from intentional human actions.

<i>Active Threat</i>	An active threat is when an individual is actively engaged in killing or attempting to kill people in a confined and populated area (U.S. Department of Homeland Security, 2008, p. 2). This is inclusive of active shooters in both public and industrial spaces.
<i>Cyber Security Threat</i>	A circumstance or event with the potential to interrupt or adversely impact organizational operations, assets, or individuals (including mission, functions, image or reputation). Cyber threats occur through information systems via unauthorized access, destruction, disclosure, modification of information, and/or denial of service.
<i>Hijacking</i>	The unexpected, unlawful and forceful seizure of control aboard an aircraft, boat or ship, wheeled or tracked vehicle by an individual or group of individuals resulting in passenger and crew endangerment, injury or death, and/or the redirection of flight destination (Public Safety Canada, 2015b). This definition also includes forceful seizure of control of public buildings resulting in endangerment, injury or death.
<i>Intentional Acts of CBRNE</i>	An event that involves a potential, perceived, or actual act with chemical or biological, radiological, nuclear or explosive materials that are, or are suspected to be, used in a deliberate or intentional way to cause harm (Public Safety Canada, 2015b).
<i>Public Disturbance</i>	An act or interruption that interferes with the operation of society and the ability of people to function efficiently. Examples include mass gatherings, riots and demonstrations.

NATURAL HAZARDS

Biological

A hazard caused by the exposure to living organisms and their toxic substances or diseases.

<i>Animal Disease</i>	Animal diseases or sicknesses can be spread from animals to animals and from animals to humans. They can be classified as: non-infectious diseases, infectious diseases, and diseases caused by parasites (Pearce, 1997).
<i>Human Disease</i>	Diseases that are caused by pathogenic microorganisms and are spread directly, or indirectly, from one person to another. Epidemic refers to an increase, often sudden, in the number of cases of a disease above what is normally expected in that population in that area (Center for Disease Control and Prevention, 2012, para. 3). Pandemic is the worldwide spread of a new disease. The total number of people who get severely ill can vary. However, the impact or severity tends to be higher in pandemics in part because of the much larger number of people in the population who lack pre-existing immunity to the new virus (World Health Organization, 2010).
<i>Insect Infestation and Plant Disease</i>	An event involving invasive pests such as insects and mites or plant pathogens including fungi, bacteria and viruses.

Climatological

A hazard caused by long-lived atmospheric process and climate variability.

<i>Air Quality</i>	Air pollution occurs when the air contains gases, dust, fumes or odour in harmful amounts. Substances that cause air pollution are called pollutants and they can be liquid, solid, or gaseous. An air quality advisory is issued when pollutant concentrations approach or exceed predetermined limits, or when degraded-air-quality episodes are expected to continue or worsen (Government of British Columbia, n.d.-a). <i>British Columbia utilizes the Air Quality Health Index (AQHI) to issue advisories on a scale of 1 to 10. The higher the number, the greater the health risk associated with the air quality.</i> • 1-3: Low health risk • 4-6: Moderate health risk • 7-10: High health risk • 10⁺: Very high health risk (Government of Canada, 2019).
<i>Drought</i>	Drought is a recurrent feature of climate involving a deficiency of precipitation over an extended period, resulting in a water shortage for activities, communities or aquatic ecosystems. In British Columbia (BC), combinations of insufficient snow accumulation, hot and dry weather, or a delay in rainfall may cause drought (Government of British Columbia, 2018, p. 1).
<i>Fires (Wildfire and Wildland Urban Interface)</i>	Wildfire: An unplanned fire – including unauthorized human-caused fires – occurring on forest or range lands, burning forest vegetation, grass, brush, shrub, peat lands, or a prescribed fire set under a regulation which spreads beyond the area authorized for burning (EMBC, n.d.-b). Wildland Urban Interface (WUI): Any area where combustible forest fuel is found adjacent to homes, farm structures, or other outbuildings. This may occur at the interface, where development and forest fuel (vegetation) meet at a well-defined boundary, or in the intermix, where development and forest fuel intermingle with no clearly defined boundary (EMBC, n.d.-b).

Extraterrestrial

A hazard originating outside of the earth's atmosphere.

<i>Extraterrestrial Debris</i>	A type of extraterrestrial hazard caused by a natural object (e.g. meteoroid, asteroid, comet etc.) or human-made object (e.g. satellite, space vehicle etc.) entering the earth's atmosphere and the resulting debris colliding with the earth.
<i>Geomagnetic Storm</i>	A type of extraterrestrial hazard caused by solar wind shockwaves (solar flare) that temporarily disturb the Earth's magnetosphere.

Geological

A hazard originating from solid earth.

<i>Avalanche</i>	The movement of snow and ice in response to the force of gravity down a mountainside.
<i>Coastal Erosion and Sedimentation</i>	The temporary or permanent loss of sediments or landmass in coastal margins due to the action of waves, winds, tides or human activities (Integrated Research on Disaster Risk, 2014, p. 13).
<i>Landslide</i>	A landslide is any type of slope failure or downward movement of rock and/or sediment (includes rock-fall, debris flows, slumps and slides, etc.). Excessive rainfall, earthquakes and certain human activities are some of the factors that commonly trigger landslides (Natural Resources Canada, 2017, para. 1).
<i>Earthquake</i>	An earthquake is defined as the shaking of the ground due to movement along a fault rupture (EMBC, 2019). For the purposes of this definition, an earthquake is considered to have a magnitude of between a 5 to 8.4 (Note: "Megathrust earthquakes", those with a magnitude of 8.5 and above, are defined separately).
<i>Land Subsidence and Sinkholes</i>	The sinking or caving in of the ground due to groundwater removal, mining, dissolution of limestone (e.g., karst, sinkholes), extraction of natural gas, and earthquakes (Integrated Research on Disaster Risk, 2014, p. 17).
<i>Megathrust Earthquake</i>	A megathrust earthquake is a very large earthquake that occurs in a subduction zone, a region where one of the earth's tectonic plates is thrust under another. The Cascadia subduction zone is located off

	the west coast of North America. From mid Vancouver Island to northern California the Juan de Fuca Plate is subducting beneath the North American Plate. The two plates are continually moving towards one another yet become "stuck" where they are in contact. Eventually the build-up of strain exceeds the friction between the two plates and a huge megathrust earthquake occurs (Natural Resources Canada, 2019c, para. 1). For the purposes of this definition, megathrust earthquakes have a magnitude of 8.5 or greater.
<i>Volcanic Ash Fallout</i>	Ash falls occur where fine volcanic ash has been ejected out of a volcanic vent into the atmosphere, possibly transported by upper level winds, and deposited on the earth.

Hydrological – Flooding

A flood is a general term for the overflow of water from a lake, river, or stream channel onto normally dry land (rivers, lakes and stream flooding), higher-than normal levels along the coast (coastal flooding), as well as ponding of water at or near the point where the rain fell (overland flooding) (Integrated Research on Disaster Risk, 2014, p. 14).

<i>Coastal Flooding</i>	Higher-than-normal water levels along the coast caused by tidal changes or thunderstorms that result in flooding, which can last from days to weeks (Integrated Research on Disaster Risk, 2014, p. 13). High winds from tropical cyclones or other storms push water onshore to create a storm surge, which is the leading cause of coastal flooding and represents the greatest threat associated with such storms. Coastal flooding can be amplified or dampened by tides, both daily tides and periodic king tides, which are much larger tides that occur monthly or yearly due to the interaction of the earth, moon, and sun in their orbits (Resource and Environment Working, n.d., p. 7). Storm Surge: A storm surge consists of very high waves and high water levels caused by the wind and air pressure "pushing" the water onto the shore, often resulting in high waves and flooding. Storm surge can occur along all coastal areas of Canada. It can also occur in large lakes, such as the Great Lakes (Public Safety Canada, 2018c). King Tide: King Tides (also known as perigean spring tides) are extreme high tide events that occur when the sun and moon's
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	gravitation forces reinforce one another at times of the year when the moon is closest to the earth. They happen twice a year but are typically more dramatic during the winter (Government of British Columbia, 2015, para. 1).
<i>Rivers, Lakes and Streams Flooding</i>	A type of flooding resulting from the overflow of natural lake shorelines or water from a stream or river channel onto normally dry land in the floodplain adjacent to the channel (Integrated Research on Disaster Risk, 2014, p. 16). These floods can be caused by intense rainfall, rapid snowmelt (including freshet events), and ice jams blocking the rivers. Freshet: The movement of water associated with the thawing of ice and snow each spring. This runoff can result in high water levels in streams, lakes and other waterways (Abbott & Chapman, 2018, p. 17). Ice Jams: The accumulation of floating ice restricting or blocking a river's flow and drainage. Ice jams tend to develop near river bends and obstructions (e.g., bridges) (Integrated Research on Disaster Risk, 2014, p. 15).
<i>Overland Flooding</i>	Overland flooding (also known as "pluvial flooding") results from rainfall-generated overland flow. This type of flooding is usually associated with high intensity rainfall events (typically >30mm/h) but can also occur with lower intensity rainfall or melting snow where the ground is saturated, frozen, developed or otherwise has low permeability resulting in overland flow and ponding in depressions in the topography (Maksimovic, 2015). High intensity 'extreme' rainfall events in urban environments may cause sewerage/drainage systems to be completely overwhelmed and result in flooding.

Hydrological – Other

A hazard originating from surface and/or subsurface freshwater or saltwater.

<i>Saltwater Intrusion</i>	When saline (salty) water is drawn in into a freshwater aquifer, making the water unpotable. This can affect one well or multiple wells in an aquifer and can occur either due to natural processes or human activities (Government of British Columbia, 2016a, p. 1).
<i>Seiche</i>	A standing wave of water in a large semi- or fully-enclosed body of water (lakes or bays) created by strong winds and /or a large difference in atmospheric pressure (UN Office for Disaster Risk Reduction, p. 3).
<i>Tsunami</i>	A series of waves (with long wavelengths when traveling across the deep ocean) that are generated by a displacement of massive amounts of water through underwater earthquakes, volcanic eruptions or landslides. Tsunamis travel at very high speed across the ocean but slow down and grow steeper as they begin to reach shallow water (Integrated Research on Disaster Risk, 2014, p. 17). This definition includes the effects caused by both remote source (telegenic) tsunamis and those caused by terrestrial and submarine landslides (terrestrial).

Meteorological

A hazard caused by short-lived extreme weather and atmospheric conditions.

<i>Cold Event</i>	A period of abnormally cold weather. Typically, a cold wave (-15°C) lasts two or more days and may be aggravated by high winds.
<i>Fog</i>	A cloud based at the earth's surface, consisting of tiny water droplets, or under very cold conditions, ice crystals or ice fog. It is generally found in calm or low wind conditions. Under foggy conditions, visibility is reduced to less than 1 kilometer (Environment and Climate Change Canada, 2017). A fog advisory is issued when fog is expected to persist and induce low visibility for at least 6 hours
<i>Freeze Event</i> (Frost, Freezing Rain, Flash Freeze)	An event involving the deposit or coating of ice on an object, e.g.: Frost: A deposit of ice crystals that forms through the process of sublimation (Environment and Climate Change Canada, 2017), which occurs when the temperature of surfaces is below freezing and water vapor from humid air forms solid deposits

	on the cold surface (Integrated Research on Disaster Risk, 2014, p. 15). Freezing Rain: Rain that freezes on impact to form a coating of clear ice (glaze) on the ground and on exposed objects. A freezing rain warning is issued when freezing rain is expected to pose a hazard to transportation or property or when freezing rain is expected for at least 2 hours. Flash Freeze: When significant ice is expected to form on roads, sidewalks or other surfaces over much of a region because of a rapid drop in temperature resulting in the freezing of residual water from either melted snow or falling/fallen rain.
<i>Hail</i>	Precipitation in the form of ice lumps which develop in the core of a thunderstorm. Hailstones have a minimum diameter of 5 mm and can grow larger than 10 cm (the size of a grapefruit). Hail can hit the ground at 130 kilometers per hour (Public Safety Canada, 2015d, para. 2).
<i>Heat Event</i>	A period of abnormally hot and/or unusually humid weather. Typically, a heat wave lasts two or more days (Integrated Research on Disaster Risk, 2014, p. 15). A heat warning is issued when 2 or more consecutive days of daytime maximum temperatures are expected to reach 29°C or warmer and nighttime minimum temperatures are expected to fall to 16°C or warmer.
<i>Rainfall Event</i>	Water vapor condenses in the atmosphere to form water droplets that fall to the Earth (Integrated Research on Disaster Risk, 2014, p. 16). Inland Vancouver Island will receive a rainfall warning when 100 mm or more of rain is expected within 24 hours. Coastal sections will receive a rainfall warning when 50 mm or more of rain is expected within 24 hours, or when 75 mm of rain is expected within 48 hours.
<i>Snow Event</i>	Meteorological disturbance giving rise to a heavy fall of snow, often accompanied by strong winds (also referred to as a blizzard or blowing snow event) (EMBC, 2019).

	A snowfall warning is issued when 10 cm or more of snow falls within 12 hours or less; or when 5 cm or more of snow falls within 6 hours or less (Government of Canada, 2019, table 18). A blowing snow advisory is issued when blowing snow, caused by winds of at least 30 km/h, is expected to reduce visibility to 800 m or less for at least 3 hours (Government of Canada, 2019, table 3).
<i>Thunderstorm</i>	A local storm, usually produced by a cumulonimbus cloud, and always accompanied by thunder and lightning (Environment and Climate Change Canada, 2017).
<i>Wind Event</i>	Differences in air pressure resulting in the horizontal motion of air. The greater the difference in pressure, the stronger the wind. Wind moves from high pressure toward low pressure (Integrated Research on Disaster Risk, 2014, p. 18). A wind warning is issued when there is 70 km/h or more sustained wind; and/or gusts to 90 km/h or more.

TECHNOLOGICAL HAZARDS

Hazardous Materials

A hazardous material is any agent which has the potential to cause harm either by itself or through the interaction with other factors.

<i>Hazardous Materials Release – Land</i>	A spill on site or transport route is any uncontrolled release of material posing a risk to health, safety, and property (Government of British Columbia, 2004, pp. 4-10). Includes all incidences whether they are in-transit or stationary, motor vehicle, rail, pipeline or industry related.
<i>Hazardous Materials Release – Marine</i>	An accidental leak, spill or release of a chemical into the marine environment which poses a danger to human or ecosystem health. Includes both tidal and non-tidal, in-transit and stationary incidences.

Infrastructure Failure – Communications

A hazard arising from the disruption of communication and technology services, including provision of networks, data lines, and internet service by the local government. Information and communications technology include providing voice-over-internet service, data services, first responder communications, etc.

<i>Communications Interruption</i>	The unavailability of services provided by the communications infrastructure caused by human error, equipment malfunction or breakdown (Public Safety Canada, 2015b). Included in this definition are interruptions to landlines, cellphones, internet, commercial radio, satellites etc.
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Infrastructure Failure – Energy

A hazard arising from the inability to of the local government to provide energy to the community. Energy and utilities include electrical power provision and the municipally owned related infrastructure (power lines, transmission stations), natural gas provision and the externally owned related infrastructure, the supply and distribution of gasoline, etc.

<i>Dam Failure</i>	Dam failure is a breach in the dam itself, its foundations, abutments, or spillway, which results in large or rapidly increasing, uncontrolled releases of water from the reservoir (Government of British Columbia, 2004, pp. 4-8). Dam: A barrier constructed for the purpose of enabling the storage or diversion of water diverted from a stream or an aquifer, or both (Government of British Columbia, 2016c, para. 1). Spillway: Structures constructed to provide safe release of flood waters from a dam to a downstream area, normally the river on which the dam has been constructed (Jamal, 2017, para. 1).
<i>Electrical Power Outage</i>	A power outage is a short or long-term loss of electric power to an area (Government of British Columbia, n.d.-f).
<i>Fuel Supply Interruption</i>	A deficit, interruption or failure of fuel systems, services, supplies or resources (EMBC, 2019). Includes pipeline damage, transportation delays due to weather and/or shipping infrastructure damage or general shortages due to market supply problems, or panic fuel hoarding during emergencies.

Infrastructure Failure – Food

A hazard arising due to the inability to safely produce and distribute food.

<i>Food Supply Chain Interruption</i>	A disruption to the food supply or delivery system that may result in food shortages in a community.
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Infrastructure Failure – Health

A hazard arising due to the interruption of health services that are provided and managed by the local government.

<i>Health Interruption</i>	An interruption to basic health services. Includes the reduction or loss of access to healthcare systems and/or medical resources e.g. prescription supply, health workers, health facilities and services, and specialized health technology.
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Infrastructure Failure – Water

A hazard arising due to the failure of the provision of safe drinking water and removal & processing of wastewater by the local government. Examples include the provision of drinking water, removal and processing of sewer and wastewater, inspection and maintenance of wells and reservoirs, etc.

<i>Potable Water Supply Interruption</i>	A deficit, interruption or failure of water systems, services, supplies or resources. The types of water included in this definition are; well water, treatment facilities, storage, water supply contamination.
<i>Waste Water Interruption</i>	A deficit, interruption or failure of waste water or sewer systems, services, supplies, or resources. Facilities included in this definition are; Sanitary facilities, pump stations, septic fields, runoff, leaks and contamination.

Other Incidents

A category to capture other incidents such as an explosion, building collapse, etc.

<i>Bridge Collapse</i>	The failure of a bridge structure or component resulting in a loss of structural integrity or load-carrying capacity.
<i>Building Collapse</i>	The failure of a building structure or component resulting in a loss of structural integrity or load-carrying capacity. Structural collapse occurs when a building or structure collapses due to engineering or construction problems, metal fatigue, changes to the load bearing capacity of the structure, human operating error or any other cause such as earthquake, flood, fire, explosion, and snow or ice buildup (Government of British Columbia, 2004, pp. 4-11).
<i>Incident at the Canadian Forces Maritime Experimental Test Range (CF-METR)</i>	An incident involving the Canadian Forces Maritime Experimental and Test Ranges (CF-METR), which is a maritime test facility located at Nanoose Bay hosting nuclear-powered vessels and vessels carrying fissionable material.

<i>Structure Fire</i>	A fire burning in industrial, commercial, or residential structures. Includes, but is not limited to, fires burning in factories, storage facilities, office buildings, homes and apartment buildings, schools, hotels, and retail outlets.
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Transportation Incidents

The category transportation incident can include incidents associated with motor vehicle, aircraft, marine, and/or rail.

<i>Aircraft Incident</i>	An air crash is an incident involving one or more aircrafts that results in damage to aircraft, property or human injury or death. Most crashes occur near airports; however, they can occur anywhere in the rugged terrain of British Columbia (Government of British Columbia, 2004, pp. 4-7).
<i>Motor Vehicle Incident</i>	An incident whenever a vehicle, be it a truck, passenger car, bus, farm vehicle or any other motor- or person-powered vehicle collides with another vehicle, train or other obstruction; or loses control and incurs damage (EMBC, 2019).
<i>Marine Vessel Incident</i>	An event involving a boat or ship that threaten human life, property and natural resources that may or may involve a vessel submerging, damage, bodily injury, death and/or the disruption of transportation service (Public Safety Canada, 2015b).
<i>Rail Incident</i>	When a train derails or collides with another train, motor vehicle, or obstruction on the rail tracks. Rail accidents have potential for a severe human or environmental impact (Government of British Columbia, 2004, pp. 4-7).

APPENDIX 3. Full Hazard Assessment Scores

Hazard Table with all Likelihood, Consequence and Risk Scores		Human & Social Impacts							Physical & Economic Impacts						Overall Consequence (11-55)	Risk	Confidence Rating
Hazard	Likelihood (1-5)	Fatalities (1-5)	Injury/Illness (1-5)	Displacement (1-5)	Psychosocial (1-5)	Support System Impact (1-5)	Cultural Resource Impact (1-5)	Sub-Total (6-30)	Property Damage (1-5)	Critical Infrastructure (1-5)	Environmental (1-5)	Economic (1-5)	Reputational (1-5)	Sub-Total (5-25)			
 Fires (Wildfire and Urban Interface)	5	2	2	4	3	4	4	19	3	4	4	4	3	18	37	185	(A)
 Overland Flooding	5	2	2	3	3	3	2	15	3	3	3	2	3	14	29	145	(C)
 Wind Event	4	2	3	3	2	3	3	16	4	4	4	4	3	19	35	140	(A)
 Drought	5	1	2	2	1	3	3	12	2	3	4	4	3	16	28	140	(B)
 Motor Vehicle Incident	4	4	4	2	4	4	1	19	3	2	2	2	3	12	31	124	(B)
 Electrical Power Outage	5	2	2	3	2	3	1	13	2	3	1	3	2	11	24	120	(B)
 Structure Fire	5	2	2	2	3	2	3	14	3	2	2	1	2	10	24	120	(A)
 Rivers, Lakes, and Stream Flooding	5	1	1	2	2	2	1	9	2	3	3	3	3	14	23	115	(B)
 Coastal Flooding	5	1	1	2	1	1	4	10	3	3	2	2	2	12	22	110	(C)
 Freeze Event	5	2	2	1	2	2	1	10	2	2	3	2	2	11	21	105	(B)
 Saltwater Intrusion	5	1	1	2	1	2	3	10	2	2	4	1	2	11	21	105	(C)
 Landslide	4	2	2	3	2	2	2	13	3	2	3	2	3	13	26	104	(C)
 Hazardous Material Release Land	4	1	2	3	2	2	3	13	2	3	4	2	2	13	26	104	(C)
 Insect Infestation & Plant Disease	4	1	1	1	3	2	4	12	4	1	4	3	2	14	26	104	(D)
 Air Quality	4	2	3	3	2	3	1	14	1	2	3	3	2	11	25	100	(B)
 Coastal Erosion and Sedimentation	5	1	1	2	1	1	2	8	2	2	2	2	4	12	20	100	(C)
 Human Disease	3	4	4	4	4	4	1	21	1	3	1	3	4	12	33	99	(C)
 Snow Event	4	2	2	2	2	3	2	13	2	2	1	2	3	10	23	92	(B)
 Animal Disease	4	1	1	1	3	2	1	9	4	1	3	3	2	13	22	88	(D)
 Food Supply Chain Interruption	3	2	2	3	4	4	1	16	2	2	2	3	4	13	29	87	(D)
 Marine Vessel Incident	3	3	4	2	4	2	1	16	3	2	3	2	3	13	29	87	(C)
 Land Subsidence and Sinkholes	5	1	2	2	2	1	1	9	2	2	2	1	1	8	17	85	(C)
 Hazardous Material Release Marine	3	1	2	2	1	2	4	12	2	3	4	2	4	15	27	81	(C)
 Potable Water Supply Interruption	3	2	3	2	3	3	3	16	1	2	2	3	3	11	27	81	(C)
 Fog	5	2	2	1	2	1	1	9	2	2	1	1	1	7	16	80	(B)
 Heat Event	5	2	2	2	2	2	1	11	1	1	1	1	1	5	16	80	(B)
 Fuel Supply Interruption	3	2	2	3	2	3	1	13	2	4	1	3	3	13	26	78	(D)
 Earthquake	3	1	2	2	2	2	2	11	3	3	2	2	3	13	24	72	(B)
 Intentional Acts of CBRNE	2	3	3	3	4	3	2	18	3	3	4	3	4	17	35	70	(E)

Hazard Table with all Likelihood, Consequence and Risk Scores

		Human & Social Impacts							Physical & Economic Impacts						Overall Consequence (11-55)	Risk	Confidence Rating
		Fatalities (1-5)	Injury/Illness (1-5)	Displacement (1-5)	Psychosocial (1-5)	Support System Impact (1-5)	Cultural Resource Impact (1-5)	Sub-Total (6-30)	Property Damage (1-5)	Critical Infrastructure (1-5)	Environmental (1-5)	Economic (1-5)	Reputational (1-5)	Sub-Total (5-25)			
 Thunderstorm	5	1	1	1	1	1	1	6	2	2	2	1	1	8	14	70	Ⓒ
 Cyber Security Threat	3	1	1	1	3	3	1	10	1	3	1	4	4	13	23	69	Ⓓ
 Geomagnetic Storm	3	1	1	1	1	3	1	8	2	4	2	4	3	15	23	69	Ⓓ
 Active Threat	2	4	4	2	5	3	1	19	2	2	2	4	4	14	33	66	Ⓓ
 Cold Event	3	2	2	2	2	3	1	12	2	2	2	2	2	10	22	66	Ⓑ
 Hail	5	1	2	1	1	1	1	7	2	1	1	1	1	6	13	65	Ⓒ
 Aircraft Incident	2	4	4	2	4	3	1	18	3	2	2	3	4	14	32	64	Ⓒ
 Dam Failure	2	3	3	2	3	2	3	16	3	4	3	3	3	16	32	64	Ⓑ
 Rainfall Event	4	1	2	2	2	2	1	10	1	1	2	1	1	6	16	64	Ⓑ
 Communications Interruption	3	2	1	1	2	3	1	10	1	3	1	3	3	11	21	63	Ⓑ
 Bridge Collapse	2	3	3	2	3	3	1	15	3	2	3	2	4	14	29	58	Ⓓ
 Megathrust Earthquake	1	5	5	5	5	5	5	30	5	5	5	5	5	25	55	55	Ⓒ
 Building Collapse	2	3	3	2	3	3	1	15	3	1	2	3	2	11	26	52	Ⓒ
 Public Disturbance	2	2	3	2	3	2	2	14	3	2	2	2	3	12	26	52	Ⓒ
 Waste Water Interruption	2	2	2	2	2	2	2	12	3	3	3	2	2	13	25	50	Ⓒ
 Volcanic Ash Fallout	2	1	2	2	1	2	2	10	2	3	4	3	1	13	23	46	Ⓒ
 Hijacking	1	3	3	2	4	3	1	16	3	3	3	3	4	16	32	32	Ⓓ
 Seiche	1	4	3	3	3	3	2	18	3	2	3	2	2	12	30	30	Ⓔ
 Tsunami	1	2	3	4	3	3	2	17	3	2	2	2	4	13	30	30	Ⓑ
 Health Interruption	1	2	2	2	3	3	1	13	1	3	1	2	3	10	23	23	Ⓑ
 Incident at the CFM-ETR	1	2	2	3	2	1	1	11	2	1	3	1	2	9	20	20	Ⓓ
 Rail Incident	1	2	2	1	2	2	1	10	3	1	2	2	2	10	20	20	Ⓒ
 Avalanche	1	1	2	1	1	1	1	7	1	1	1	1	1	5	12	12	Ⓑ
 Extraterrestrial Debris	1	1	1	1	1	1	1	6	1	1	1	1	1	5	11	11	Ⓔ

Legend

Hazard Category

-  Natural Hazard
-  Technological Hazard
-  Conflict Hazard

Confidence Rating

- Ⓐ Very high degree of confidence
- Ⓑ High degree of confidence
- Ⓒ Moderate confidence
- Ⓓ Low confidence
- Ⓔ Very low confidence

APPENDIX 4. The Region's Critical Assets Owned/Operated by Local Government and First Nations

Critical assets are listed below by geographical location:

ELECTORAL AREA A

- Cassidy Fire Hall
- Cranberry Fire Hall (Cranberry Fire Improvement District)
- Decourcey Water System
- Duke Point Pollution Control Centre; SCADA software & equipment
- North Cedar Fire Hall (North Cedar Improvement District)
- Regional Landfill (RDN Solid Waste Department)

ELECTORAL AREA B

- Gabriola Emergency Wharfs
- Gabriola Fire Hall (Gabriola Fire Protection Improvement District)

ELECTORAL AREA C

- Arrowsmith Dam and Connections
- East Wellington Fire Hall (Mountain Improvement District)
- Extension Fire Hall

ELECTORAL AREA E

- Nanoose Fire Hall
- Nanoose Bay Peninsula
(includes water treatment plant and SCADA software & equipment)
- Nanoose Pollution Control Centre

ELECTORAL AREA F

- Church Road Transfer Station (RDN Solid Waste Department)

-
- Coombs Fire Hall
 - Errington Fire Hall
 - Melrose Terrace Water System
 - Westurne Heights Water System
 - Whiskey Creek Water Service Area

ELECTORAL AREA G

- Dashwood Fire Hall
- Englishman River Water Service
- French Creek Sewer Treatment Plant
- French Creek Water System
- Meadowood Fire Hall
- San Paniel Water System with SCADA software & equipment
- Surfside Water System

ELECTORAL AREA H

- Bow Horn Bay Fire Hall
- Deep Bay Fire Hall (Deep Bay Waterworks Improvement District)
- Greater Nanaimo Pollution Control Centre; SCADA software & equipment

FIRST NATIONS

- Qualicum First Nation Office
- Snaw-Naw-As (Nanoose) First Nation Office
- Snuneymuxw First Nation Office

DISTRICT OF LANTZVILLE

- Lantzville Fire Hall
- Lantzville Town Hall
- Lantzville Costin Hall

CITY OF PARKSVILLE

- Parksville City Hall
- Parksville Civic and Technology Centre
- Parksville Public Works Yard

-
- SCADA software & equipment
 - Water Treatment Facility
 - Parksville Fire Department

TOWN OF QUALICUM BEACH

- Berwick Station: Communications tower (multiple services)
- Qualicum Beach Fire Hall
- Qualicum Beach Public Works Yard
- Qualicum Beach Town Hall
- Qualicum Beach water system
- Qualicum Beach Civic Centre
- SCADA software & equipment
- Sanitary lift stations (Hall road, Higson Crescent)
- Transfer/emergency reservoir (one) isolated from distribution system

REGIONAL DISTRICT OF NANAIMO ASSETS WITHIN THE CITY OF NANAIMO

- Main Administrative office & Transit Headquarters (Hammond Bay Rd, Nanaimo)

APPENDIX 5. Response Services and Resources

An additional output from the population of the *Critical Infrastructure Assessment Tool* was a listing of response services and resources within the region.

A preliminary listing of response services and resources extracted from the *Critical Infrastructure Assessment Tool* is below. Additional efforts to continue to populate, and maintain the list, will assist the emergency management programs in the region to have a collated identification of response services and resources to support planning for restoration priorities, business continuity and resiliency initiatives.

PRIMARY RESPONSE SERVICES

Police

- Ladysmith RCMP
- Nanaimo RCMP
- Oceanside RCMP
- Gabriola RCMP

Ambulance

Ambulance Station

- Station 120 Nanaimo South
- Station 130 Parksville
- Station 138 Qualicum Beach
- Station 153 Gabriola Island
- Station 173 Bowser

Critical Care Transport Station

- Station 122/180 Nanaimo North

Fire Departments⁹

Bow Horn Bay Fire Department

- 21 Volunteer firefighters
- Nine (9) fire service vehicles
- Extraction equipment

City of Nanaimo Fire Department

- Five (5) fire halls

⁹ Counts of firefighting resources were not available for all departments at the time of this report.

Coombs Fire Department

- 32 Volunteer firefighters
- Six (6) fire service vehicles
- Rescue pumper
- Two (2) fire halls

Cranberry Fire Department

- 35 Volunteer firefighters
- Two (2) fire halls

Dashwood Volunteer Fire Department

- 35 Volunteer firefighters
- Two (2) fire halls
- 12 fire service vehicles

Deep Bay Fire Department

East Wellington Fire Department

Errington Fire Department

- 40 Volunteer firefighters
- Seven (7) fire service vehicles
- Two (2) fire halls

Extension Fire Department

- 25 Volunteer firefighters

Gabriola Island Fire Department

- 40 Volunteer firefighters
- 12 fire service vehicles
- Two (2) fire halls

Lantzville Fire Department

- 28 Volunteer firefighters
- Six (6) fire service vehicles

Nanoose Fire Department

- 31 Volunteer firefighters
- Nine (9) fire service vehicles

North Cedar Fire Department

-
- 30 Volunteer firefighters
 - 10 fire service vehicles

Parksville Fire Department

- Three (3) career firefighters
- 40 volunteer firefighters
- Eight (8) fire service vehicles
- Fire Special Operations Trailer for confined space and hazardous materials response

Qualicum Beach Fire Department

- 3 career firefighters
- 30 Volunteer firefighters
- One (1) fire hall
- 11 fire service vehicles

Other

- Canadian Coast Guard
- CFMETR Nanoose Naval Base
- Nanaimo Port Authority
- Western Canada Marine Response Corporation

Search and Rescue

- Arrowsmith Search and Rescue
- Nanaimo Search and Rescue
- Royal Canadian Marine Search and Rescue

SECONDARY RESPONSE SERVICES

Amateur Radio

- Emergency Communications Team (City of Parksville, Town of Qualicum, Electoral Areas E, F, G, H)
 - o 15 trained volunteers
- Coast Emergency Communications Association (District of Lantzville, City of Nanaimo, Electoral Area A, B, C)
 - o 40 trained volunteers

Emergency Management Programs

- Regional District of Nanaimo Emergency Management Program
- District of Lantzville Emergency Management Program (contract to RDN)
- Emergency Management Oceanside
 - o City of Parksville

-
- o Town of Qualicum Beach
 - Qualicum First Nation Emergency Program
 - Snaw-Naw-As First Nation Emergency Program
 - Snuneymuxw First Nation Emergency Program

Emergency Operations Centre (EOC)

- Parksville EOC
 - o 45 trained staff
- Qualicum Beach EOC
 - o Internally trained staff
- Regional District of Nanaimo EOC
 - o 94 trained staff

Emergency Support Services

- Gabriola ESS
 - o Trained volunteers
- Lantzville ESS
 - o 12 trained volunteers
- Oceanside ESS (Parksville & Qualicum Beach)
 - o 54 trained volunteers
- Southern Communities ESS
 - o Nine (9) volunteers (undergoing training as of September 2019)
- Nanaimo ESS
 - o 15 trained volunteers

Mutual Aid

- Bi-directional mutual aid agreements between Parksville, Qualicum Beach, RDN, City of Nanaimo, District of Lantzville, Qualicum First Nation, Snaw-Naw-As First Nation, and Snuneymuxw First Nation

Other Government

- Canadian Forces Base – Comox
- Emergency Management BC

Non-Government Organizations

- Canadian Red Cross
- Oceanside Community Safety Volunteers
- Salvation Army
- St. John Ambulance

APPENDIX 6. Engagement Sessions Participants

SESSION 1

Day 1, North Workshop (District 69)

Date: Wednesday October 10, 2018

Location: Eaglecrest Golf Club, Qualicum Beach, BC

Day 2, South Workshop (District 68)

Date: Thursday October 11, 2018

Location: Beban Park Social Centre, Nanaimo, BC

Participants

Total attendees: 66

• Alberni-Clayoquot Regional District	• Health Emergency Management BC
• Arrowsmith Search and Rescue	• Insurance Bureau of Canada
• BC Wildfire Service	• Lantzville Fire Department
• BC Ambulance Service	• Mudge Island Citizens Society
• Bow Horn Bay Fire Department	• Ministry of Transportation and Infrastructure
• CF Maritime Experimental Test Range	• Nanaimo Port Authority
• City of Parksville	• North Cedar Fire Department
• Comox Valley Emergency Program	• North Cedar Improvement District
• Comox Valley Regional District	• Oceanside Emergency Social Services
• Coombs-Hilliers Fire Department	• Oceanside RCMP
• Cowichan Valley Regional District	• Qualicum First Nation
• Provincial Dam Safety Officer	• Regional District of Nanaimo
• Department of Fisheries and Oceans	• Royal Bank of Canada
• Emergency Management BC	• School District 68
• Errington Fire Department	• Technical Safety BC
• Gabriola Emergency Social Services	• Town of Qualicum Beach
• Gabriola Fire Department	

SESSION 2

Day 1, South Workshop (District 68)

Date: Wednesday, February 20, 2019

Location: Beban Park Social Centre, Nanaimo, BC

Day 2, North Workshop (District 69)

Date: Thursday, February 21, 2019

Location: Eaglecrest Golf Club, Qualicum Beach, BC

Participants

Total attendees: 54

• Alberni-Clayoquot Regional District	• Island Radio
• BC Hydro	• Island Timberlands
• BC Parks	• Mudge Island Citizens Society
• BC Wildfire Service	• Nanaimo Port Authority
• BC Ambulance Service	• Nanaimo RCMP
• Parksville Qualicum Beach Tourism Bureau	• Nanoose Fire Department
• City of Parksville	• Nanoose Naval Base
• Canadian Coast Guard	• Oceanside Emergency Social Services
• Comox Valley Regional District	• Canadian Red Cross
• Coombs-Hilliers Fire Department	• Regional District of Nanaimo
• Cowichan Valley Regional District	• Royal Bank of Canada
• Cranberry Fire Department	• School District 68
• Provincial Dam Safety Officer	• School District 69
• Department of Fisheries and Oceans	• Shunemuxw First Nation
• Emergency Management BC	• Technical Safety BC
• Gabriola Fire Department	• Town of Qualicum Beach
• Health Emergency Management BC	

SESSION 3

Date: Wednesday June 12, 2019

Location: Tigh-Na-Mara Resort & Conference Centre, Parksville, BC

Participants

Total attendees: 43

• Arrowsmith Search and Rescue	• Mudge Island Citizens Society
• BC Hydro	• Nanaimo Port Authority
• BC Wildfire Service	• Nanoose Naval Base
• BC Ambulance Service	• Oceanside Emergency Social Services
• City of Parksville	• Parksville Qualicum Beach Tourism Bureau
• Comox Valley Regional District	• Provincial Dam Safety Officer
• Cowichan Valley Regional District	• Provincial Diking Authority
• Cranberry Fire Department	• Regional District of Nanaimo
• Emergency Management BC	• Royal Bank of Canada
• Environment & Climate Change Canada	• School District 69
• Fisheries & Oceans Canada	• School District 68
• Gabriola Fire Department	• Technical Safety BC
• Health Emergency Management BC	• Town of Qualicum Beach
• Island Radio	• Vancouver Island University

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Icons courtesy of <https://icons8.com>



**Town of Qualicum Beach
FIRE RESCUE DEPARTMENT**

M E M O R A N D U M

TO: Daniel Sailland, CAO **FOR:** Regular Council meeting February 26, 2020

FROM: Marc Norris, Fire Chief

SUBJECT: Monthly Fire Department Report to end of January 2020

PURPOSE

To provide Council with an update regarding Fire Rescue Department activities.

BACKGROUND

The Qualicum Beach Fire Department services the town and surrounding contract areas of the Regional District of Nanaimo. The fire protection area is approximately 34.5 square kilometers, with an estimated population of 10,500. Fire Rescue services include structural and urban interface firefighting, auto rescue, operations level hazmat, operations level confined space and low-angle rope rescue, emergency medical first responder backup to BCEHS and other services.

CALLS FOR SERVICE

Summary for January 2020. Total Calls for Service = 31

0 Bush/Interface	0 Carbon Monoxide Alarm	0 Duty Officer
0 Elevator Rescue	6 Fire Alarm	0 Electrical Fire
8 Medical (First Responder)	0 Smoke in Structure	1 Structure Fire
0 Hazardous Materials	0 Vehicle Fire	8 Hydro
0 Mutual Aid	4 Vehicle Incidents	0 Natural Gas Incident
0 Public Assistance	0 Technical Rescue	4 Assist other Agency

Duty Officer Only: 7 Automatic Aid: 1 Mutual Aid: 0

Incident Hours: 24 hours, 57 minutes Incident Staff Hours: 117 hours, 25 minutes
Average Response Time: 13:12 minutes (Duty Officer: 11.26 | 1st Fire Apparatus: 11.39 min.)
Average Muster/Shoot Time: 7.06 minutes (Based on Main Engine - Engine 52)
Average # of Personnel: 4.0 (Full Time: .2 | On-Call: 3.8)

Summary to end of January 2020 = 31 calls for service.

January 2020	31 incidents	July 2020	00 Incidents
February 2020	00 incidents	August 2020	00 Incidents
March 2020	00 incidents	September 2020	00 Incidents
April 2020	00 incidents	October 2020	00 Incidents
May 2020	00 Incidents	November 2020	00 Incidents
June 2020	00 Incidents	December 2020	00 Incidents

TRAINING

	<i>Sessions</i>	<i>Subjects</i>	<i>Session Hours</i>	<i>Instructor Hours</i>	<i>Staff Hours</i>
<i>Weekly:</i>	7	14	14	56	260
<i>Additional:</i>	11	15	48	13	197
<i>Month Total:</i>	18	29	62	69	457

Training highlights:

- Five members completed air brakes vehicle licensing endorsement. Five members completed Hazmat Operations course. Joint tech rope practice with Coombs on Jan 28. Standard blue card night Jan 14. L58 orientation night Jan 21

APPARATUS/EQUIPMENT/FACILITIES

- Regular ongoing apparatus and equipment checks and service.
- Leak found in fire station Solar Hot Water Pre-Heat Glycol System. Repair cost estimate pending further investigation. This is the second leak found in the system in 2019.

FIRE PREVENTION

28 Inspections | 0 Public Education Events | 0 Fire Investigations | 0 Development Plan Reviews
 7 Pre Incident Plans / Preplan Updates

MEMBERSHIP, RECRUITING AND RETENTION

Paid Members:	3	(one shared with Parksville, 1 Temporary)
Volunteer On-call Members:	26	(excludes special duty and paid staff)
Change from previous month:	-1	(Resigned/Retired 1)
Regular Duty	19	(Special Duty 2)
Recruits	5	
Light / Restricted Duty	2	

- In January, 1 member resigned after accepting a job as a full-time paid firefighter for the City of North Vancouver.
- *****Recruiting** and **retention** of volunteer on-call members is and will be the most significant challenges in the future. While we seem to be able to get recruits, retaining recruits is the real issue. Contributing barriers include lack of time, lack of sufficient jobs, and cost of housing. The ability to retain personnel directly affects the ability to provide for apparatus operators and supervisors, let alone firefighters.

GENERAL

- Annual fit-for-duty medicals were completed



Marc Norris, Fire Chief
 Report Writer



Daniel Sailland, CAO
 Concurrence



TOWN OF QUALICUM BEACH 2020 Construction and Building Permit Report

R E S I D E N T I A L																	
No.	Permit #	Roll #	Civic	Street	Scope of Work	Contractor	# of Units		# of Units Multi	Additions and/or Renos	SFD (new)	Multi (new)	Commercial	Institutional	Industrial	Recreational	Totals
							# of Units SFD	Sec. Suites									
1	5541	660.158	740	Canyon Cres Rd	Accessory Bldg	(self)				\$35,000							
2	5547	444.000	587	Pine St	Duplex	Turner Design			2	\$260,000							
3	5551	98.010	541	Crescent Rd W	SFD & suite	Turner Design			2		\$900,000						
Year to Date as at January 31, 2020							0	0	4	\$295,000	\$900,000	\$0	\$0	\$0	\$0	\$0	\$1,195,000

MONTHLY BYLAW REPORT - January 2020 - DM

AREAS PATROLLED	NUMBER OF PATROLS			VIOLATIONS NOTED DURING PATROLS IN THESE AREAS					
	Foot	Drive	Bike		Animal	Traffic	Signs	Other	Other Notes
Community Park	9	17			6				
Other Parks	2	7							
Community Park Trails	6				4				
Dollymount Trail	4	4							
Heritage Forest Trails	7				3				
Museum Area Trails	8								
Other Trails	6								
Homeless Patrols	3	5							
Town Centre Patrols	21	34				19		20	snow & Ice notices hand delivered
Residential Areas		39			1		3		
Main Beach Patrols	1	10							
Other Beach Patrols									
TOTALS	67	116	0		14	19	3	20	
COMPLAINTS, CALLS, INQUIRIES RECEIVED and ACTIONS / ENFORCEMENT TAKEN									
	Complaints/Calls Received	Voluntary Compliance	Orders / MTI's Removed / Other	Courtesy Tickets Issued	Letters/emails Info sent	Personal visits Follow up/patrols	Notes		
Animal Control	5		1		4	29			
Burning Outdoor	2				2	2			
Business Licence	3	1			3				
Homeless Issues	2	2			2	2			
Illegal Dumping									
Noise	2				2				
Parks / Trails / Beaches									
Sign	2		11				off premise business signs along beachfront		
Traffic	13	9	13	6	7	31	damage to town lamp standard, 4 x snow & ice, 3 MTI's		
Tree Removal	2		2		1				
Unsightly Premises	2	1	1		3	19			
Vandalism	1		1		1	1	stop sign knocked over- located & spoke to driver MTI issued		
Zoning / Building	3				2	3	chickens		
Other	7		3		6	6	request for access to locked Town property denied, plastic bag		
TOTALS	44	13	32	6	33	93	shed encroachment, abandoned bike, rock on drainage grate		

Town of Qualicum Beach
M E M O R A N D U M

TO: Luke Sales, Director of Planning

FOR: Council Meeting, February 26, 2020

FROM: Rebecca Augustyn, Planner

SUBJECT: Development Variance Permit: 333 Judges Row

RECOMMENDATION

THAT Council directs staff to fulfill statutory notification requirements so that Council can consider issuance of a Development Variance Permit for 333 Judges Row at the Council Meeting on March 11, 2020.

PURPOSE

To consider a Development Variance Permit that would reduce the front lot line setback by 2.15m and the interior lot line by 0.2m to permit a cabin with a covered pavilion.

BACKGROUND

The property is zoned Residential 1 (R1) and the proposed cabin is considered to be a dwelling unit, and therefore, is required to meet the principal building setbacks. The R1 zone requires a minimum front lot line setback of 8.0m, a minimum interior side lot line setback of 1.5m, and a minimum setback from the natural boundary of 15.0m; however, since the application was made prior to the housekeeping bylaw being passed, which increased the setback from 8.0m to 15.0m from the natural boundary, the 8.0m setback from the natural boundary is applied. The proposed cabin with covered pavilion has a front lot line setback of 5.85m, which is 2.15m less than the required 8.0m and an interior side lot line setback of 1.3m, which is 0.2m less than the required 1.5m. The proposed cabin with covered pavilion meets the 8.0m setback from the natural boundary.

The cabin has a height of 5.1m, which is within the 9.0m maximum permitted height for principal buildings. The cabin is being extensively renovated at the existing Flood Construction Level (FCL), which is lower than recent recommended FCLs in the area. This is permitted by Provincial guidelines, as long as the owner retains 25% of the value of the structure above the foundation. A small expansion is also permitted at current elevation according to Provincial guidelines. The applicant has confirmed they will be meeting these requirements, and as a result, is permitted to build at current elevation. The outdoor living area does not have the same requirements for FCL.



Figure 1: Subject Property

DISCUSSION

The proposed cabin is approximately 28m² and has a covered pavilion that is attached to the west side of the cabin. Due to the property having a depth of approximately 20m, it would be difficult to build a structure that adheres to the setbacks. In the opinion of staff, it is reasonable to consider a variance.

SUMMARY

The proposed variance for 333 Judges Row would reduce the required interior side lot line setback from 1.5m to 1.3m and the front lot line from 8.0m to 5.85m in order to accommodate an approximately 28m² (299sqft) cabin with an attached covered pavilion. Without the benefit of formal community input, staff recommend Council consider the issuance of a Development Variance Permit at the next Council meeting.

ALTERNATIVES

1. Refuse the Development Variance Permit for 333 Judges Row; or
2. Provide alternative direction to staff.

Rebecca Augustyn
Planner
Report Writer

Luke Sales, MCIP, RPP
Director of Planning
Concurrence

Daniel Sailland
CAO
Concurrence

To who it may concern,

We would like to request a Development Permit Variance for a proposed cabin renovation at 333 Judges Row.

The intent of our proposal is to give functional and programatic upgrades to the existing cabin, while preserving its modest scale, character and context. This necessary 're-purposing' of the outdated building provides it with new life and utility for the property owner.

In order to keep the "scale, character and context" of the existing building we propose modestly raising the floor level to get it out of the ground and provide a superior building envelope around the perimeter. This was done in coordination with City Planning under the condition that the proposed building retains 25% of the existing structure. Our proposed cabin retains 28% of the existing structure. In addition to this, the proposal uses the non-conforming foot print of the existing boathouse and conforms to the maximum height allowance per zoning within the setbacks.

Despite this, there are three instances regarding the proposed design that require your attention.

Instance 1 (South Slope of Proposed Roof):

We request a minor variance for a portion of the proposed roof (exceeding the 8M Setback but within the existing boathouse footprint) surpasses the existing boathouse height by 2'-11". Please refer to the diagrams on Sheet A050 for further clarification.

Instance 2 (East Roof Overhang):

We request a minor variance for the roof overhang on the east side the proposed building. The roof exceeds the 1.5M setback by 7 3/4". Please refer to the diagrams on Sheet A051 for further clarification.

Instance 3 (Open Air Pavilion):

We request a minor variance for a portion of the proposed pavilion that is outside the 8M setback. The proposed pavilion is open on all sides and is intended to provide an outdoor shaded area for the inhabitants. Please refer to the diagrams on Sheet A051 for further clarification.

Thank you for your consideration and we look forward to to your feedback.

Sincerely,



Simon Montgomery

JUDGES ROW CABIN

333 JUDGES ROW, QUALICUM BEACH, BC

A000	COVER PAGE
A050	ELEVATIONS - EXISTING VS PROPOSED
A100	SITE PLAN / STATISTICS
A200	SECTIONS
A300	RENDERING

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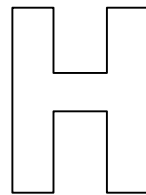
Building Code Note
House is designed under Part 9 of the British Columbia Building Code 2018. The major occupancy classification of the building is Residential 'C'. All work to conform to BCBC 2018.

SMSTUDIO

SUITE 280, 1275 VENABLES STREET, VANCOUVER, BC, V6A 2C9
604.608.5528 / smstudio.ca

ISSUED

01	191001	ISSUE FOR COORDINATION
02	191025	ISSUE FOR BUILDING PERMIT
03	200211	ISSUE FOR DPV



HODGSON DESIGN ASSOCIATES
Suite 360 1650 West 2nd Ave. Vancouver, BC V6J 1H4
tel: (778) 945-1608

JUDGES ROW

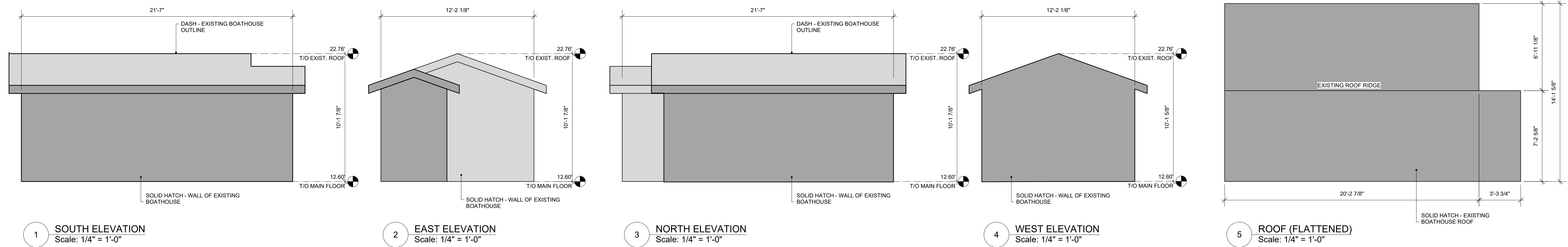
333 JUDGES ROW, QUALICUM BEACH

COVER PAGE

SHEET SIZE	24 x 36
DATE	200211
DRAWN BY	TM/HL
CHECKED BY	SM
SCALE	AS NOTED
JOB NUMBER	1904

A000.

EXISTING BUILDING: WALLS AND ROOF



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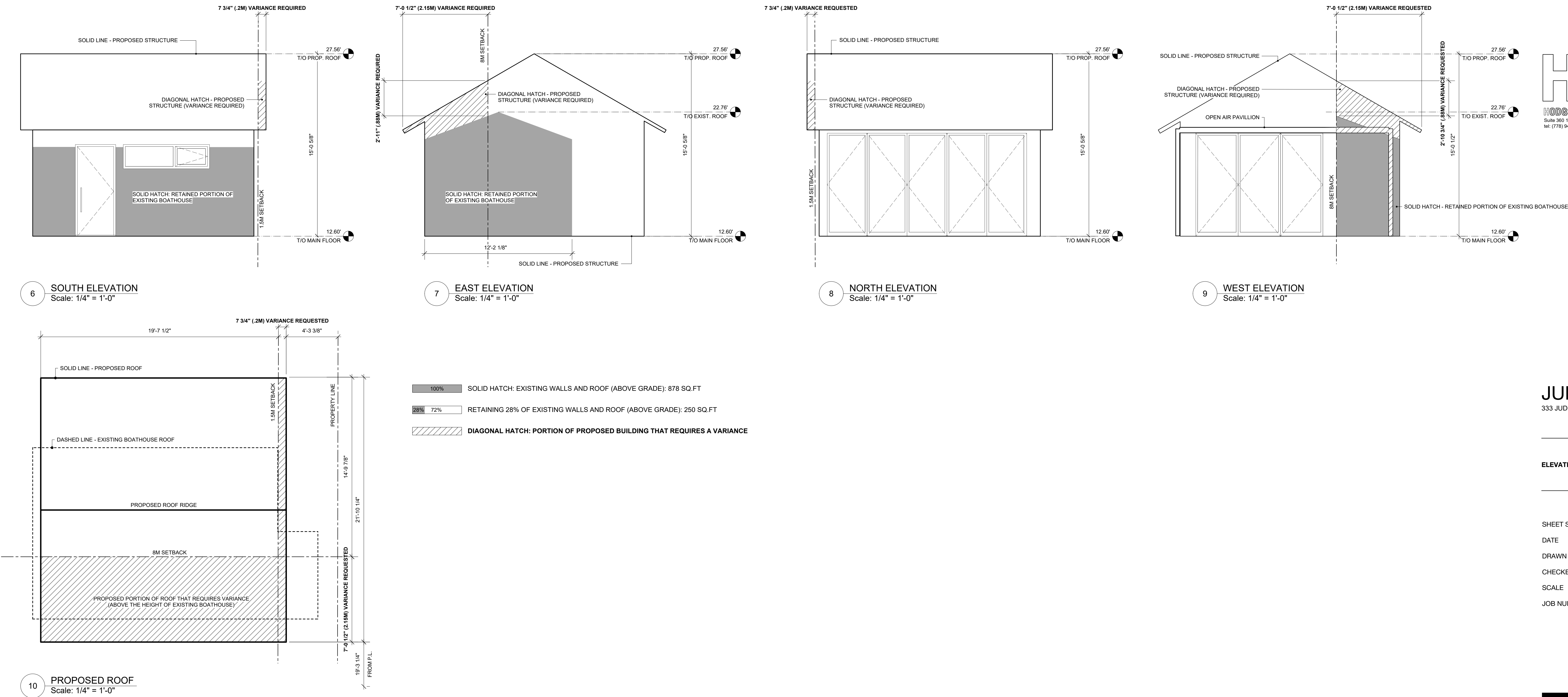
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RETAINED EXISTING BUILDING AND PROPOSED DWELLING OVERLAY



H
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JUDGES ROW
333 JUDGES ROW, QUALICUM BEACH

ELEVATIONS - EXISTING VS PROPOSED

SHEET SIZE	24 x 36
DATE	200211
DRAWN BY	TM/HL
CHECKED BY	SM
SCALE	AS NOTED
JOB NUMBER	1904

A050.

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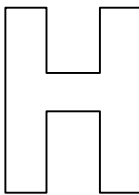
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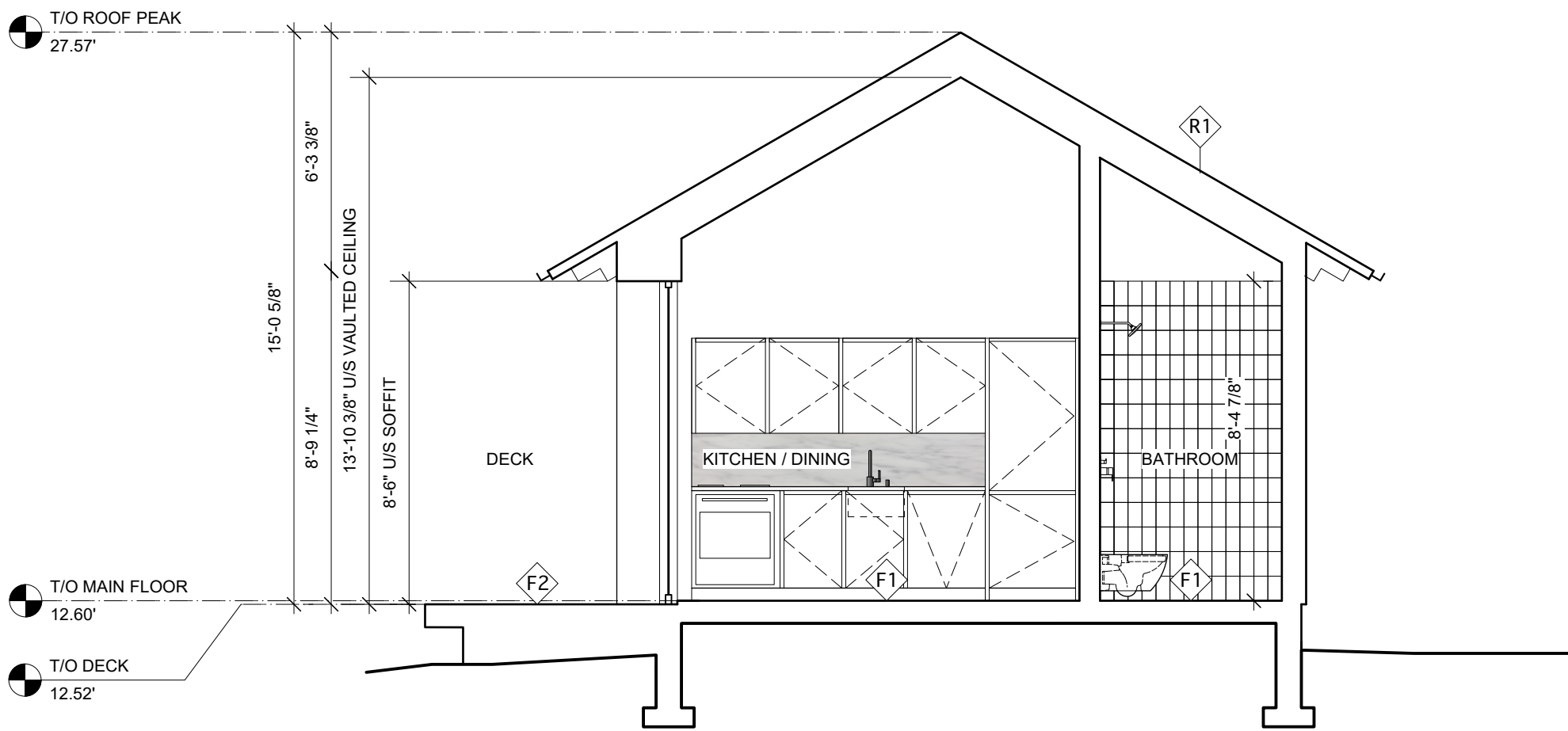
JUDGES ROW

333 JUDGES ROW, QUALICUM BEACH

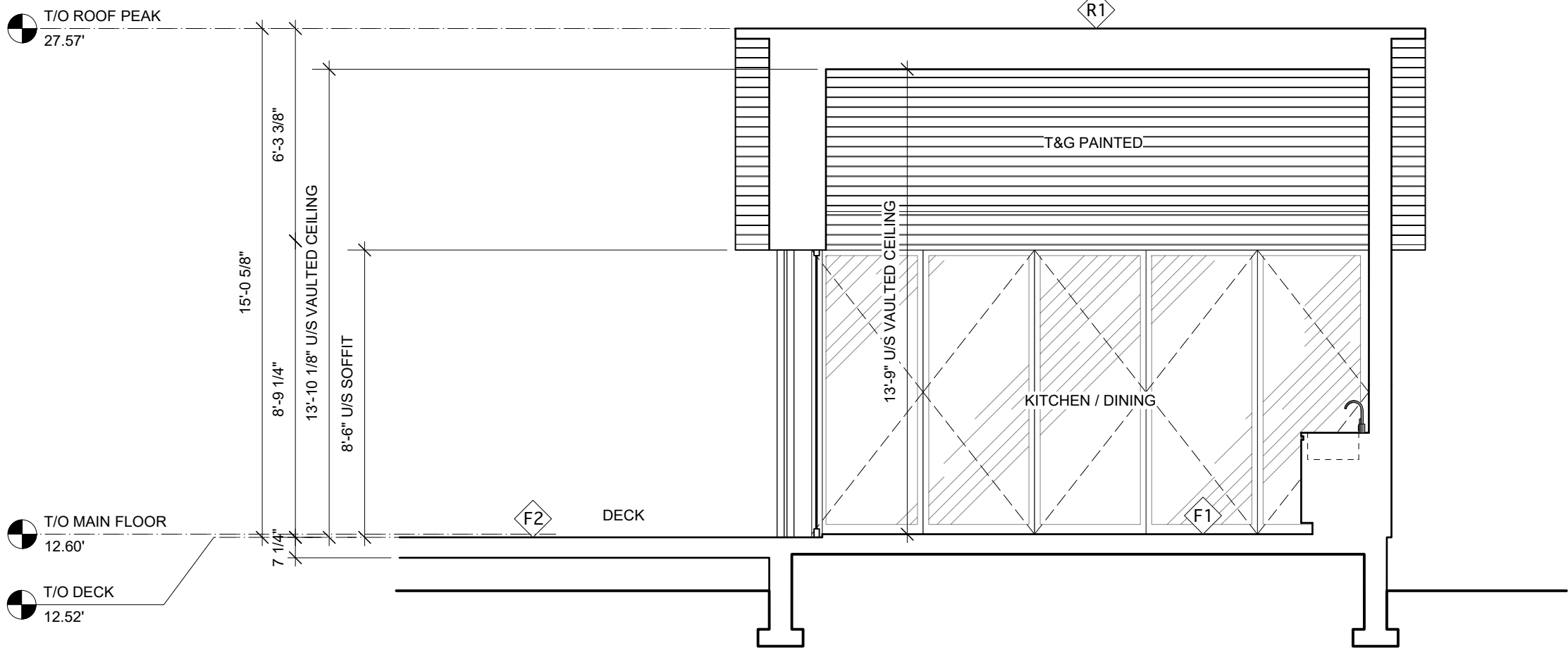
SECTIONS

SHEET SIZE	24 x 36
DATE	200211
DRAWN BY	TM/HL
CHECKED BY	SM
SCALE	AS NOTED
JOB NUMBER	1904

A200.



1 SECTION AA
Scale: 1/4" = 1'-0"



2 SECTION BB
Scale: 1/4" = 1'-0"



1 VIEW FROM JUDGES ROW

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02	191025	ISSUE FOR BUILDING PERMIT
03	200211	ISSUE FOR DPV

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tel: (778) 945-1608

JUDGES ROW
333 JUDGES ROW, QUALICUM BEACH

RENDERING

SHEET SIZE	24 x 36
DATE	200211
DRAWN BY	TM/HL
CHECKED BY	SM
SCALE	AS NOTED
JOB NUMBER	1904

A300.

**Town of Qualicum Beach
M E M O R A N D U M**

TO: Luke Sales, Director of Planning

FOR: Council Meeting, February 26, 2020

FROM: Rebecca Augustyn, Planner

SUBJECT: Development Variance Permit and Development Permit: 217 Higson Crescent

RECOMMENDATION

THAT Council directs staff to fulfill statutory notification requirements so that Council can consider issuance of a Development Variance Permit for 217 Higson Crescent at the Council Meeting on March 11, 2020.

PURPOSE

To consider a Development Variance Permit that would reduce the setback from the natural boundary from 15.0m to 12.42m and increase the maximum height from 9.0m to 11.4m to permit a single family dwelling on the subject property. The Development Permit process does not require notification to residents, and as a result, goes before Council once to be considered. The Development Permit will be brought before Council at the March 11, 2020 Council meeting.

BACKGROUND

The property is zoned Residential 1 (R1), which permits single family dwellings. The R1 zone requires a minimum front lot line setback of 8.0m, a minimum interior side lot line setback of 1.5m, and a minimum setback from the natural boundary of 15.0m. The proposed single family dwelling meets the front setback and the interior lot line setback; however, the setback from the natural boundary is 12.42m, which is 2.58m less than the required 15.0m. The maximum height of a single family dwelling under the R1 zone is 9.0m. The proposed building height is 11.4m, which is 2.4m higher than the maximum permitted.



Figure 1: Subject Property

DISCUSSION

The applicant is proposing to construct a single family dwelling that encroaches into the setback from the natural boundary by 2.58m and is 2.4m higher than the permitted maximum height. While the proposed single family dwelling will encroach into the 15m setback from the natural boundary, the structure will be set back farther from the natural boundary than the existing house and work to implement a green shores approach on the foreshore is proposed. Building height is required to be measured from the natural grade, however, the property is required to meet Flood Construction Levels (FCL). For the subject property, the FCL has been determined to be 5.5m, which is 2.7m higher than the natural grade of 2.80m. The FCL will require the property to be raised by 2.7m. As a result, it would not be feasible to build a two storey structure with a maximum height of 9m measured from natural grade without a variance to the height. In the opinion of staff, it is reasonable to consider a variance.

SUMMARY

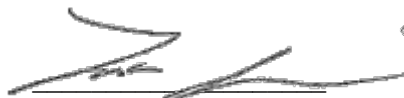
The proposed variance for 217 Higson Crescent would reduce the setback from the natural boundary from 15.0m to 12.42m and increase the maximum height from 9.0m to 11.4m to permit a single family dwelling on the subject property. Staff recommend Council consider the issuance of a Development Variance Permit at the next Council meeting.

ALTERNATIVES

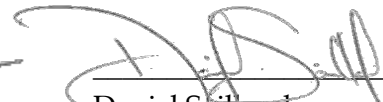
1. Refuse the Development Variance Permit for 217 Higson Crescent; or
2. Provide alternative direction to staff.



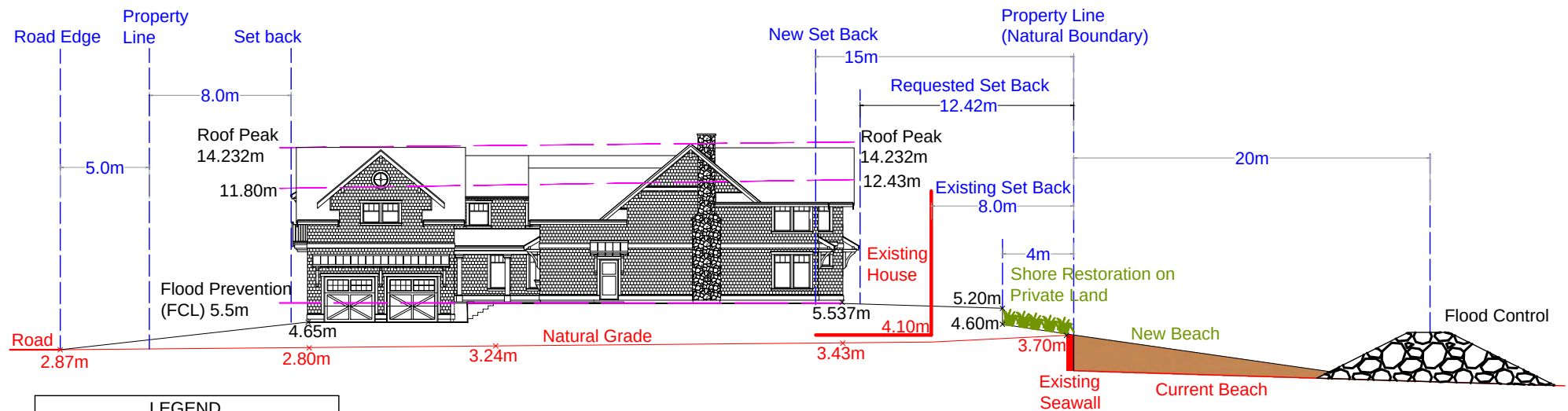
Rebecca Augustyn
Planner
Report Writer



Luke Sales, MCIP, RPP
Director of Planning
Concurrence

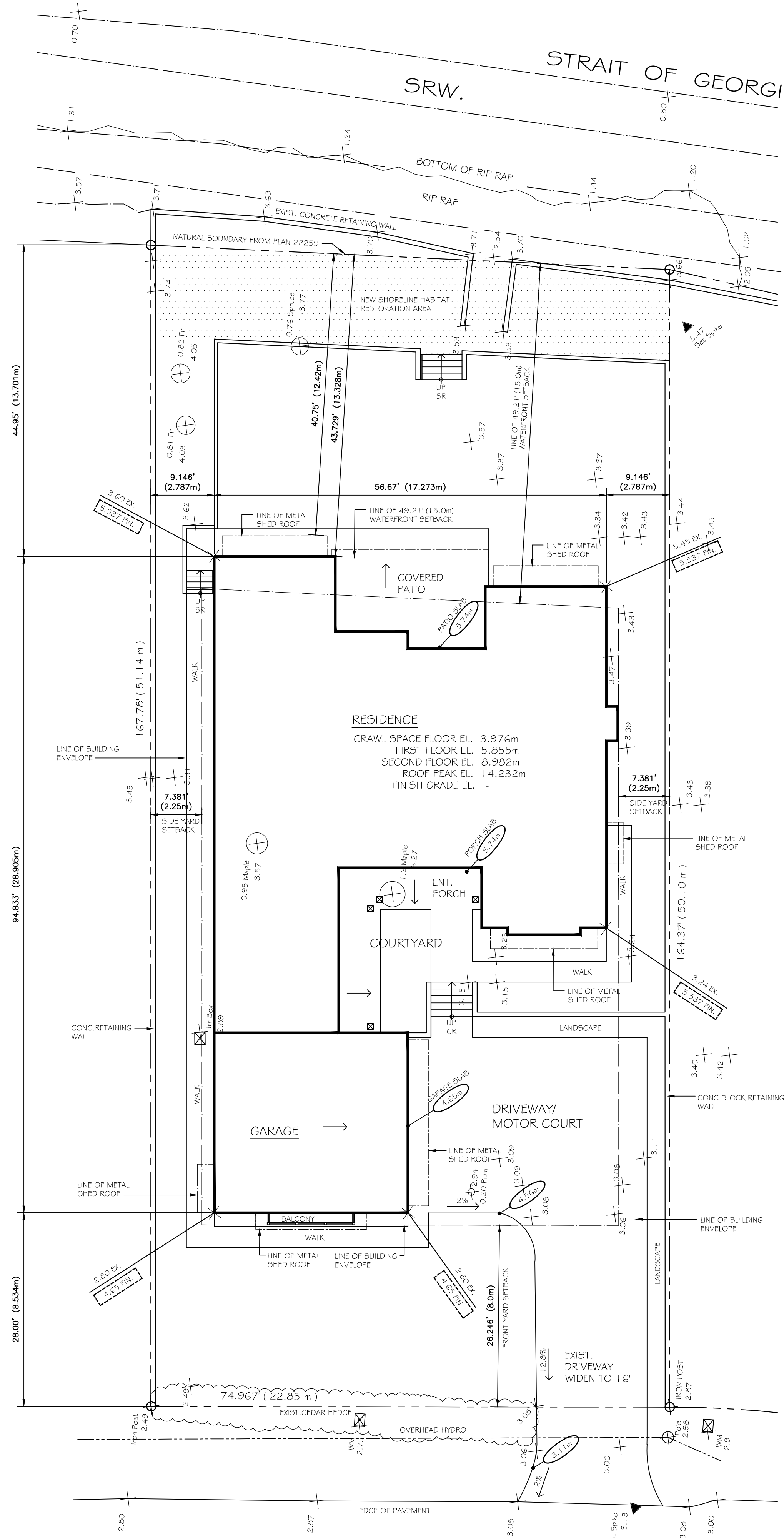


Daniel Salland
CAO
Concurrence

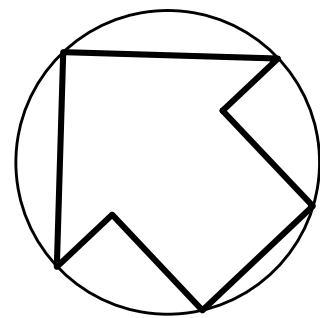


LEGEND
New Structures and Elevations
Existing Structures and Elevations
Distances
Environmental Restoration

217 Higson Crescent
Qualicum Beach
February, 7 2020



217 HIGSON CRESCENT



SITE PLAN

SCALE : 3/32" = 1'-0"

CIVIC ADDRESS

217 HIGSON CRESCENT,
QUALICUM BEACH. BC

LEGAL DESCRIPTION

LOTS 5 & 6, DISTRICT LOT 17,
NEWCASTLE DISTRICT,PLAN 22259

ZONING : RESIDENTIAL I

LOT AREA : 12443.87 SQ. FT.(1156 SQ.M.)

LOT COVERAGE :
PERMITTED: 4355.22 SQ.FT (35%)
ACTUAL: 4174.0 SQ.FT.

BUILDING HEIGHT :
PERMITTED 29.527' (9.0m)
ACTUAL -

- DO NOT SCALE DRAWINGS.
- BUILDER IS TO CHECK AND VERIFY ALL DIMENSIONS BEFORE COMMENCING.
- DIMENSIONS ALWAYS TAKE PRECEDENCE OVER SCALED MEASUREMENTS.
- DIMENSIONS ARE TAKEN TO FACE OF STUD AND CONCRETE OF EXTERIOR WALLS AND TO CENTRE OF STUDS OF INTERIOR WALLS UNLESS NOTED OTHERWISE.
- CONSTRUCTION METHODS ARE TO CONFORM TO THOSE PRESCRIBED BY BRITISH COLUMBIA BUILDING CODE 2018 EDITION OF BCBC.
- SURVEY INFORMATION IS SUPPLIED BY OTHERS. IN EVENT OF DISCREPANCY BETWEEN THESE DRAWINGS AND THE INFORMATION PROVIDED BY THE SURVEYOR, THE DESIGNER MUST BE NOTIFIED IMMEDIATELY.
- ALL MATERIALS ARE TO BE USED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
- PROVIDE TEMPORARY DRAINAGE TO KEEP THE SITE AND WORK WATER FREE AND REINSTATE THE SITE UPON COMPLETION.
- FOOTINGS TO EXTEND BELOW FROST PENETRATION AND MUST REST ON SOLID BEARING. THE QUALITY OF BEARING MUST BE CONFIRMED BY THE AUTHORITY HAVING JURISDICTION.
- LEAVE OPENINGS IN FOUNDATION FOR SERVICES REQUIRED.
- EXPOSED SHEET METAL FLASHING SHALL BE 0.013" GALVANIZED STEEL UNLESS OTHERWISE INDICATED.
- SHEET METAL FLASHING SHALL BE INSTALLED OVER EXISTING OPENINGS.
- WOOD MEMBERS IN CONTACT WITH CONCRETE SHALL BE PROTECTED WITH 459b FELD.
- ROOF TRUSSES TO BE DESIGNED BY OTHERS.
- GLAZING WITHIN 12" OF THE FLOOR SHALL BE IN SAFETY GLASS.
- GLASS IN WINDOWS & DOORS TO BE DOUBLE GLAZED ALL WINDOW FRAMES TO BE THERMALLY BROKEN AND SHALL COMPLY REQUIREMENT OF 2018 BCBC SECTION 9.36.2.7.
- GLASS SIDE LITES & WINDOWS WITHIN 36" OF DOOR LOCKS ARE TO BE SAFETY GLASS.
- GLASS SIDE LITES GREATER THAN 20" IN WIDTH THAT COULD BE MISTAKEN FOR DOORS, TO BE SAFETY GLASS.
- GLASS IN WINDOWS LESS THAN 8" ABOVE FIRM FLOOR IS TO BE SAFETY GLASS.
- GLASS IN ENTRANCE, SHOWER AND IN SLIDING DOORS TO BE SAFETY GLASS.
- ALL BATHTUBS TO BE WATERPROOFED TO A MINIMUM HEIGHT 5'-0" ABOVE FLOOR LEVEL.
- ALL EXPOSED METAL (FLASHINGS, VENTS, DOWNSPOUTS, ETC.) SHALL BE PAINTED TO MATCH ADJOINING FINISH AS CLOSELY AS POSSIBLE.
- WOOD FASCIA'S AND BARGE BOARDS SHALL BE STAINED ON ALL SURFACES, INCLUDING ALL ON-SITES SAW OUT ENDS.
- ENCLOSED ROOF AND ATTIC SPACES SHALL BE VENTED IN ACCORDANCE WITH RELEVANT CODES (NOT LESS THAN 1/300 OF CEILING AREA).
- ROOF VENTS MUST BE UNIFORMLY DISTRIBUTED WITH A MINIMUM OF 25% IN EAVE AND 25% IN ROOF TOP.
- NATURAL VENTILATION OF ENCLOSED CRAWL SPACES SHALL BE PROVIDED IN ACCORDANCE WITH THE RELEVANT CODES (NOT LESS THAN 1/500 OF CRAWL SPACE AREA AND AS EVENLY DISTRIBUTED AS POSSIBLE).
- VAULTED CEILINGS SHALL BE VENTILATED TO 1/150 OF INSULATED CEILING AREA. INSULATION SHALL BE 1" BELOW TOP OF JOISTS.
- CAULK ALL EXTERIOR OPENINGS.
- PLUMBING INSTALLATIONS SHALL BE IN ACCORDANCE WITH B.C.B.C. AND ALL OTHER PLUMBING CODES.
- THE DESIGN AND INSTALLATION OF THE HEATING, VENTILATION & AIR CONDITIONING SYSTEMS SHALL BE IN ACCORDANCE WITH B.C.B.C. AND SHALL BE OTHER TYPE NOTED ON THE DRAWINGS AND SHALL COMPLY WITH THE REQUIREMENTS OF 2018 BCBC SECTION 9.36.3.
- THE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE B.C.B.C. AND ALL APPLICABLE CODES.
- THE BOTTOM OF AN OPENABLE WINDOW IN A BEDROOM IS NOT TO EXCEED 4'-11" ABOVE THE FLOOR LEVEL AND HAVE A MINIMUM OPENING DIMENSIONS OF 15" WITH AN AREA OF 3.75 SQ. FT.
- HANDRAIL ACTING AS A GUARD IS TO BE BETWEEN 36" AND 38".
- WATERPROOF WALLBOARD REQUIRED AS THE BASE AROUND TUBS AND SHOWERS #9.29, 10.4 B.C.B.C.
- R-12 RIGID INSULATION UNDER ENTIRE SLAB WITH RADIANT HEAT.
- NO MEMBER FACILITATING CLIMBING PERMITTED FROM 4" TO 36" ABOVE THE FLOOR OR WALKING SURFACE (ALL GUARDS).
- MAXIMUM 4" OPENING IN ALL STAIR, DECK AND BALCONY GUARDS (INTERIOR & EXTERIOR) EXCEPT SPACE BETWEEN BOTTOM RAIL AND STAIR TREAD.
- PROVIDE 6" CLEARANCE BETWEEN GRADE AND SIDING.
- WALL TIES FOR MASONRY REQUIRED IN CONFORMANCE WITH #9.20.9, A B.C.B.C.
- REVIEW STANDARDS FOR DWELLING SECURITY AS OUTLINED IN #9.6.6, B.C.B.C.
- N.E.F. HINGES REQUIRED FOR OUT SWINGING EXTERIOR DOORS.
- SPRINKLER SYSTEM TO BE DESIGNED, CONSTRUCTED, INSTALLED AND TESTED IN CONFORMANCE WITH NFPA 13D INSTALLATION OF SPRINKLER SYSTEM RESIDENTIAL OCCUPANCIES.
- INSULATION WHERE SUBJECT TO MECHANICAL DAMAGE TO BE COVERED AS PER B.C.B.C. #9.25.2.3 (7).
- UNOLEUM OR EQUAL REQUIRED TO BATHROOM FLOORS, CONTINUOUS OR INTERMITTENT EXHAUST FANS TO ALL BATHROOMS AND KITCHENS.
- ONE HARD WIRED SMOKE ALARM REQUIRED PER FLOOR. ALL SMOKE ALARMS TO BE INTERCONNECTED.
- SMOKE ALARMS REQUIRED ON EVERY FLOOR LEVEL WITHIN 5.0m OF BEDROOM DOOR AND 15.0m OF EACH OTHER.
- A 5b A.B.C. DRY CHEMICAL FIRE EXTINGUISHER IS REQUIRED NEAR THE KITCHEN.
- SECURE HOT WATER TANK TO PREVENT OVERTURNING.
- ALL NEW DOORS AND WINDOWS AND THEIR INSTALLATION SHALL COMPLY WITH NEW NAPS STANDARDS AND SPECIFICATIONS. SEE 9.7.4 OF THE 2018 BCBC.
- THE LEAKAGE OF AIR INTO AND OUT OF CONDITIONED SPACES SHALL BE CONTROLLED BY CONSTRUCTING A CONTINUOUS AIR BARRIER SYSTEM AS SPECIFIED IN 2018 BCBC 3.36.2.9.
- CONSTRUCTION OF AIR BARRIER DETAILS SHALL COMPLY WITH 2018 BCBC 9.36.2.10.
- SERVICE WATER HEATING SYSTEMS SHALL COMPLY WITH 2018 BCBC 9.36.4.
- MECHANICAL ELECTRICAL AND PLUMBING COMPONENTS PLACED WITHIN AN EXTERIOR WALL MUST BE INSULATED BEHIND TO THE EFFECTIVE THERMAL RESISTANCE SPECIFIED IN SECTION 9.36.2.6, AND 9.36.2.6.
- WALLS AND CEILINGS SEPARATING CONDITIONED SPACES FROM ATTACHED GARAGE ARE TO COMPLY WITH EFFECT THERMAL RESISTANCE MINIMUMS AS SPECIFIED IN SECTION 9.36.2.6, AND 9.36.2.6. (EVEN IF GARAGE IS HEATED AND INSULATED.)



oscar woodman design

1782 view st., port moody.

british columbia.V3H3Y2

604-937-7640

project title

RESIDENCE - HODGE

217 HIGSON CRESCENT
QUALICUM BEACH, BC.

sheet title

SITE PLAN

issued: Feb. 18 2020

date: Dec. 2019 issue: revision

job no.

drawn ed chkd.

scale: 3/32" = 1'-0"

sheet no.

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of
11



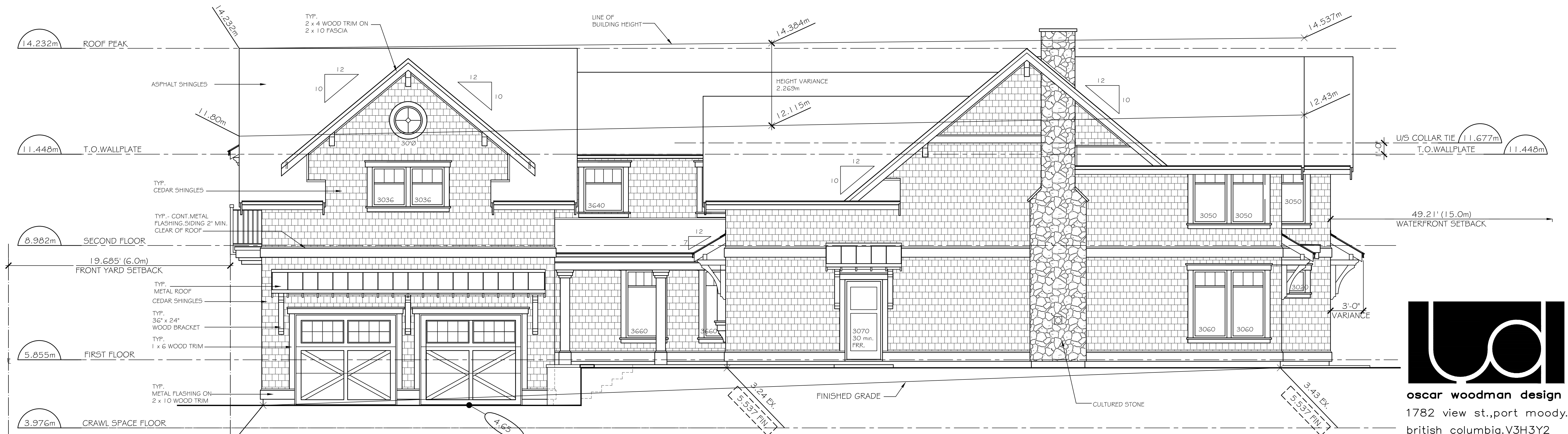
oscar woodman design
1782 view st.,port moody.
british columbia.V3H3Y2
604-937-7640

project title
RESIDENCE - HODGE

217 HIGSON CRESCENT
QUALICUM BEACH, BC.
sheet title
SOUTH ELEVATION
EAST ELEVATION

issued:	Jan.28 2020
date:Dec.2019issue.revision	
job no.	
drawn ed	chkd.
scale:1/4" = 1'-0"	
sheet no.	

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of
11



SPATIAL SEPARATION CALCULATIONS	
LIMITING DISTANCE	7.313' (2.228m)
EXPOSED BUILDING FACE	829.54 SQ.FT.
PERMITTED OPENINGS	78.81 SQ.FT. (9.5 %)
ACTUAL OPENINGS	61.70 SQ.FT.



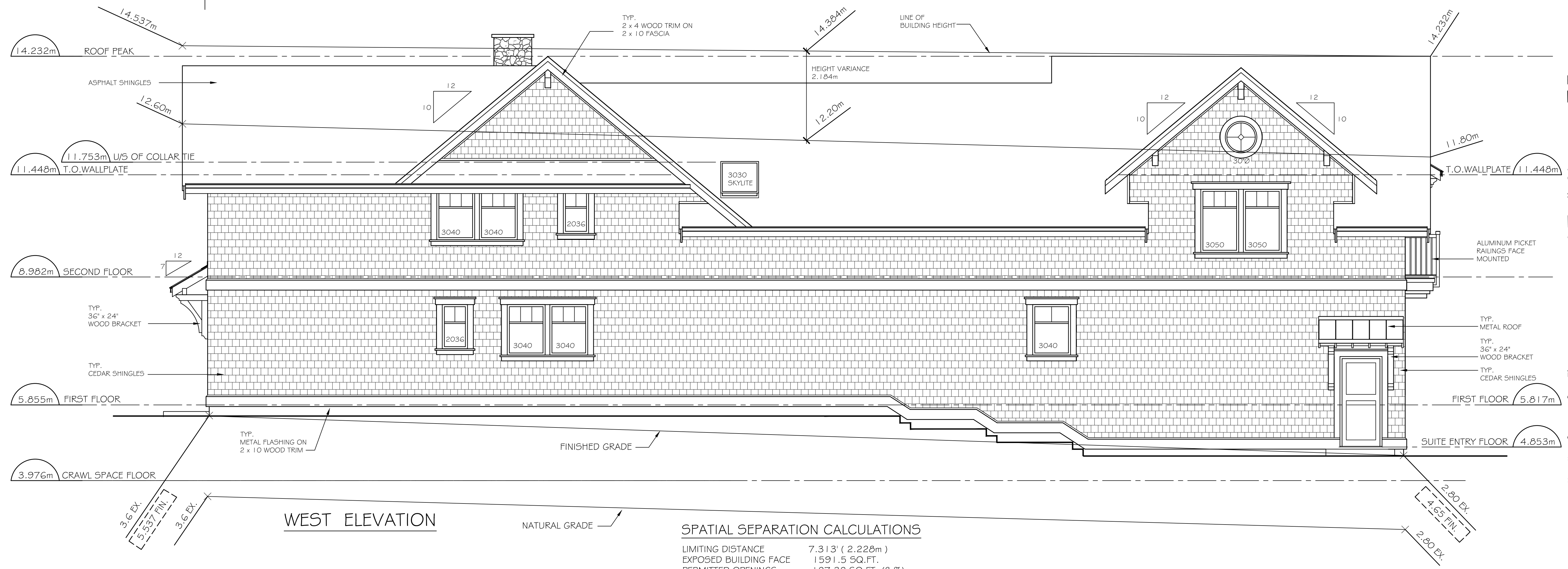
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project title
RESIDENCE - HODGE

217 HIGSON CRESCENT
QUALICUM BEACH, BC.
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SOUTH ELEVATION
EAST ELEVATION

issued:	Jan.28 2020
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1782 view st.,port moody.
british columbia.V3H3Y2
604-937-7640

project title
RESIDENCE - HODGE

217 HIGSON CRESCENT
QUALICUM BEACH, BC.

sheet title

NORTH ELEVATION

WEST ELEVATION

issued: Jan.28 2020

date:Dec.'2019 issue.revision

job no.

scale: 1/4" = 1'-0"

sheet no.

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Age-Friendly Transportation Plan

2019 Update

Town of Qualicum Beach

27 December 2019

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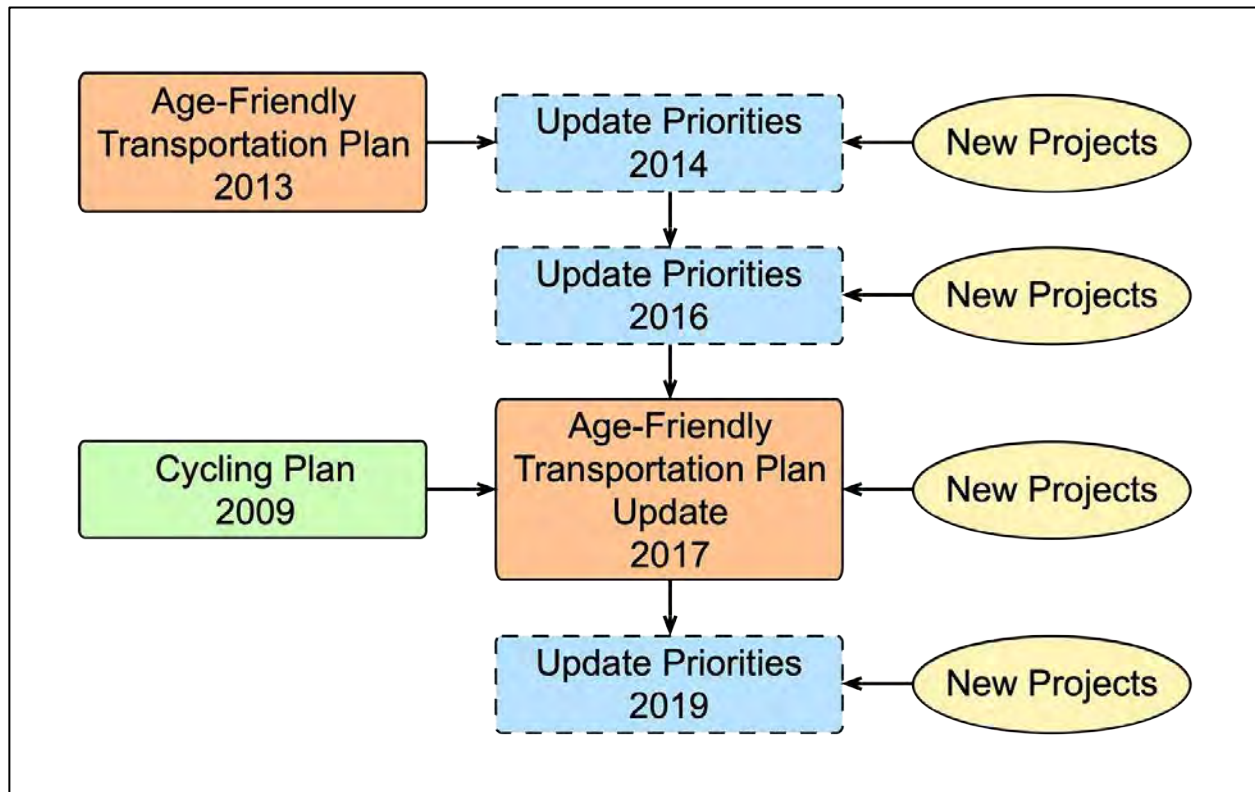
1 Introduction

The Town of Qualicum Beach wishes to maintain and improve mobility and safety for persons of all ages and abilities, particularly for those who chose active modes of transportation, such as walking and cycling. To accomplish this, the Town adopted an Age-Friendly Transportation Plan, a key component of which is a prioritized list of transportation projects throughout the community. Projects ranked as the highest priority are those that will best achieve the Town's objectives for mobility and safety, and provide the greatest "return on investment."

These priorities are intended to provide a basis for Town staff, decision makers, stakeholders and others to plan, budget and implement transportation projects. They are not intended to be "cast in stone." Rather, it is expected that the list of priorities will be updated every year or two as conditions change and some projects are completed.

This document presents the fourth review and update of the transportation priorities. As shown in Figure 1.1, the Age-Friendly Transportation Plan was adopted in 2013, two updates of the priorities were undertaken in 2014 and 2016, and the plan was updated and expanded in 2017 to incorporate new projects and a network of pathways and bicycle routes. In the past two years, some projects have been completed and new transportation issues have arisen. Given these changes, it is timely to re-evaluate transportation priorities and consider additional projects that have been proposed since the plan was updated.

Figure 1.1: Age-Friendly Transportation Plan timeline



1.1 Goals

Two goals were established for the Age-Friendly Transportation Plan, as well as several supporting objectives. The goals of the plan are:

- *Improve mobility* by active transportation modes. The primary goal of the Age-Friendly Transportation Plan is to improve mobility by walking, cycling and transit. Improving existing facilities for pedestrians and cyclists and developing new facilities will improve mobility for active transportation modes, and increase the number of trips by walking, cycling and transit
- *Improve safety* for vulnerable road users. A significant deterrent to walking and cycling is “fear of traffic.” Improving safety by improving the design of pedestrian and bicycle facilities will not only help to minimize conflicts between pedestrians, cyclists and other road users and reduce injuries, but will also reduce the fear of traffic for vulnerable road users, increasing the number of active transportation trips.

1.2 Criteria

The following criteria are used to assess and prioritize transportation projects. Further details as to how the criteria are applied are provided in the Age-Friendly Transportation Plan (November 2017).

- *Safety* provides a measure of the relative improvement in safety associated with a project.
- *Use* provides a measure of the current use and potential future use if the facility is improved.
- *Vulnerable users*. This criterion provides a measure of the use of a facility by pedestrians, cyclists, seniors, children, persons with disabilities and other vulnerable users.
- *Network contribution* provides a measure of the relative contribution of a project within the overall transportation network. The contribution of a facility is considered in terms of directness of access and proximity to alternative facilities.
- *Cost* reflects the anticipated capital and operating costs associated with a project. Ratings are based on an estimate of order-of-magnitude costs, and include the potential for funding from other agencies to reduce the Town’s costs.
- *Other*. This criterion reflects other factors that could increase or decrease the priority of a project, including, for example, the appeal of a facility to users, support for other Town objectives, opportunity to advance the project (or defer it) by combining it with another municipal project, dependency on redevelopment of adjacent properties, property acquisition requirements, regulatory or legislative obstacles, and community support or opposition.

1.3 Completed Projects

Since the original Age-Friendly Transportation Plan was adopted in 2013, the following projects have been completed and removed from the list of transportation priorities:

- Pedestrian countdown displays at the Memorial/Fern intersection.
- An overhead illuminated crosswalk on Fern Road at Quality Foods.
- Special crosswalks with pedestrian-activated flashing lights on:
 - o Village Way at Hemsworth Road.
 - o Berwick Road at Veterans Way, incorporating a median island
 - o Highway 19A at Bay Street.
 - o Memorial Avenue at Garden Road, incorporating curb extensions.
 - o Laburnum Road at Claymore Road.
 - o Bennett Road at Cardinal Way south of Arrowview Elementary School. This crossing incorporates RRFB flashing lights, that flash in a wig-wag pattern similar to the flashing lights on emergency vehicles. RRFBs have been shown in studies to be more effective at alerting motorists and encouraging them to stop for pedestrians in a crosswalk than conventional flashing lights.
- Realignment of the Village Way and Crescent Road intersections at Memorial Avenue.
- A roundabout at the Highway 19A/Memorial Avenue intersection is under construction and will be completed in 2020.
- A reconfigured right turn lane from eastbound Village Way to eastbound Hwy 19A to address safety issues and reduce the incidence of collisions.
- A left turn lane on Rupert Road at Berwick Road

The following active transportation projects identified in the original Cycling Plan and in the updated Age-Friendly Transportation Plan have been completed:

- The Dollymount Trail multi-use pathway between Berwick Road and Qualicum Road. The route continues east to Bennett Road along Fern Road, which is a low-traffic, low-speed road.
- The Memorial Trail multiuse pathway on Memorial Avenue extending from the downtown to the waterfront.
- The School Connector multi-use pathway between Laburnum Road and Hoylake Road West along the north side of the E&N rail line.
- An accessible pathway in the Hemsworth Road right-of-way north of Village Way to Chester Road.

2 Projects

This section describes updates, changes and additional information for projects that are already in the Age-Friendly Transportation Plan, and identifies several new projects to be added to the list of transportation priorities. Several of the new and updated projects were identified through feedback from the community at presentations held on 30 October at the Civic Centre.

2.1 Updates to Current Projects

There are updates to several multiuse pathway projects:

- *Dollymount Trail.* A preferred alignment for the extension of the Dollymount Trail has been identified, as illustrated in Figure 2.1. The pathway would be extended west from Berwick Road to Memorial Avenue along the south side of the rail line, either within the E&N right-of-way or along the north edge of the proposed East Village redevelopment. A new traffic signal at the Memorial Avenue/First Avenue intersection would facilitate the connection to the Downtown Trail (see below for more discussion of these other projects).

Figure 2.1: Dollymount Trail extension, Berwick Rd.–Memorial Ave.



- *Downtown Trail.* The preferred alignment for this new pathway is on Harlech Road or in the railway right-of-way, as illustrated in Figure 2.2. The pathway would be developed in conjunction with redevelopment of adjacent properties, particularly the old fire hall site, and would incorporate a connection to the future bicycle route on Primrose Street.

Figure 2.2: Downtown Trail alignment, Memorial Ave.–Beach Rd.



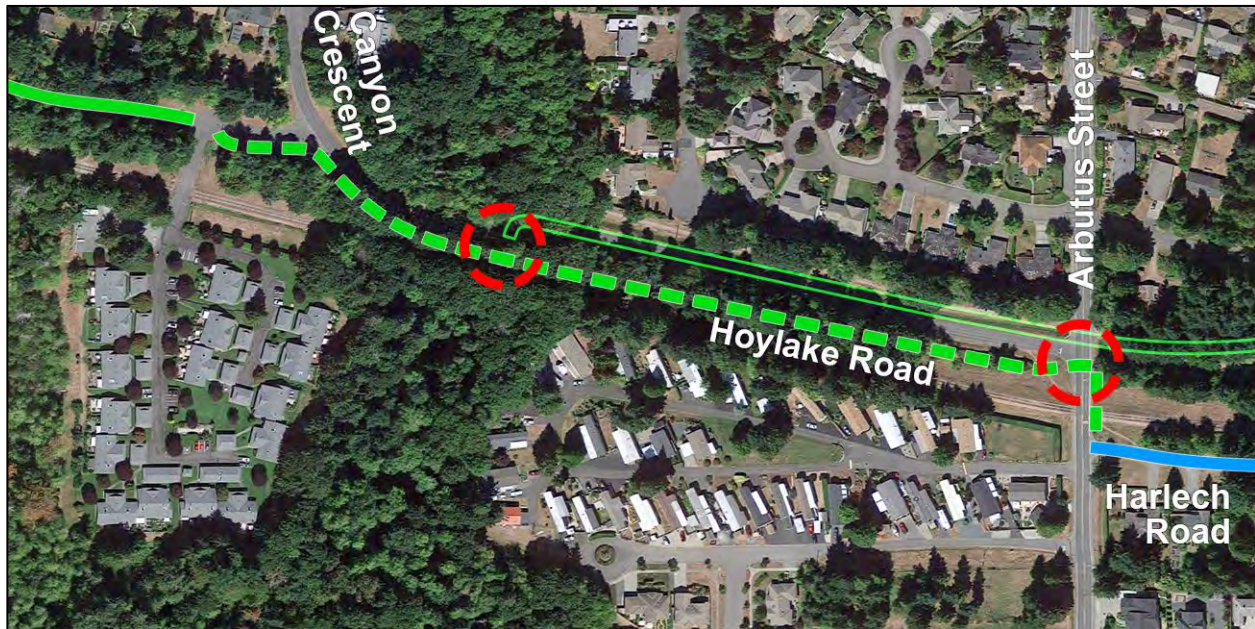
- *Harlech Trail.* The pathway would be located on the north side of the Harlech Road right-of-way as shown in Figure 2.3, avoiding existing driveways east of Cedar Street. This project is funded and will be completed by March 2020.

Figure 2.3: Harlech Trail alignment, Beach Rd.–Cedar St.



- *Hoylake Trail.* The alignment of the pathway is between the rail line and Hoylake Road, as shown in Figure 2.4. This project is funded and will be completed by March 2020. A new multi-use crossing east of the ravine connects to the soft-surface trail on the north side of Hoylake Road, and a future multi-use crossing at Arbutus Street would connect to the neighbourhood bikeway on Harlech Road and the existing Museum Trail.

Figure 2.4: Hoylake Trail alignment, Arbutus St.–Grandon Cr.



Updates to other projects include:

- *Traffic signal at Memorial Avenue/First Avenue.* Because of the proximity of the intersection to the railway tracks, the traffic signal must be integrated with the rail crossing signals, which increases the cost of the signals and complexity of the intersection design and operation. There would be no need for additional rail crossing features if the rail line was no longer considered “active,” and consequently the Town may wish to delay signalization and upgrades of the Memorial Avenue/First Avenue intersection if there is the possibility of a change in the status of the rail line.
- *Close Railway Street at Memorial Avenue.* A full closure is the preferred means of addressing the safety issues created by the obstructed sight line to the north. A study undertaken in 2001 also identified a closure as the preferred solution, and at the time, ICBC was willing to fully fund the project. As illustrated in Figure 2.5, a cul-de-sac closure would eliminate approximately 4 parking stalls.

Figure 2.5: Railway St. closure at Memorial Ave.



- *Highway 19A.* Safety for pedestrians and cyclists is an issue on sections of Highway 19A along the waterfront. Because there is no walkway along the waterfront in some sections, pedestrians walk along the north side of Highway 19A. Cyclists use the shoulder of the road, and there are typically several vehicles parked on the north side of the road, as shown in Figure 2.6. In several locations there is not adequate width to safely accommodate pedestrians, cyclists and parked vehicles.

Speeding is also an issue along the waterfront on Highway 19A. The Town should undertake a study to identify safety improvements and traffic calming measures that could be implemented on Highway 19A to address pedestrian and cyclist safety, speeding and other safety issues. The study should engage property owners and other stakeholders, as well as the broader community, to consider options that improve safety while minimizing impacts to waterfront users and adjacent properties, including options to maintaining parking for residents and businesses.

In the interim, in locations where there is less than 4.0 m of width between fences or other objects and the fog line on the road, the Town should prohibit parking by installing “No Parking” signs to ensure that adequate width is available for pedestrians and cyclists to safely walk and ride. One such section is from #2919 to #3035, which is illustrated in Figure 2.7, and another is from #3245 to #3285 where there is angle parking in front of several motels.

Figure 2.6: Pedestrian and parked vehicles on shoulder, Highway 19A



Figure 2.7: Prohibit parking on shoulder less than 4 m wide, Highway 19A



- *Traffic circles on Primrose Street and Beach Road*, at the locations indicated in Figure 2.8. Traffic circles are the preferred form of intersection control, and would address safety problems resulting from non-compliance with the existing all-way stop signs. As well, a new neighbourhood bikeway is planned for Primrose Street, and traffic circles would improve safety for cyclists at these intersections.

Where possible, the Town should implement traffic circles on a temporary basis, as shown in Figure 2.9. This provides the opportunity to confirm that the traffic circles function as intended, and to adjust the geometry if needed before they are constructed to a permanent standard.

Figure 2.8: Traffic circles, Primrose St. and Beach Rd.

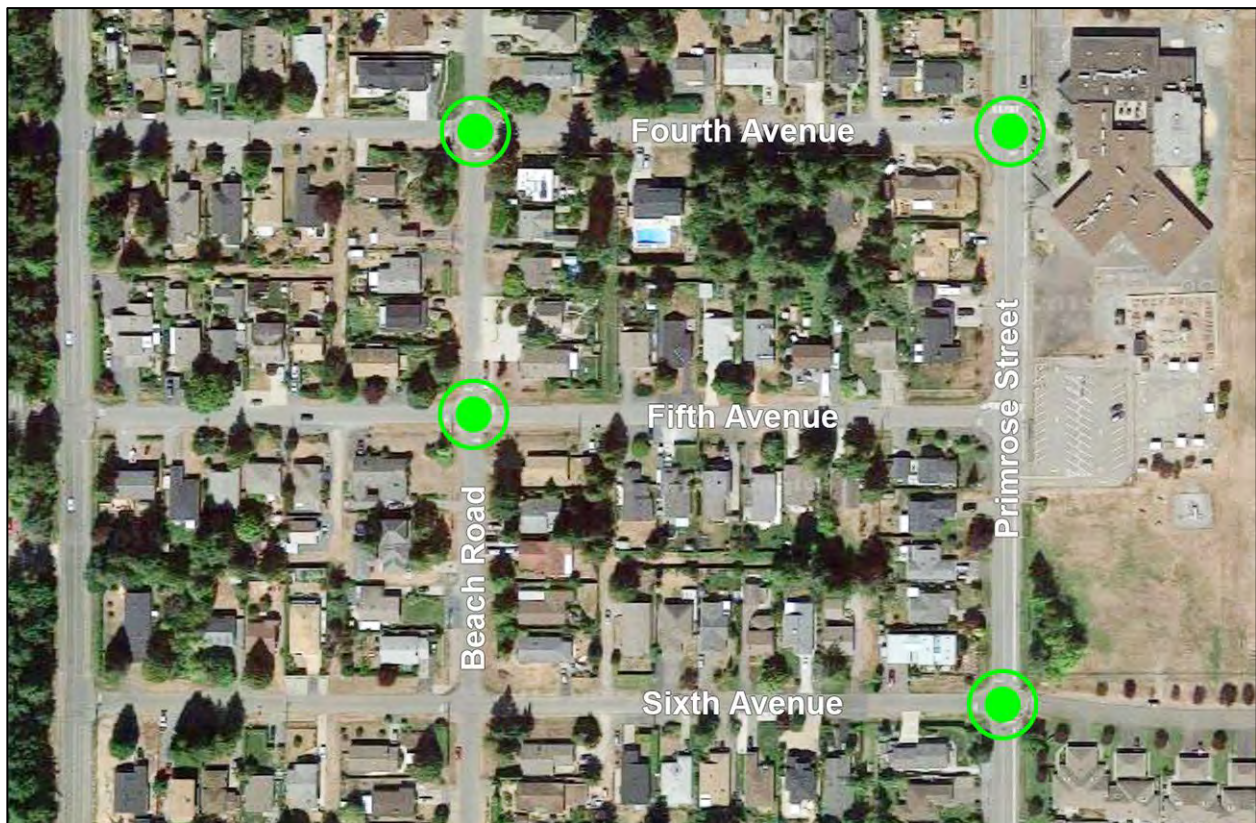


Figure 2.9: Temporary and permanent traffic circles



2.2 New Projects

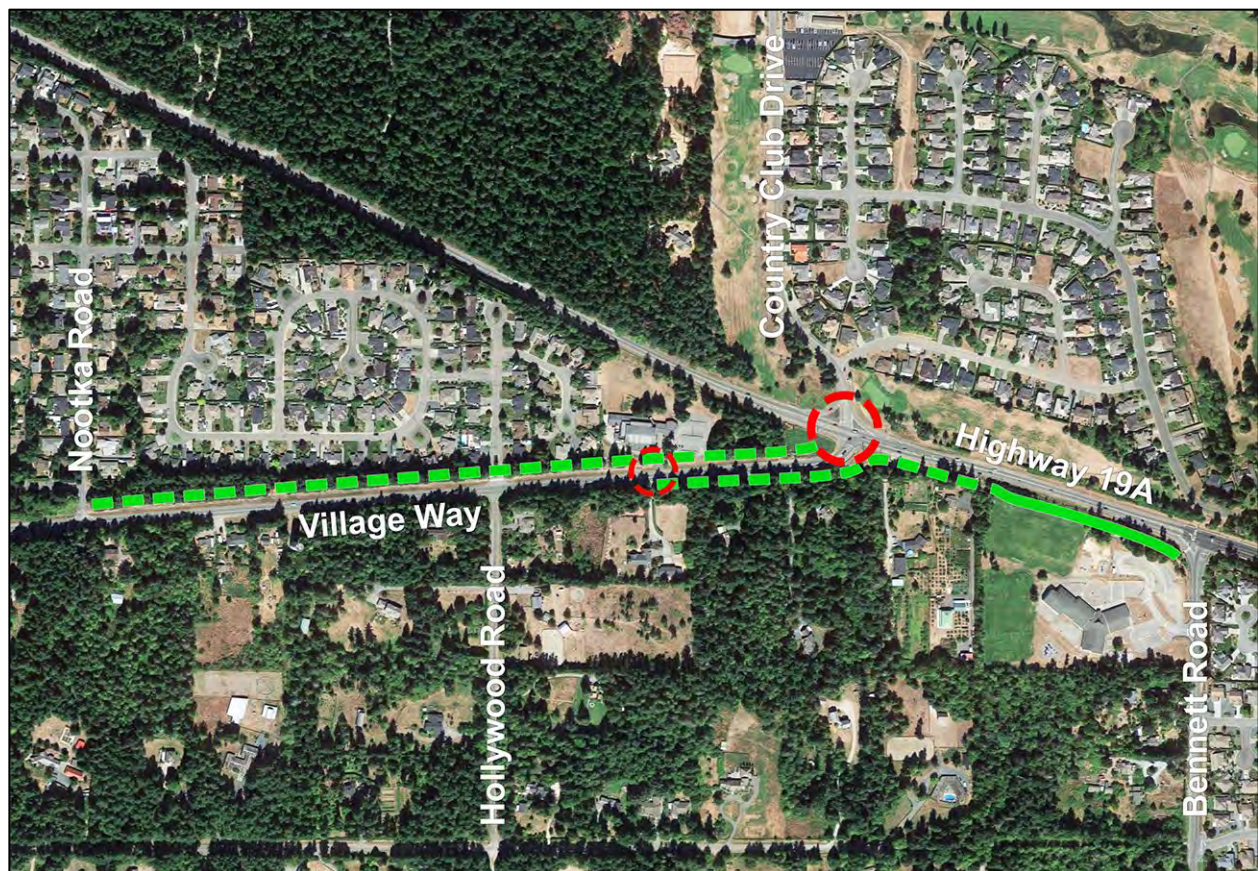
The following projects have been added to the Age-Friendly Transportation Plan as part of the 2019 update:

- *The Rodway Trail* connects the north end of Arbutus Street to Highway 19A, and is a popular access route to the waterfront. The pathway was closed recently due to encroachment on private property, and the Town has developed a design for a new stairway that would connect Arbutus Street to the remainder of the pathway within the Arbutus Road right-of-way.

Associated with this project is a new flashing light crossing on Highway 19A where the pathway terminates to the west of the Shady Rest pub and liquor store.

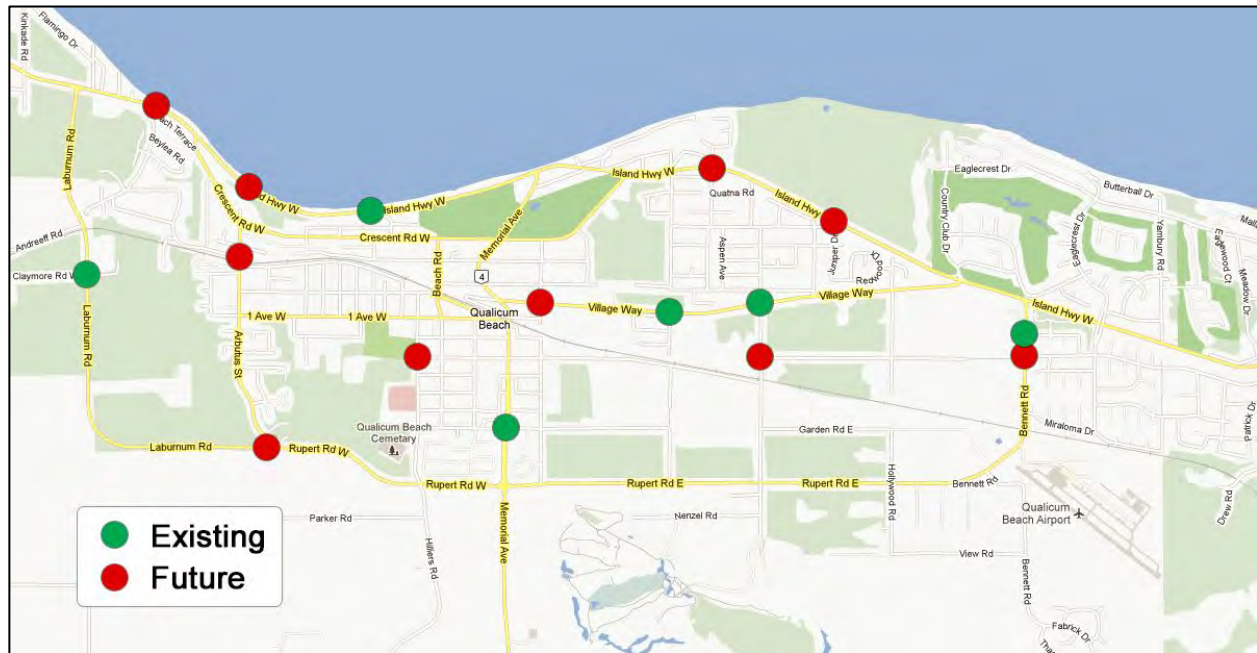
- *The Village Way Trail*. As shown in Figure 2.10, this new pathway would extend from Nootka Road to the new roundabout at Highway 19A, and would continue east to connect to the existing pathway on the north side of the Arrowview Elementary School site. The pathway would replace an existing soft-surface trail on the north side of Village Way west of the Christian fellowship Centre, and on the south side to the east.

Figure 2.10: Village Way Trail, Nootka Rd.–Highway 19A



- *Flashing light crossings* incorporating flashing amber lights activated by pedestrians. Four new locations for flashing light crossings are identified on Highway 19A to improve safety for pedestrians crossing in these locations: at Hall Road, at Milner Gardens (Juniper Drive), at Garrett Road or Beach Terrace, and at the north end of the Broadway Trail on the west side of the Shady Rest pub and liquor store. These are shown in Figure 2.11 along with existing flashing light crossings and future locations previously identified in the Age-Friendly Transportation Plan.

Figure 2.11: Flashing light crossings



- A *speed display sign* on Bennett Road at Arrowview Elementary School to alert southbound motorists to the 30 km/h school zone speed limit in effect from 8:00 am to 5:00 pm on school days. Some motorists turning onto Bennett Road from Highway 19A drive through the school zone at speeds well in excess of the 30 km/h limit.

Two speed display signs are illustrated in Figure 2.12. The sign is programmed to flash a message when an approaching motorist is travelling above a predetermined speed, such as above 35 km/h. The sign at right is the preferred style of sign, as it simply displays the speed limit and warns the motorist to slow down, rather than displaying the motorist's speed which could lead to complaints about inaccurate speed measurements and attempts by some motorists to see how fast they can go.

Figure 2.12: Speed display signs



- *Parking on Elizabeth Street* east of Memorial Avenue, in the vicinity of the Qualicum Beach Inn. As shown in Figure 2.13, parked vehicles reduce the available road width for cyclists and motorists, and force pedestrians to walk in the road. To improve safety for all road users, the Town should improve the shoulders to accommodate parked vehicles. To ensure an adequate turnover of parking and discourage overnight parking by hotel guests, the Town should also consider implementing a 4-hour time limit for parking.

Figure 2.13: Elizabeth St. east of Memorial Ave.



2.3 Other Improvements

In the course of reviewing transportation projects and priorities, a few simple low-cost improvements were identified to existing transportation facilities that would address operational and safety issues. These should be undertaken as soon as possible independently of the list of transportation priorities. These improvements include:

- *Crosswalks in channelized right turn lanes* on Memorial Avenue northbound at Village Way, and Highway 19A eastbound at Bennett Road. Signs should be added as illustrated in Figure 2.14 and Figure 2.15 to improve the visibility of the crosswalks to approaching motorists.

Figure 2.14: Multiuse crossings signs on Memorial Ave. at Village Way

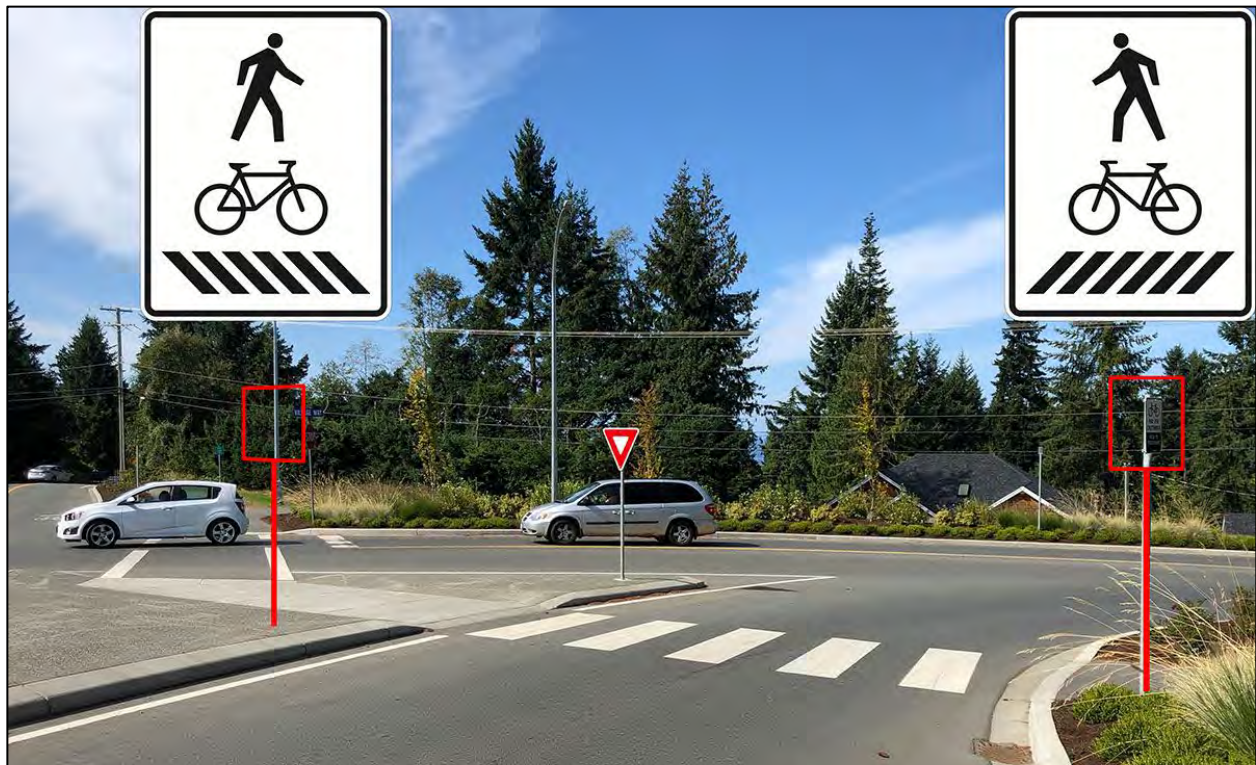


Figure 2.15: Additional school crossing sign on Hwy. 19A at Bennett Rd.



- “School” stencils on Bennett Road at Arrowview Elementary School, to reinforce the 30 km/h school speed zone, as illustrated in Figure 2.16.
- *Student pick-up and drop-off* on the east side of Bennett Road at Arrowview Elementary School. Recent changes to parking and the pick-up/drop-off area on the school site have resulted in an increase in off-site pick-ups and drop-offs on Bennett Road parking is currently prohibited on the west side, but this signage does not explicitly prohibit motorists from stopping to pick-up or drop-off students. A change to “No Stopping” signs would prohibit stopping or parking altogether.

It is unlikely that a change in signage would deter pick-ups and drop-offs entirely. The Town could consider constructing a barrier curb on the east side of Bennett Road to physically prohibit stopping or parking (buses would stop in the traffic lane at the northbound bus stop).

- *The Dollymount Trail*. The existing pairs of bollards on the Dollymount Trail should be replaced with a single bollard as at intersections on the Memorial Trail. This will avoid directing pathway users travelling in the opposite direction into a head-on conflict between the bollards, and will increase the clearance for maintenance equipment.

Figure 2.16: "School" stencil on Bennett Road



3 Priorities

The table on the last page of this document presents the updated priority transportation priorities. New and updated projects are highlighted in green, and active projects are highlighted in blue. The highest-priority projects in 2019 include:

- *Multiuse pathways* for pedestrians and cyclists, including a new project on Village Way between Nootka Road and Highway 19A.
- *Traffic calming* on Village Way at Kwalikum Secondary School. This project remains a high priority on this section of Village Way, but the full project is quite expensive and would likely require funding from other agencies. As a result, the Town should undertake a phased implementation approach, beginning with improvements at crosswalks.
- *Parking prohibitions* on Highway 19A. Prohibiting parking on the shoulder where there is less than 4 m clearance is a high priority to improve safety for pedestrians and cyclists, pending a study by the Town to consider safety improvements for pedestrians and cyclists, and traffic calming measures.
- *Speed display signs* on Bennett Road at Arrowview Elementary School. This new project is a priority due to the safety benefits for a group of vulnerable road users (schoolchildren).
- *Flashing light crossings* in several locations, including on Highway 19A.
- *Roundabouts* on Highway 19A at Village Way/Country Club Drive, and on Village Way at Qualicum Road.
- *A traffic signal* at the Memorial Avenue/First Avenue intersection. The signal is a higher priority in 2019 due to more pedestrians from nearby developments (including the Berwick Qualicum Beach retirement community and the proposed East Village development) and future pathway connections. A signal would also provide a safe crossing that would reduce the number of pedestrians crossing Memorial Avenue at Railway Street. The Town may wish to delay this project, however, if there is the possibility of a change in the status of the rail line that would avoid the additional cost and design complexity associated with railway signals.
- *Traffic circles* on Primrose Street and Beach Road to address safety issues resulting from non-compliance with all-way stops, and to improve safety for cyclists on the planned neighbourhood bikeway on Primrose Street.
- *A road closure* on Railway Street at Memorial Avenue to address the safety issue resulting from obstructed sight lines.

Transportation Priorities

Criteria: 5 = Highest Priority, 1 = Lowest Priority

27 December 2019

Status	Location	Description	Criteria						Total Score	Weighted Score	Notes
			Safety	Use	Vulnerable Users	Network	Contribution	Cost			
			2	1	2	2	1	1			
Active	Memorial Trail, Crescent Rd.–Village Way	Multi-use pathway to waterfront	5	5	5	5	2	4	26	41	Under construction
	Downtown Trail, Beach Rd.–Memorial Ave.	School Connector Route pathway	5	5	5	5	2	3	25	40	Pathway alignment to be determined
	Dollymount Trail, Memorial Ave.–Berwick Rd.	School Connector Route pathway	5	5	5	5	2	3	25	40	Pathway alignment to be determined
	Village Way at Kwailikum Secondary School	Traffic calming – phase 1 crosswalk improvements	4	4	4	5	4	4	25	38	New crosswalk, sidewalk, parallel parking, medians and street trees
	Hwy. 19A, #2919–#3035 and #3245–#3285	Prohibit parking < 4 m width	4	4	3	5	5	4	25	37	Convert angle parking to parallel parking
Active	Memorial Ave.–Hwy. 19A	Roundabout	5	4	3	5	2	4	23	36	Construction anticipated late 2019/early 2020
	Hwy. 19A along waterfront	Safety study	5	4	3	5	3	3	23	36	Safety improvements for pedestrians, cyclists, traffic calming, parking
New	Bennett Rd at Arrowview Elementary School	Speed display sign(s)	3	4	5	4	4	3	23	35	
	Core bicycle network	Bicycle route and wayfinding signs	2	5	3	5	4	4	23	33	
	Village Way at Kwailikum Secondary School	Traffic calming – full project	5	4	4	5	2	2	22	36	New crosswalk, sidewalk, parallel parking, medians and street trees
Active	Harlech Trail, Cedar St.–Beach Rd.	School Connector Route pathway	5	4	4	4	2	3	22	35	To be completed by March 2020
	Jones St. at Fern Rd.	Flashing light crossing	5	3	3	4	4	3	22	34	
	Bennett Rd. at Sunrise Dr.	Flashing light crossing and streetlights	5	4	3	3	4	3	22	33	
	Qualicum Rd. at Fern Rd. E.	Flashing light crossing and streetlight	4	4	3	4	4	3	22	33	Key crossing on Dollymount Trail
Active	Hoylelake Trail, Arbutus St.–Grandon Cr.	School Connector Route pathway	5	4	4	3	2	3	21	33	To be completed by March 2020
	Village Way–Qualicum Rd.	Roundabout	5	4	3	4	2	3	21	33	
	Hwy. 19A–Village Way–Country Club Dr.	Roundabout	5	5	2	5	1	3	21	33	
	Various	Neighbourhood bikeways	2	4	3	5	4	3	21	31	
	Village Way at Berwick Rd.	Flashing light crossing	5	2	3	4	3	3	20	32	
	Memorial Ave.–First Ave.	Traffic signal	4	5	3	5	2	1	20	32	Defer to avoid additional cost/complexity of railway signals?
New	Hwy. 19A at Hall Rd.	Flashing light crossing	5	3	3	3	3	3	20	31	50 km/h limit, sight distances appear to be > 100 m
	Primrose St. and Beach Rd.	Traffic circles (4)	3	3	4	4	3	3	20	31	Primrose St. neighbourhood bikeway
	Rupert Rd. at Arbutus St.	Flashing light crossing	5	3	3	2	4	3	20	30	Extend Rupert pathway to crossing
New	Rodway Trail, Arbutus St.–Hwy. 19A	Trail and stairs, flashing crossing	4	4	2	4	3	3	20	30	Includes new crossing on Hwy. 19A at Shady Rest
	Jones St.–Fern Rd.	Additional streetlights	2	2	4	4	5	3	20	30	
New	Hwy. 19A at Garrett Rd. or Beach Terr.	Flashing light crossing	5	2	3	3	3	3	19	30	50 km/h limit, sight distances appear to be > 100 m
	Berwick Rd.–Railway tracks	Extend Berwick Rd.	2	5	4	5	2	1	19	30	Subject to railway approval and signal requirements
	Bennett Trail, Hwy. 19A–Railway tracks	Pathway/sidewalk	5	3	3	2	3	3	19	29	
New	Village Way Trail, Nootka Rd.–Hwy. 19A	Pathway	3	3	4	3	3	3	19	29	Both sides of road east of crossing at Christian Fellowship school
	Village Way–Qualicum Rd.	Additional streetlight	2	3	3	4	4	3	19	28	New cobra streetlight(s)
	Arbutus St. at Hoylelake Rd.	Flashing light crossing	2	3	3	3	5	3	19	27	
	Railway St. at Memorial Ave.	Full closure	5	3	2	3	2	3	18	28	Traffic redirected to Village Way
	Village Way–Qualicum Rd.	Traffic signal	3	3	3	4	2	3	18	28	Roundabout is higher priority
	Rupert Rd., Primrose St.–Memorial Ave.	Pathway	4	3	3	2	3	3	18	27	
	Laburnum Rd.–Railway tracks	Pathway connection across tracks	3	3	3	3	3	3	18	27	Widened shoulder with barrier or separate pathway crossing
	Berwick Rd. at railway tracks	Accessible crossing	2	4	3	4	3	2	18	27	Subject to railway approval
	Memorial Ave.–Fern Rd.	Advance protected left turn northbound	2	5	2	5	2	2	18	27	Re-evaluate after Memorial–First intersection is signalized
New	Hwy. 19A at Milner Gardens–Juniper Dr.	Pedestrian crossing and pathway	5	2	3	2	2	3	17	27	70 km/h limit, bus stop westbound
	Rupert Rd., Primrose St.–Memorial Ave.	Pathway	4	2	3	2	3	3	17	26	Extension of Primrose St. neighbourhood bikeway to Memorial Ave.
	Laburnum Rd.–Rupert Rd.	Barriers on shoulder	3	2	3	2	4	3	17	25	Concrete barriers where pathway is on shoulder or road
	Jones St., Valdez Ave.–Fern Rd.	Pathway/sidewalk	4	2	3	2	2	3	16	25	West side north of Garden Rd., new crossing at Garden Rd.
New	Elizabeth St. east of Memorial Ave.	Improve shoulders, 4 hr parking time limit	2	3	2	2	4	3	16	22	
	Hwy. 19A–Chartwell Blvd.–Eaglecrest Dr.	Median modifications	2	3	1	2	3	3	14	19	
	Ravensbourne Ln.	Realign roadway	1	3	1	3	3	3	14	19	
	Hwy. 19A–Yambury Rd.	Protected T-intersection	4	1	1	1	2	3	12	18	Priority reduced due to new signal at Drew/Johnston
	Hemsworth Rd., Dogwood Rd.–Chester Rd.	Improved trail	1	2	2	1	2	3	11	15	
Complete	Bennett Rd. at Cardinal Way	Flashing light crossing									
Complete	Hemsworth Rd., Village Way–Chester Rd.	Accessible pathway									
Complete	Memorial Ave.–Fern Rd.	Pedestrian countdown displays									
Complete	Fern Rd. at Quality Foods	Special crosswalk and illuminated signs									
Complete	Village Way at Hemsworth Rd.	Flashing light crossing									
Complete	Hwy. 19A at Bay St.	Flashing light crossing									
Complete	Berwick Rd.–Veterans Way	Median island in crossing									
Complete	Village Way at Qualicum Rd.	Flashing light crossing									
Complete	Memorial Ave. at Garden Rd.	Flashing light crossing with curb extensions									
Complete	Laburnum Rd. at Claymore Rd.	Flashing light crossing									
Complete	Village Way at Hwy. 19A	Adjust geometry of right turn lane									
Complete	Memorial Ave.–Village Way	Realigned intersection									
Complete	Memorial Ave.–Crescent Rd.	Realigned intersection									
Complete	Rupert Rd. at Berwick Rd.	Left turn lane westbound									
Complete	Memorial Trail, Crescent Rd.–Elizabeth Ave.	Pathway									
Complete	Dollymount Trail, Berwick Rd.–Qualicum Rd.	Pathway									
Complete	School Connector, Laburnum Rd.–Grandon Cr.	Pathway									

**Town of Qualicum Beach
M E M O R A N D U M**

TO: Daniel Sailland, CAO

FOR: Regular Meeting February 26, 2020

FROM: John K. Marsh, Director of Finance

SUBJECT: Town of Qualicum Beach Financial Plan (2020 – 2024) Bylaw No. 738, 2019

RECOMMENDATION:

THAT the bylaw entitled “Town of Qualicum Beach Financial Plan (2020-2024) Bylaw No. 738, 2019” be given third reading.

PURPOSE

The purpose of this report is to provide Council with Financial Plan information related to the Financial Plan process and details relating to the information that was provided to Council at the February 13, 2020 Committee of the Whole Meeting. Additional information to address Committee of the Whole recommendations relating to the 2020 Financial Plan is also provided.

BACKGROUND

At the February 13th, 2020 Committee of the Whole Meeting, Council passed the motions noted below. Please note that the motions that directly relate to the Town’s 2020 Financial Plan will be addressed in the comments section of this memorandum. The resolutions relating to a future asset management meeting and future staff reports will not be addressed in this report; however, if asset management and/or related resolutions require a budgeting change for 2020, then Council could amend the Financial Plan Bylaw at a future meeting.

Committee Recommendations Relating to the Town 2020 Financial Plan

1. THAT the Committee of the Whole recommends to Council THAT Council directs staff to provide a report on increasing budget on Public Works and Parks, AND FURTHER THAT the report includes options on increasing personnel or staffing levels.
2. THAT the Committee of the Whole recommends to Council that there be an additional one time 1% taxation increase for accommodating the cost of a feasibility report for the Perfect Storm Group.
3. THAT the Committee of the Whole recommends to Council THAT the bylaw entitled “Town of Qualicum Beach Financial Plan (2020-2024) Bylaw No. 738, 2019” be given third reading.

Committee Recommendations Relating to Future Asset Management Meeting

1. THAT the Committee of the Whole recommends to Council THAT any further commitment to the 10-year financial plan be deferred, AND FURTHER THAT the 10-year financial plan be referred to the Committee of the Whole meeting in which asset management will be discussed.

2. THAT the Committee of the Whole recommends to Council THAT the following notice of motion from the January 14, 2019 be referred to the Committee of the Whole meeting in which asset management will be discussed:
THAT Council directs staff to prepare and present a report on the state of the sidewalks within the Village Neighborhood, including but not limited to:
 - a. Recent remedial work completed,
 - b. Anticipated remedial work for 2019,
 - c. A proposal for actions and estimated costs, which would reduce current and future tripping hazards,
 - d. A proposal for actions, and estimated costs, which would reduce the ongoing maintenance,
 - e. A capital asset management plan for this infrastructure,
 - f. An estimated cost of undergrounding the utilities on Fern Road West between Memorial Avenue (Highway 4) and Primrose Street, and
 - g. The anticipated cost of undergrounding the utilities on Primrose Street between Second Avenue West and Primrose Lane.

3. THAT the Committee of the Whole recommends to Council THAT the following notice of motion from the January 14, 2019 regular Council meeting be deferred to a future Committee of the Whole meeting:
THAT Council directs staff to prepare and present a report regarding the estimated cost of replacing all of the street lights in Town with LED lighting and the anticipated savings once the lighting has been upgraded.

Committee Recommendations Relating to Future Staff Report

1. THAT the Committee of the Whole recommends to Council THAT the following notice of motion from the January 14, 2019 regular Council meeting be referred to staff (when time permits):
THAT Council directs staff to prepare a report regarding the costs associated with one, or multiple, municipal glass recycling drop off locations, AND FURTHER THAT Council directs staff to prepare potential uses for the collected materials.

2. THAT the Committee of the Whole recommends to Council THAT the following notice of motion from the January 14, 2019 regular Council meeting be referred to a future Committee of the Whole meeting for discussion:
THAT Council directs staff to prepare a report regarding the costs, schedules, staff time, and equipment usage, for the current town run chipping program; AND FURTHER THAT, Council directs staff to provide recommendations regarding:
 - a. Fixed year-round drop-off locations;
 - b. Automated green material pickup;
 - c. Scheduled green material bin drop off; and
 - d. Variable pickup schedules via online requests.

COMMENTS

Committee Recommendations Relating to the Town 2020 Financial Plan

1. THAT Council directs staff to provide a report on increasing budget on Public Works and Parks, AND FURTHER THAT the report includes options on increasing personnel or staffing levels.

Staff support this recommendation.

Preliminary information on public works and parks staffing levels associated with servicing Town assets should be provided to Council at the Asset Management Meeting later this year (specific date not yet determined).

Committee discussion on this resolution dealt mainly with beautification maintenance; however, the resolution requires staff to prepare a report on increasing the budget for Public Works and Parks including options to increase personnel or staffing levels. The outside number of employee budgeted for both 2019 and 2020, including seasonal and student workers, is approximately 20 employees for public works and 16 employees for parks. In 2019, public works utilized about 19.25 full-time equivalent positions (FTE) and Parks about 14.75 FTE. The gap resulted from employee leaves and other labour issues.

There are considerable work level increases in park maintenance areas that have been added in the past year within the Parks department area of responsibility. These increases are mainly along Memorial Avenue and the beachfront. Some of the maintenance requirements for these new areas are the responsibility of the construction contractor for one-year and as such the significant maintenance requirements for Town staff will not occur until 2021. The impact of this work level increase needs to be considered when establishing Level of Service documents as part of the Asset Management meeting later this year.

The Asset Management Strategy that was received by Council at the Regular Meeting held on February 5, 2020, includes Section 4- Level of Service (copy attached). This section identifies a number of steps required to complete the level of service process and these have not yet been completed. The above stated Council resolution relates directly to this Level of Service section of the Asset Management Strategy. This is a long term multiple-year process and as such it will take considerable time to determine accurate financial costing information to carry out specific levels of service. For example, staff would like to be able to provide information such as: the cost to maintain a flower bed is \$x.xx per square meter, or it costs \$x.xx per kilometer to salt collector and arterial roads. Staff are prioritizing the areas identified by Council and some of these unit costing aspects will be presented at the Asset Management meeting.

As mentioned earlier, staffing levels for outside crew employees is budgeted in 2020 at basically the same level as 2019. Senior staff are reluctant to recommend increasing staffing without a level of service document and/or business case to demonstrate the need and identify measurable outcomes.

2. THAT the Committee of the Whole recommends to Council that there be an additional one time 1% taxation increase for accommodating the cost of a feasibility report for the Perfect Storm Group.

Staff support this recommendation.

This resolution could have been for any of a number of new initiative items that Council, and past Councils, implement and/or is having to deal with. For example, the previous Council purchased the St. Andrews property for about \$3.5 million. Funding for the capital portion was intended to be through a Land Sale Strategy, copy

attached. There was no funding allocated for maintenance or other costs related to the purchase of the St. Andrews property. The maintenance and other costs has been in the \$100,000 range for both 2019 and 2020 budget. If future Park budgets are not increased to cover these other costs, then it will result in an overall reduction in park services as scope has increased substantially with no material change in budget. Based on this example, there is a direct connection between this resolution and the previously addressed motion on potential staffing increases.

The underlying messaging aspect of this resolution is important: funding needs to be attached when implementing new initiatives. In some ways, this resolution could have stated “new initiatives” and “on-going” rather than one time only increase for Perfect Storm Group. This would then have better demonstrated on going costs associated with new initiatives.

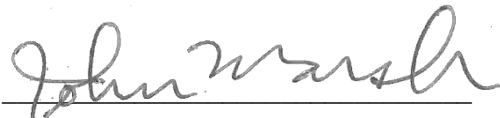
3. THAT the Committee of the Whole recommends to Council THAT the bylaw entitled “Town of Qualicum Beach Financial Plan (2020-2024) Bylaw No. 738, 2019” be given third reading.

Staff support this recommendation.

There are some adjustments to third reading that could be considered in both the operating and capital budget areas; however, the budget bylaw is a summarized document and as such it provides the flexibility for Council to make changes based on new information or opportunities that arise. If significant changes are required at a later date, then they could be addressed through a budget amendment bylaw.

ALTERNATIVES

1. Provide alternate direction to staff



John K. Marsh, CPA, CMA
Report Writer



Daniel Sailland, CAO
Concurrence

4

Capital and Operating Plans

What is the level of service expectation, and what needs to be done?

- a. Level of Service**
- b. Asset Renewal Options**
- c. Strategic Goals**
- d. Legal Obligations and Standards**

Operating Plans - Level of Service

Providing basic municipal services, protecting public safety and the environment are primary considerations in provision of municipal services.

Qualicum Beach residents expect a high level of service from the Town and it is becoming increasingly expensive to maintain services. Consideration should be given to what services are provided, whether they are essential, and how they are provided.

The Level of Service would include the following elements:

- Quantity
- Location of asset or service
- Availability or frequency of service
- Operating Procedures
- Quality of Service

Asset Renewal Options

Asset renewal options need to be considered when reviewing assets and service level documents. This would also involve options for how the service is carried out.

Strategic Goals

Level of service decisions need to be in keeping with and supportive of Council strategic goals. If services are provided that are not consistent with strategic initiatives, then they need to be identified and consideration be given to redeploying the resources.

Legal Obligations and Standards

When considering the Level of Service, other factors such as legal obligations and standards need to be considered. These factors could relate to legislation, regulation, policies, standards and any other requirements that impact on or relate in some way to the assets or the services associated to them.

Next Steps

- Operations to identify activities that require LOS's, create a plan and timeline to complete
- Operations need to consider renewal and service level options compared to standard operating procedures
- Operations to ensure that LOS's align with strategic initiatives and other factors such as legal requirements and standards



July 9, 2018

For Immediate Release

2018-2019 Land Sales and Acquisitions Strategy

News Release

For Immediate Release

Qualicum Beach, BC – Qualicum Beach Town Council has identified over \$5,000,000 in Town-owned real estate assets to be sold over the next two years in order to finance recent land acquisitions. Properties have been identified for disposal only where the community impact is minimal on the local residents. These disposals are part of a strategy to sell less essential lands in order to finance the purchase of valuable strategic lands. This approach allows the Town to isolate land purchases and disposals from Town operations.

Examples of properties that the Town will be selling include two residential lots on Timberlane Place, two lots on Dogwood Road, a house on Chester Road, and a residential development property in west Qualicum Beach. Other properties have been specifically identified but will not be disclosed to protect the Town's financial interests.

"By selling various Town-owned lots, the Town will finance over \$5,000,000 in strategic investments, without impacting our local tax-payers." - Mayor Teunis Westbroek

Quick Facts

- 100% of the proceeds from land sales will be used to finance recent real estate acquisitions.
- Land acquisitions include St. Andrews Lodge (3319 Island Hwy), 2919 Island Highway, 865 Ravensbourne Lane, the Old Bus Garage Site and the Berwick Well field.
- Any Town lands will be sold through a public process, either through a realtor or a private sale that is advertised in the local paper, Town website and Civic Info BC.
- The Town will not be selling any parks, ecologically sensitive areas or community assets.
- The Town will be selling Town-owned lands of lesser community significance to finance major investment and to replenish Town reserve funding that has been used on other recent land acquisitions.

Town of Qualicum Beach, www.qualicumbeach.com

Contacts

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Town of Qualicum Beach
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TOWN OF QUALICUM BEACH
BYLAW NO. 738

The Council of the Town of Qualicum Beach, in open meeting assembled, enacts as follows:

1. Schedule "A" attached hereto, and forming part of this Bylaw, is hereby adopted and is the Financial Plan of the Town of Qualicum Beach for the five-year period from January 1, 2020 to December 31, 2024.
2. Schedule "B" attached hereto, and forming part of this Bylaw, is hereby adopted and is the Statement of Objectives and Policies of the Town of Qualicum Beach for the five-year period from January 1, 2020 to December 31, 2024.
3. This Bylaw may be cited for all purposes as "Town of Qualicum Beach Financial Plan 2020 - 2024 Bylaw No. 738, 2019".

READ A FIRST TIME on the 7th day of October, 2019.

READ A SECOND TIME on the 5th day of February, 2020.

PUBLIC INFORMATION MEETING held the 13th day of February, 2020.

READ A THIRD TIME on the ____ day of _____, 2020.

ADOPTED on the ____ day of _____, 2020.

Brian Wiese, Mayor

Heather Svensen, Corporate Administrator

SCHEDULE "A"
QUALICUM BEACH FINANCIAL PLAN BYLAW NO. 738, 2019
FOR THE FIVE YEAR PERIOD 2020 TO 2024

Revenues	2020	2021	2022	2023	2024
Property Value Taxes					
Municipal Taxation	9,280,000	9,697,000	10,133,000	10,589,000	11,066,000
Grants in Lieu of Taxes	416,000	425,000	434,000	445,000	457,000
Parcel Taxes	895,000	896,000	897,000	899,000	903,000
Fees and Charges	2,750,000	2,973,000	3,071,000	3,173,000	3,285,000
Other Sources					
Own Sources	1,406,000	1,281,000	1,288,000	1,302,000	1,331,000
Government Grants	3,867,000	3,005,000	1,224,000	4,478,000	1,288,000
Total Revenues	18,614,000	18,277,000	17,047,000	20,886,000	18,330,000
Expenditures	2020	2021	2022	2023	2024
Other					
Debt Interest	86,000	95,000	82,000	73,000	62,000
Amortization Expense	3,300,000	3,350,000	3,400,000	3,450,000	3,500,000
Municipal Purposes					
General Government	2,211,000	2,287,000	2,341,000	2,398,000	2,472,000
Protective Services	2,909,000	3,027,000	3,136,000	3,239,000	3,365,000
Transportation Services	2,613,000	2,695,000	2,788,000	2,885,000	2,986,000
Environmental Health	2,180,000	2,388,000	2,471,000	2,558,000	2,647,000
Community Development	1,208,000	955,000	985,000	1,016,000	1,048,000
Parks and Recreation	1,831,000	1,855,000	1,915,000	1,964,000	2,020,000
Total Expenditures	16,338,000	16,652,000	17,118,000	17,583,000	18,100,000
Annual Surplus/Deficit	2,276,000	1,625,000	-71,000	3,303,000	230,000
Other Non Operating Items	2020	2021	2022	2023	2024
Amortization	3,300,000	3,350,000	3,400,000	3,450,000	3,500,000
Capital Expenditures	-10,427,000	-7,205,000	-4,146,000	-5,779,000	-2,747,000
Debt Principal	-463,000	-626,000	-629,000	-920,000	-929,000
Proceeds from Sale of Assets	3,517,000	10,000	10,000	10,000	10,000
Proceeds from Borrowing	875,000	2,000,000	1,500,000	0	0
Transfer from Surplus/Reserves	986,000	910,000	0	0	0
Transfer to Surplus/Reserves	-64,000	-64,000	-64,000	-64,000	-64,000
Total Other Non Operating	-2,276,000	-1,625,000	74,000	-3,303,000	-230,000
Financial Plan Balance	0	0	0	0	0

SCHEDULE "B"

STATEMENT OF OBJECTIVES AND POLICIES FOR BYLAW NO. 738 FOR THE FIVE-YEAR PERIOD 2020 TO 2024

In accordance with Section 165(3.1) of the *Community Charter*, the Town of Qualicum Beach is required to include in the Five-Year Financial Plan, objectives and policies regarding each of the following:

1. The proportion of total revenue that comes from each of the funding sources described in Section 165(7) of the *Community Charter*;
2. The distribution of property taxes among the property classes, and
3. The use of permissive tax exemptions.

FUNDING SOURCES

Table 1 shows the proportion of total revenue proposed to be raised from each funding source in 2020. Property taxes form the greatest proportion of revenue. As a revenue source, property taxation offers a number of advantages; for example, it is simple to administer and it is fairly easy for residents to understand. It offers a stable and reliable source of revenue for services that are difficult or undesirable to fund on a user-pay basis. These include services such as general administration, fire protection, police services, bylaw enforcement and public works.

User fees and charges form the second largest portion of planned revenue. Many services can be measured and charged on a user-pay basis. Services where fees and charges can be easily administered include water and sewer usage, building permits, business licences, and sale of services – these are charged on a user-pay basis. User fees attempt to apportion the value of a service to those who use the service.

Objective

Over the next five years, the Town will continue to review the proportion of revenue that is received from user fees and charges to determine whether the user-fee component could be increased to lessen the requirement for property taxation.

Policies

- The Town will review all user-fee levels to ensure that they are adequately meeting the costs of the service. This will include garbage, recycling, kitchen waste, cemetery, airport, licences and permits, and all other fees and charges.
- Water metering will be reviewed to ensure that appropriate user fees are being collected for water and sewer usage and, perhaps, reduce the reliance on the parcel tax component.
- Where possible, the Town will endeavour to supplement revenues from user fees and charges, rather than taxation, to lessen the burden on a limited property tax base. This will include a comprehensive review of all fees and charges bylaws.

Table 1 Funding Sources

Revenue Source	% of Total Revenue	Dollar Value
Property taxes	45.81%	\$10,591,000
User fees and charges	11.90%	\$2,750,000
Other sources	6.08%	\$1,406,000
Government grants	16.73%	\$3,867,000
Other transfers/revenue	19.48%	\$4,503,000
Total	100%	\$23,117,000

DISTRIBUTION OF PROPERTY TAXES

Table 2 outlines the distribution of property taxes among the property classes for the Town's portion of the property taxes. The residential property class provides the largest proportion of property tax revenue. This is appropriate, as this class also forms the largest portion of the assessment base and consumes the majority of Town services.

The 2020 property taxes are based on a 3.5% increase over the 2019 property taxes plus 1% in new construction taxes. The Town's portion of the property taxes represents approximately 50% of the total tax bill sent to property owners. The other tax levies are not included in the figures below. These other taxes include the Regional District, School, Hospital, Library and BC Assessment, and Municipal Finance Authority. The 2019 Town tax rate is shown, as final 2020 property assessment information has not been received from the BC Assessment Authority. Once assessments are received, tax rates are calculated and this could change the distribution shown on the table below.

Table 2 Property Tax Distribution

Class of Property	2019 Town Property Taxes		2019 Town Tax Rate
Residential	\$8,018,045	90.268%	2.743
Utility	\$44,730	0.504%	37.5000
Commercial/Other	\$792,032	8.917%	6.6381
Managed Forest	\$337	0.004%	1.3715
Recreation/Non-Profit	\$27,096	0.305%	6.6381
Farm	\$182	0.002%	1.3715
Total	\$8,882,422		

Objectives

- Over the next five years, the tax burden between residential and commercial should continue to be reviewed to ensure fairness.
- Maintain the property tax rate for Commercial/Other (Class 6) at a rate competitive with surrounding communities.
- Tax increases should be stable and, where possible, targeted to specific areas.

Policies

- Supplement, where possible, revenues from user fees and charges to help offset the burden on the entire property tax base.
- Continue to maintain and encourage community and appropriate economic development initiatives designed to enhance the community.
- Align the distribution of tax rates among the property classes with the social and community development initiatives established by Council.
- Regularly review and compare the Town's taxes with comparable surrounding communities.

Property Tax Projections

Over the next 10 years, property taxes are projected to increase as shown below. These projections are reviewed annually and are subject to change, based on a number of factors. These factors could include inflation, infrastructure conditions, economic climate, environmental considerations, public input and Council priorities.

- 2020 to 2029 – 3.5% tax increase comprised of 1.5% inflation, 1% for service changes and 1% for capital projects related to asset management program.

PERMISSIVE TAX EXEMPTIONS

The Town of Qualicum Beach annually exempts from property taxes those properties that are non-profit in nature and provide a community benefit, as determined by Council. Places of public worship are also exempted. These properties are annually advertised and then exempted by bylaw.