

REQUEST FOR DECISION REPORT

TO: Committee of the Whole

FROM: Al Radke, Chief Administrative Officer

IN COLLABORATION WITH:

SUBJECT: Connected Communities - The Last Mile

ACTION/RECOMMENDATION

THAT the Committee recommend the Board adopt the Connectivity Last Mile qRD Internet Infrastructure Assessment Report authored by Driftwood Communications Ltd. and dated June 2021.

PURPOSE/SUMMARY

To present the findings of Driftwood Communications and their recommendations.

BACKGROUND

At the regularly scheduled Board meeting of the qathet Regional District held on October 29, 2020; the following motion was rose and reported on by the Board:

THAT the Board commission Driftwood Communications Ltd. to investigate and develop a connectivity plan with strategies to bridge the gap and pave the last mile for unserved and/or underserved communities within the qathet Regional District.

TYPE OF DECISION

Directive Decision

HEALTH & SAFETY IMPACT/RELATIONSHIP

The opportunity for improved connectivity in the qathet qRD will have a drastic impact on being able to improve health and emergency services.

RISK MANAGEMENT IMPACT/RELATIONSHIP

LEGISLATIVE, REGULATORY, BYLAW OR POLICY IMPACT/RELATIONSHIP

The Canadian government now considers high-speed internet a basic service.

DISCUSSION/ANALYSIS

The qRD sought a consultant/company to develop a connectivity plan that would bridge the connectivity gap and pave the last mile within the Regional District. Participation in the digital world is critical for the viability and economic sustainability of all communities. For residents of rural and remote locations especially, high-speed internet gives them the ability to connect with medical advice, educational opportunities, employment, tourism, emergency preparedness and a universe of goods and services. The COVID-19 pandemic has made this ever so much more apparent. Regional connectivity will enable urban amenity access to those seeking a rural lifestyle in the qRD. Some residents of our region do not currently have access to high-speed internet and are at an extreme disadvantage because of this. Reliable, dependable, high-speed connectivity will provide an opportunity to support a sustainable, inclusive community through respectful cooperation, communication, collaboration and engagement, thus allowing the qRD to grow to its fullest potential.

The qRD commissioned Driftwood Communications Ltd.. They have since:

- Determined the present state of affairs
- Assessed each respective Electoral Area
- Inventoried what Internet Service Providers (ISPs) are available within the qRD
- Analyzed current state of broadband networks and explored strategic alliances (dependent on willingness of ISPs to collaborate)
- Summarized ISPs, coverage area, speed and pricing
- Mapped out inventories and connectivity
- Provided a high level estimate of the capital and operational costs
- Assessed possibilities for a broadband service established and provided by the qRD
- Assessed possibilities for broadband services delivered through partnerships
- Assessed possibilities for broadband services delivered via facilitation provided by the qRD i.e. the qRD connects existing ISPs with the Connected Coast project
- Provided recommendations for a short, medium and long term strategy

Attached as Appendix A is the qRD's Regional District Connectivity Last Mile Report dated June 2021.

FINANCIAL IMPACT

The qRD was awarded a grant from Island Coastal Economic Trust for the value of 50% percent of the total project budget, not exceeding the maximum amount of \$22,700.

The Board has approved the allocation of \$30,000 of available funding from the Community Works Fund.

PUBLIC AND/OR STAKEHOLDER ENGAGEMENT REQUIRED OR PERFORMED

Driftwood Communications Ltd. engaged the public during their investigation and research phase.

ATTACHMENTS

[Appendix A qathet Regional District Connectivity Last Mile Report-June 2021](#)

Approved By:

Al Radke, Chief Administrative Officer

Status:

Approved - 24 Jun 2021

qathet:

Working Together

A name gifted to the Regional District by Tla'amin Nation Elders.



qathet
REGIONAL DISTRICT

CONNECTIVITY LAST MILE

qRD

INTERNET INFRASTRUCTURE

ASSESSMENT REPORT

JUNE 2021

Prepared for the qRD by:



DRIFTWOOD COMMUNICATIONS LTD.

6800 VEYANESS ROAD

SAANICHTON, BC

V8M 2A8

www.driftwoodcom.com

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Broadband	In the context of Internet access, broadband is used to mean any high-speed Internet access that is always on and faster than dial-up access over traditional analog or ISDN PSTN services. In telecommunications, broadband is wide bandwidth data transmission which transports multiple signals and traffic types. The medium can be coaxial cable, optical fibre, radio or twisted pair.
Constellation	Large group of satellites
CRTC	Canadian Radio & Telecommunications Commission
Demobilization	Costs to get equipment and work crews back to their business location
Download	Data being received
Fixed Wireless Network	This can be a Wi-Fi network or a Cellular providers product for stationary customers
FOSC	Fibre Optic Splice Closure
FTT*	Fibre to the (Home, Premise or Business) FTTH, FTTP, FTTB
GBIS	Gillies Bay Internet Society
Gbps	Gigabit per second
HFC	Hybrid Fibre Coaxial
IEEE	Institute of Electrical and Electronics Engineers
Infrastructure	Hard assets such a poles, conduits, towers, buildings, and network equipment
IoT	Internet of Things (Automated remote monitoring & control communications for anything)
ISP	Internet Service Provider
LIAS	Lasqueti Island Internet Society
Latency	Latency is the time it takes to send data from one point to the next
LOS	Line of Sight
LTE	Long Term Evolution is a standard for wireless data transmission
Make-Ready	Changes to existing support structures like poles, supporting cables and conduits that must be completed before a new cable or fibre can be placed.
Mbps	Megabits per second
Mobilization	Costs to get equipment and work crews to the construction location
OLT	Optical Line Terminator
ONT	Optical Network Terminal
PON	Passive Optical Network
P2MP	Point to Multi Point
P2P	Point to Point

qRD	qathet Regional District	Page 9 of 93
ROI	Return on Investment	
SSA	Support Structure Agreement	
Support Structure	Pole lines, conduit systems, towers	
Upload	Data being sent	
Wi-Fi	A family of wireless network protocols, based on the IEEE 802.11 standards	

qathet Regional District (qRD) is a local government authority in British Columbia and includes five Electoral Areas (A, B, C, D, E) and one municipality (City of Powell River) with a regional population of approximately 20,000 residents.

The qRD's jurisdiction covers approximately 5,000 square kilometres of land including Texada, Savary, and Lasqueti islands, north to Toba Inlet and south to Saltery Bay. The boundaries of the qRD overlap the traditional territories of the Tla'amin, shíshálh, K'ómoks, Homalko, Klahoose, Wei Wai Kum Kwiakah, and Laich-Kwil-Tach First Nations.

The qRD engaged Driftwood Communications Ltd to develop a connectivity plan that would bridge the connectivity gap and pave the last mile within the Regional District. Participation in the digital world is critical for the viability and economic sustainability of all communities. For residents of rural and remote locations especially, high-speed Internet gives them the ability to connect with medical advice, educational opportunities, employment, tourism, emergency preparedness and a universe of goods and services.

The monumental impact of COVID-19 has made the need for connectivity more apparent than ever. This connectivity will also help to provide access to urban amenities for those seeking a more rural lifestyle in the qRD. Unfortunately, there are residents of the region who currently lack access to high-speed Internet and as such, are placed at an extreme disadvantage because of it.

With the Canadian government now considering high-speed Internet a basic service, there is now greater opportunity for improved connectivity in the qRD. This access will help improve health and emergency services, and will provide an opportunity to support a sustainable, inclusive community through respectful cooperation, communication, collaboration, and engagement, thus allowing the qRD to grow to its fullest potential.

A visit to qRD area was completed on January 26th – January 30th

A general survey of the area was conducted to identify:

- the proposed Connected Coast fibre landing location
- existing utility infrastructures, conditions, and capacities
- existing ISP infrastructure
- potential opportunities

Interviews with qRD board members, senior qRD staff and Tla'amin Nation staff

Interviews with the local Internet Service Providers were undertaken to further understand their existing capabilities and where the gaps exist to achieve the targeted service levels.

A public survey was conducted via online, and we also provided hardcopies which were made available for pick up from various locations within the region.

Observations and information gathered was then analyzed by our staff to determine what potential options could best meet the objectives of providing the desired service levels to the region.

The need for connectivity comes in two main forms, Cellular and Internet Services. Access to these services is an integral part of our daily lives and although one electoral area may have a specific type of need greater than another, all areas have common needs for these services to be available to all community members.

Business – For a business to be as successful as possible in today’s world they require the ability to connect with customers and suppliers through email, websites, online catalogs, live chat tools and social media.

Remote Workers - ability to connect to business computer networks, access and transfer large files, work together with other team members and clients through video conferencing and other collaborative online tools.

Remote work opportunities are increasing rapidly and with the pandemic remote worker demand has exploded. However, as businesses increasingly embrace the concept, we are seeing significant growth in both national & international positions. On-line sites like Indeed, ZipRecruiter and FlexJobs post a very large number of positions

Backend software engineer, cyber security: \$150,000

Call Centre Agents: \$19.45/Hour

Senior product designer: \$125,000 to \$140,000

Remote Bilingual Help Desk Position: \$20.00/Hour

Digital payment project manager: \$115,000 to \$130,000

Visual Effects Artist: \$28.84/Hour

Design practice lead: \$100,000 to \$150,000

Executive Assistant: \$30.00– \$35.00/Hour

Education – Remote education opportunities continue to increase within BC, Canada, and the world. This trend will continue as institutions navigate their way through how to deliver high quality courses to remote students. Emerging technologies like 3D Immersive Virtual Classrooms, where a student at home wearing a headset can virtually sit in a lecture hall or stand beside a table watching an instructor assemble a device while being able to ask questions in real time. Here are just a few examples of the long list of institutions now offering online education options.

British Columbia Institute of Technology	Home School Canada	Harvard
University of British Columbia	Open Learning	University of Oxford
	Julliard	MIT

Housing – development in all electoral areas is increasingly reliant on the Internet and Cellular services that are available. The decisions made by developers, builders and buyers will be impacted directly by poor or lacking connectivity.

Environment – increasing the number of individuals working from home will come with a positive impact on the environment with less vehicles on the road as the pandemic has clearly shown. In addition, the IoT will bring a host of monitoring technologies that will have a further positive impact by removing the need to drive to a location for testing that can now be monitored and controlled remotely.

Social Development – is about improving the wellbeing of every individual in society and being connected is a significant part of that mission. Whether to develop their own skills or contributing to their families and communities in a meaningful way. Having remote video monitoring of your child’s daycare, fall alert protection for a family member or staying connected to family and friends. These are just a few examples of things that connectivity can provide for our well-being.

Emergency Preparedness – is reliant on effective communications and not only in one form. Community members must have as many sources as possible for connectivity to ensure they are fully informed. Websites with emergency plans, advice, and information. Community sirens, Cellular alerts, Internet notifications, Television & Radio emergency alerts.

All the above-mentioned items are necessary for a community’s well-being in today’s world. And as technology continues to develop and play an increasingly larger role in our lives, the need for connectivity will increase even more.

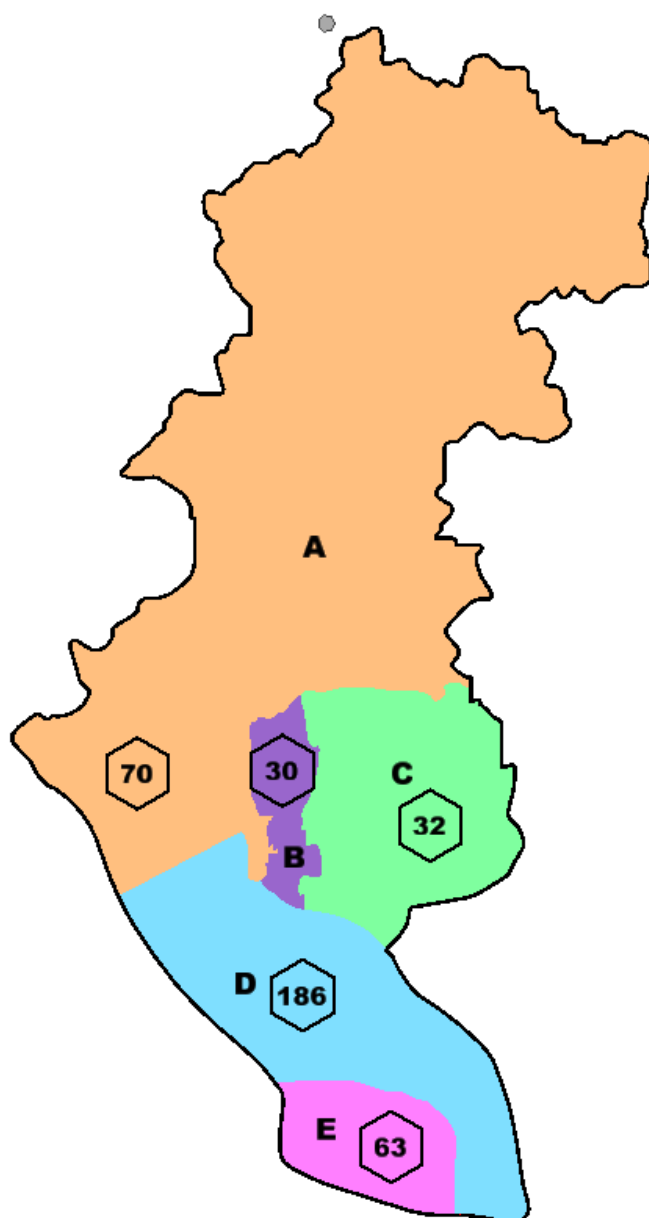
For those community members with limited or no Internet connectivity these things are simply not available in the same way if at all.

Participation in our combination Online and paper survey resulted 341 Online and 53 Paper submissions, for a total of 394 responses from all areas of the community. There is a small variance resulting from surveys that did not complete all questions, so numbers vary slightly for each of the question results. We were unable to reconcile the geographic location of 13 respondents.

Agreement with privacy policy – 100% of participants

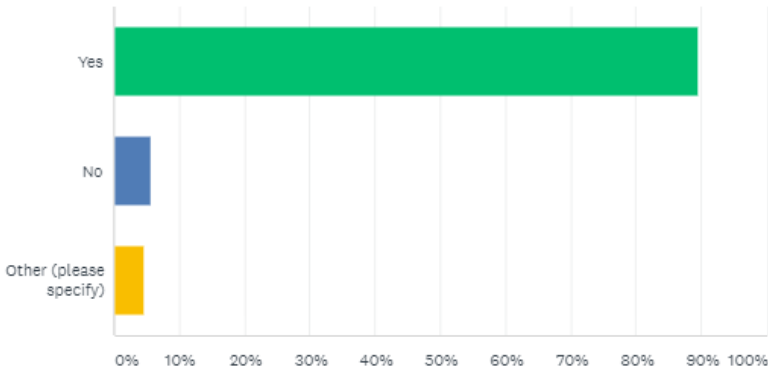
What is your Home or Business location?

Survey Respondents by Electoral Area



Do you currently have internet service available to you and your household/business?

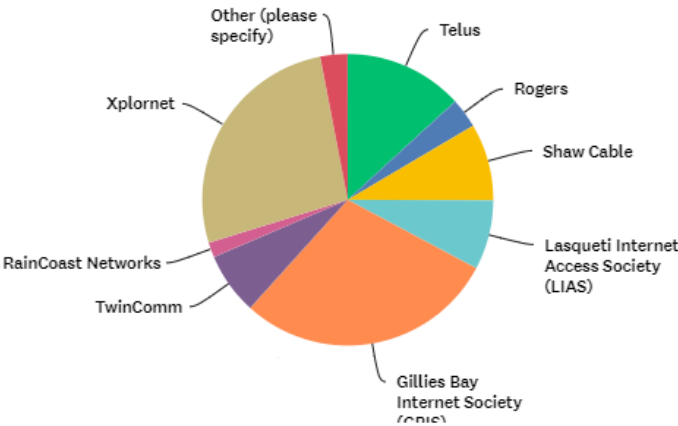
Answered: 385 Skipped: 17



ANSWER CHOICES	RESPONSES	
▼ Yes	89.61%	345
▼ No	5.71%	22
▼ Other (please specify)	Responses 4.68%	18
TOTAL		385

If you answered YES, who is your current Internet Service Provider

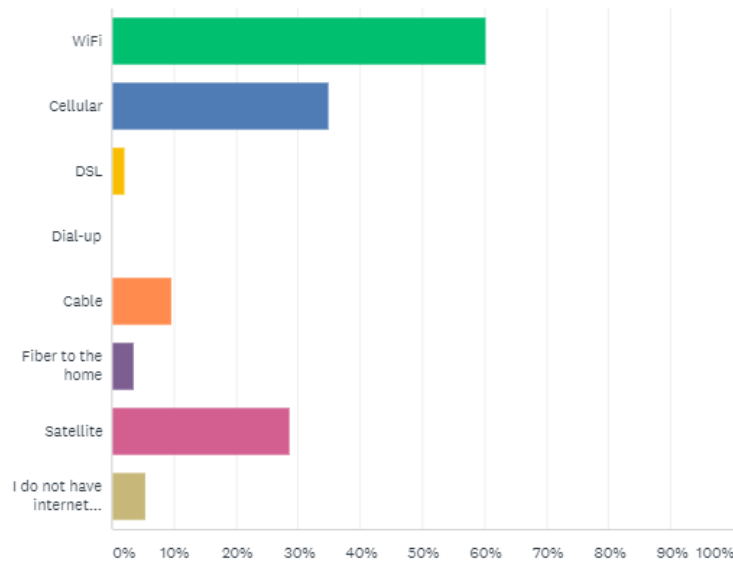
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ANSWER CHOICES	RESPONSES	
▼ Telus	13.22%	48
▼ Rogers	3.31%	12
▼ Shaw Cable	8.54%	31
▼ Lasqueti Internet Access Society (LIAS)	7.71%	28
▼ Gillies Bay Internet Society (GBIS)	28.93%	105
▼ TwinComm	6.89%	25
▼ RainCoast Networks	1.65%	6
▼ Xplornet	26.72%	97
▼ Other (please specify)	Responses 3.03%	11
TOTAL		363

What type of Internet service do you currently use? (Please check all that apply) Page 14 of 93

Answered: 384 Skipped: 18



ANSWER CHOICES	RESPONSES	
WiFi	60.16%	231
Cellular	34.90%	134
DSL	2.08%	8
Dial-up	0.00%	0
Cable	9.64%	37
Fiber to the home	3.65%	14
Satellite	28.65%	110
I do not have internet service	5.47%	21
Total Respondents: 384		

What current upload speed do you have? Here is how you can check your speed: [Test Upload Speed](#)

Answered: 357 Skipped: 45

ANSWER CHOICES	RESPONSES	
Mbps upload	70.31%	251
I do not know	31.37%	112

Category		Download Speed				Upload Speed			
All Respondents		Ranged from 1 TO 330 Mbps				Ranged from 0.1 to 324 Mbps			
Many entries are suspect to be reversed while others had entered values far exceeding the chosen technologies capability. Removal of entries that exceeded the indicated technology and those likely reversed, resulted in the following stats. These number are representative of the respondents only and not the service providers.									
Wi-Fi Users		Satellite Users		HFC Users		FTTH Users		Cellular Users	
Down	Up	Down	Up	Down	Up	Down	Up	Down	Up
16.7 Mbps	11.7 Mbps	10.1 Mbps	1.2 Mbps	95.6 Mbps	41.5 Mbps	105.1 Mbps	69.26 Mbps	16.9 Mbps	5.85 Mbps

How satisfied are you with your current internet service level? (1 star being very dissatisfied and 10 being very satisfied)

Answered: 363 Skipped: 39

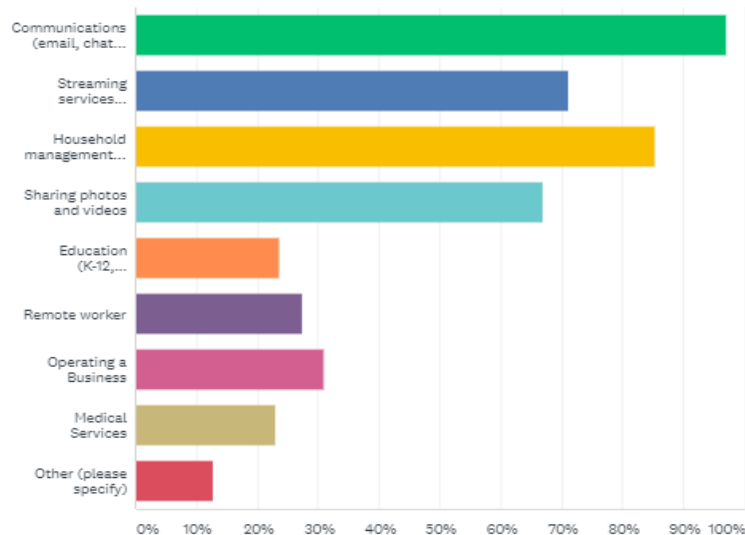
5.1★
average rating



▼	1	2	3	4	5	6	7	8	9	10	TOTAL ▼
▼ ☆	12.67% 46	8.82% 32	12.12% 44	9.64% 35	12.67% 46	9.09% 33	15.15% 55	8.54% 31	4.68% 17	6.61% 24	363

For what purpose do you use your Internet service? (Please check all that apply)

Answered: 384 Skipped: 18

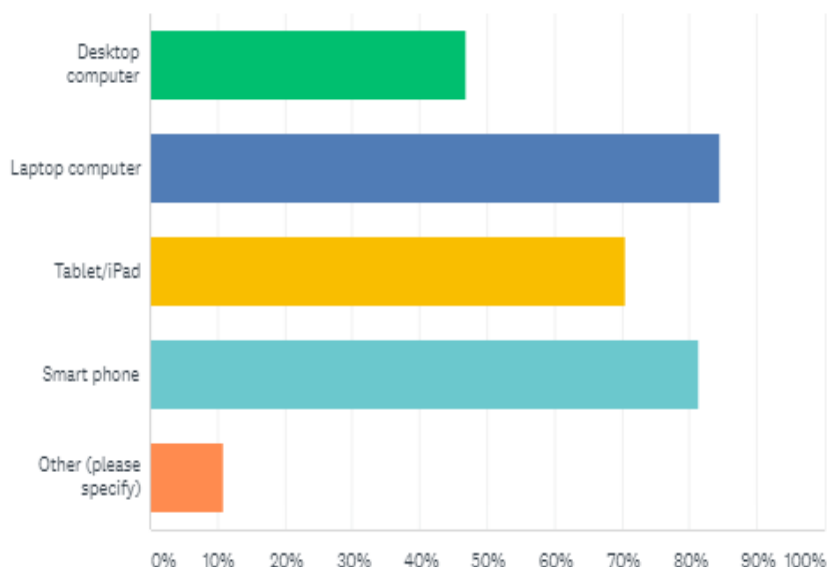


ANSWER CHOICES ▼	RESPONSES ▼	
▼ Communications (email, chat, social media i.e. Facebook etc.)	97.14%	373
▼ Streaming services (music/videos/gaming)	71.09%	273
▼ Household management (Paying bills, booking travel, etc.)	85.42%	328
▼ Sharing photos and videos	66.93%	257
▼ Education (K-12, Post-Secondary)	23.70%	91
▼ Remote worker	27.34%	105
▼ Operating a Business	30.99%	119
▼ Medical Services	22.92%	88
▼ Other (please specify)	Responses 12.76%	49
Total Respondents: 384		

Additional comments included... Family connection, News, research, online shopping, music production, meditation retreats, community digital services.

What devices do you or would you use for your Internet service?(Please check all that apply)

Answered: 387 Skipped: 15



ANSWER CHOICES	RESPONSES	
▼ Desktop computer	46.77%	181
▼ Laptop computer	84.50%	327
▼ Tablet/iPad	70.54%	273
▼ Smart phone	81.40%	315
▼ Other (please specify)	Responses 10.85%	42
Total Respondents: 387		

Other devices included... Gaming consoles, Smart TV's, Apple TV, Roku, IoT devices for security and remote monitoring and management, Point of Sale and ATM's and servers.

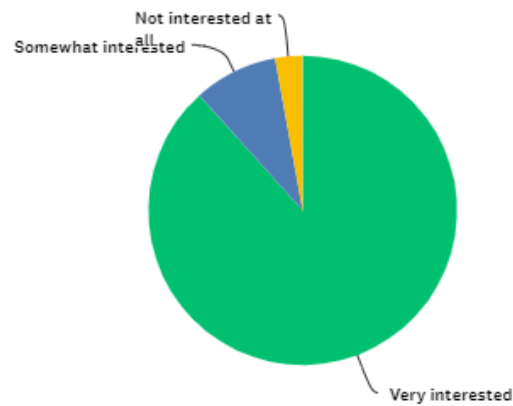
How many people in your household would use internet

Answered: 375 Skipped: 18

Number of Users ranged from 1 to 10 with the average being 2.33 per household.

How interested are you in having high speed Internet service in your home? Page 17 of 93

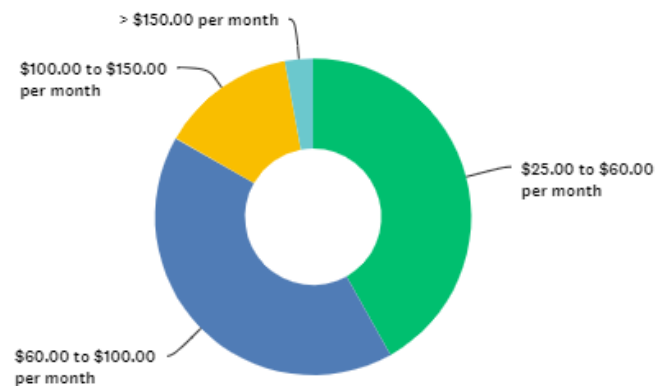
Answered: 386 Skipped: 16



ANSWER CHOICES	RESPONSES
▼ Very interested	88.34% 341
▼ Somewhat interested	8.81% 34
▼ Not interested at all	2.85% 11
TOTAL	386

What monthly fee would you be willing to pay for high-speed Internet service?

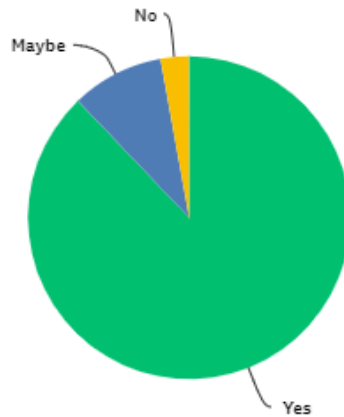
Answered: 382 Skipped: 20



ANSWER CHOICES	RESPONSES
▼ \$25.00 to \$60.00 per month	41.88% 160
▼ \$60.00 to \$100.00 per month	41.36% 158
▼ \$100.00 to \$150.00 per month	13.87% 53
▼ > \$150.00 per month	2.88% 11
TOTAL	382

Do you think rural residents should have access to the same quality of Internet as those in cities, towns and suburbs?

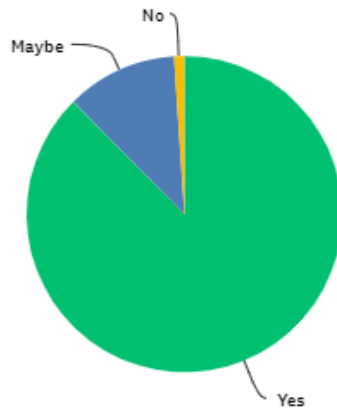
Answered: 388 Skipped: 14



ANSWER CHOICES	RESPONSES
Yes	87.89%
Maybe	9.28%
No	2.84%
TOTAL	388

Do you think the government should play a role in helping to extend high-speed broadband Internet service to the rural areas of Canada?

Answered: 387 Skipped: 15



ANSWER CHOICES	RESPONSES
Yes	87.60%
Maybe	11.37%
No	1.03%
TOTAL	387

INTRODUCTION

The Internet revolution has had a profound impact on humankind; an impact only comparable to a handful of world-changing inventions such as the printing press, steam engine and the home computer. Unlike those three inventions, broadband connectivity is not as easily picked up and moved to specific locations. Expanding broadband connectivity is capital intensive, and the ROI is hard to project when considering the construction of wireline or cellular networks into remote and low-density communities. However, in our rapidly changing world, these initial capital costs will soon pale in comparison to the opportunity cost associated with not having widely accessible broadband connectivity.

Just like the expansion of the Canadian railway in the nineteenth century, broadband Internet can be the catalyst for developing new communities, industries, and the untold opportunities yet to come. Furthermore, given the unprecedented freedoms that a connected world creates, communities within the qRD would theoretically be able to compete in many sectors within traditional global economic hubs such as New York, London, Tokyo, and Silicon Valley. For Regional Districts that aspire to achieve economic and quality of life improvements, broadband access has ceased to be a luxury and has instead become a true necessity.

The qRD and Electoral Areas A, B, C and D have a modest population growth projection of approximately 20% by 2041* driven by in-migration. Key contributing factors to whether these actual population projections are realized or even exceeded will be access to health care, social services and perhaps even more so, by the economic and employment opportunities that develop through the possibilities that an interconnected world provides.

Just like the days of the railroad, when it comes to broadband connectivity, there is some truth to the saying “build it and they will come”.

The following table outlines the population for each region over 5-year increments between 2001-2016.

As one can clearly see, the population growth rate for the qRD is minimal compared to BC over the same time frame and the qRD even experienced population reductions over that time frame for Electoral Areas C and D.

Population Change 2001-2016¹

AREA	2001	2006	2011	2016	Total Change 2001 - 2016	Pop. Change 2001 - 2016	% Change 2001-2016
Area A	988	914	1,008	1,080	92		9.30%
Area B	1,450	1,489	1,488	1,565	115		7.90%
Area C	2,135	2,074	2,014	2,060	-75		-3.50%
Area D	1,129	1,107	1,053	1,076	-54		-4.80%
Area E	367	359	426	399	32		8.70%
Powell River	12,983	12,957	13,165	13,157	174		1.30%
Tla'amin Nation	677	682	730	728	51		7.50%
qathet Regional District	19,765	19,599	19,906	20,070	305		1.50%
BC	3,907,735	4,113,487	4,400,057	4,648,055	740,320		18.90%

POPULATION CHANGE FORECAST 2016-2041

The qRD is forecasted to grow at 18.90% between 2016 and 2041 vs. a population growth forecast of 29.80% increase for BC. This forecast reflects a significant acceleration of population growth when compared to the actual growth experienced in the region between 2001-2016. Furthermore, recent demographic and real estate trends in 2020 are indicating these forecasted numbers may in fact increase due to the ongoing societal and lifestyle impacts of the Covid-19 pandemic. An Oct 2020 ICET report shows that while large urban areas in Canada are benefiting from an influx of international migration, smaller to mid-sized communities are progressively attracting Canadians of prime working ages in the 25-54-year age grouping. This holds especially true on the Island and coastal regions where “employment, amenities and climate”² are key factors in attracting in migration to these communities. As we will explore in further detail below, access to amenities and especially work from home and rural employment opportunities are simply no longer viable without a consistent broadband connection. Whether or not the recent Covid-19 related demographic trends will continue, new flexible and geographically neutral employment opportunities will be limited most by an insufficient labour pool and the absence of leading-edge telecommunications services.

¹ The Arlington Group: *qathet Regional District – Electoral Areas A, B, C and D*. July 2019: Page 18

² Island Coast Economic Trust: *High Quality of Life and Employment Attracting Newcomers* October 15, 2020



AREA	2016	2021	2026	2031	2036	2041	% Change 2016-2041
Area A	1,080	1,130	1,180	1,221	1,267	1,296	20%
Area B	1,565	1,632	1,706	1,768	1,824	1,878	20%
Area C	2,060	2,145	2,237	2,319	2,398	2,466	19.70%
Area D	1,076	1,123	1,170	1,212	1,253	1,283	19.30%
qRD	20,070	20,719	21,583	22,412	23,193	23,879	18.90%
BC	4,757,700	5,039,700	5,343,300	5,645,000	5,923,900	6,178,300	29.80%

Accurate population statistics for Area E are currently unavailable but a 2018 North Region of Islands Trust Housing Needs Assessment Report indicated Lasqueti Islands population was 399 in 2016.³

HOUSING AND AFFORDABILITY

The recent qRD housing report released in April 2021 projects that the combined new housing requirements for Electoral Areas A, B, C and D will be between 273 and 323 by 2030 based on low and aggressive population growth forecasts performed on a Component/Cohort Projection methodological analysis as well as a BC Stats/BC Government study respectively.⁴ While new construction in densely populated areas seldom represents a problem for broadband access, development in the more rural and low-density electoral areas would likely be limited without seamless broadband and Cellular access, potentially stagnating property values and inhibiting improvements to the local economy, safety, and quality of life in general.

Projected residential unit needs per Electoral Area for the period of 2020 to 2030		
	Scenario 1	Scenario 2
Electoral Area A	60	67
Electoral Area B	78	79
Electoral Area C	93	109
Electoral Area D	42	68
Electoral Area E	Unavailable	
Total	273	323

In addition to the forecasted housing demand and supply requirements, the April 2021 report also outlined the troubling trend related to affordability of housing in the area. Affordability in one of the three key indicators for Core Housing Need and those households spending more than 30% of combined pre-tax income on shelter and household expenses are considered in Core Housing Need. Between 2006 and 2016 the number of households spending more than 30% of combined household income increased from 13.3% to 18%⁵ representing a 35% proportional increase in only 10 years. Whether this trend continues or levels off over the coming decade, the reality is that affordable broadband access is going to grow in importance over the coming years to enable education, earning opportunities and improved quality

of life for many of the region's most needy and underprivileged.

³ Dillon Consulting: *Housing Needs Assessment Northern Region of Islands Trust Final*: June 2018: Page 97

⁴ Qathet Regional District: *qathet Regional Housing Needs Report*: April 2021: Page 36

⁵ Qathet Regional District: *qathet Regional Housing Needs Report*: April 2021: Page 34



There are endless economic development opportunities that are associated with connected broadband. Online retail, website development, global commodity sales and stock market trading are just some of the more obvious businesses that, with reliable and robust connections, can literally be based anywhere.

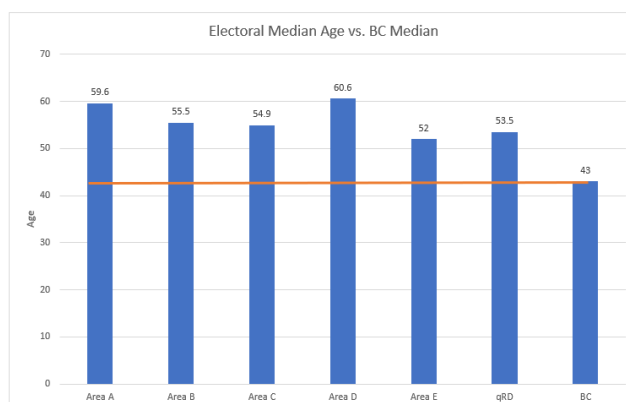
Growing industries such as ecotourism, which thrive on the BC coast and rainforest regions, often require reliable connections to ensure travelers and executives stay connected to the outside world. Key sectors such as aquaculture, forestry and wildlife management are increasingly relying on broadband connections to remotely monitor assets and ensure efficient, sustainable, and real time access to their respective areas of focus. The field of smart technology allows people to remotely connect to appliances and in-home systems via Internet Wi-Fi to manage home temperature, security systems, lighting and promotes environmentally friendly energy consumption. We expect the smart technology industry will continue to provide sustainable business employment for distribution, sales, and installation opportunities across Canada. We also expect smart technology to provide greater appeal for those wanting to purchase a second home or recreation property in the qRD. Recreational urban property sales have reached all-time highs in some areas of BC since the beginning of the COVID-19 pandemic, reflective of the “work from anywhere” world we now live in with broadband. “Increased remote work opportunities have raised demand for homes in suburban areas and in smaller urban centres.”⁶ Furthermore, owners can check in on the status of their wirelessly connected rural home both visually and through their home monitoring technologies creating a truly safe and Green community with greater peace of mind for homeowners.

⁶ Business in Vancouver: *BC Housing Market Sets Sales Record*: January 26, 2021 Bryan Yu.

URL: <https://biv.com/article/2021/01/bc-housing-market-sets-sales-record>



The 2019 population analysis conducted by the Arlington Group, suggests that older members of the workforce and senior citizens will be the two dominant demographic groups over the coming decades. The median ages across the Regional District are significantly higher than the BC average and while it is impossible to predict how median age ranges will evolve in the future due to the high number of variables at play, the 2016 median age report by the Arlington Group clearly exemplifies the higher proportional need for Health Care services and associated amenities in the region when compared to British Columbia overall. Area E population census was last conducted in 2011.



2016 census data was not available for Lasqueti Island Local Trust Area; 2011 data was used instead.⁷

In Healthcare, reliable broadband connectivity is now considered a basic requirement for urban areas to facilitate key day to day functions such as: online medical consultations; appointment/procedure booking; medical result distribution; online addiction video support groups; radiology result distribution and online video counselling. Communities that are unable to support these services (and other critical emerging health needs) will likely have limited growth opportunities, especially in the electoral areas of the qRD which are projected to have above average aging trends over the next +20 years.

To highlight this trend, between 2001-2016, the group between 65 and 84 more than doubled in 3 of the 4 electoral areas. Furthermore, the median age for the qRD is 10.5 years older than the provincial average and Electoral Areas A and D are 16.6 years and 17.6 years over the BC average, respectively.⁸

⁷ The Arlington Group: *qathet Regional District – Electoral Areas A, B, C and D*. July 2019: Page 8

⁸ The Arlington Group: *qathet Regional District – Electoral Areas A, B, C and D*. July 2019: Page 8



The Covid-19 pandemic has caused an unprecedented paradigm shift in education, forcing many educational institutions to adopt a more online-friendly curriculum. While brick and mortar learning institutions will most likely remain in a post COVID-19 world, there will be an ongoing and increasing enrollment expectation for students to have access to reliable broadband.

The “Zoom” classroom environment has become critical, especially in higher learning environments, making the need for pencil or paper almost negligible and it does not appear that this trend will stop any time soon. Submitting assignments and data heavy files online is now the norm for Universities. Connectivity is already enabling efficient mediums for video parent teacher interviews and group presentations especially when it makes sense in more remote areas. It is important to note that between 2001 and 2016 the electoral areas experienced a significant drop in the demographic age groups of 0-19 and 20-44, with Area D reducing by 54.3% in the 0-19 age range and 49.2% in the 20 to 44 age range.⁹

Over this same time frame, the median age of the qRD became a full 10.5 years older than BC indicating that post-secondary education and overall economic opportunity may be driving forces, beyond simple birth and death rates, behind youth and family age migration out of the qRD.

EMERGENCY PREPAREDNESS



The inability to quickly contact emergency services is dangerous both for people as individuals and for industries such as Forestry or Fisheries. It is critical that individuals with life threatening health issues and industries that are inherently dangerous, have fast and reliable access to emergency services.

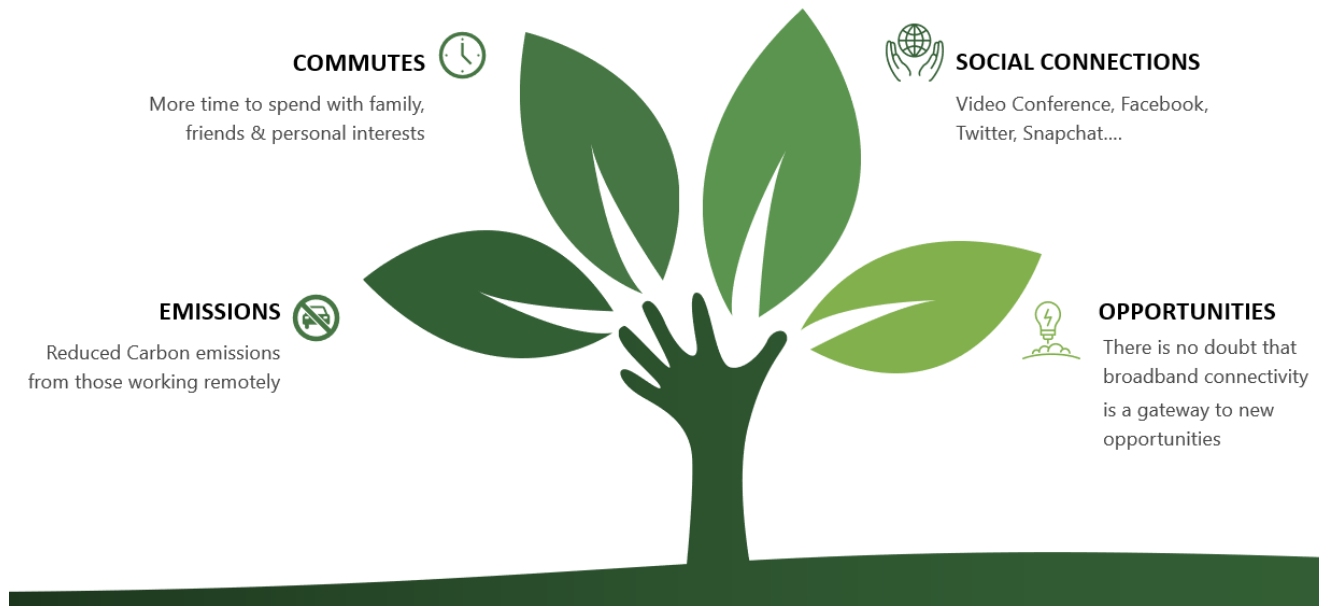
The inability to access mobile phone service greatly inhibits the timely response required in law enforcement; the lack of reliable access to this service creates a collateral health risk in situations involving drunk driving, suspicious activity, or domestic issues, to name a few.

We live in a beautiful part of the world with many outdoor recreationalists who should have strong, reliable phone access in case of emergency; this is a common problem in remote parts of BC including on the inhabited islands in the qRD. In the event of a significant Earthquake and/or Tsunami, residents may be unable to contact emergency services or loved ones, especially if the wireline network infrastructure is compromised. We can mitigate these significant risks by expanding cellular services across the entire region starting with the most densely populated underserved areas first.

THE PANDEMIC EXAMPLE

The pandemic is having a devastating impact on the entire world’s population. And as isolating at home became an increasing requirement, vast number of businesses, institutions and governments sought the ability to enable people to continue to work remotely from home. This led to high demand which then led to shortages of equipment like computers and webcams. And most importantly the realization that adequate Internet service levels to support various levels of work from home were not guaranteed. qRD Directors & staff now need to virtually participate in local meetings, provincial and regional meetings as well as attending or hosting conferences and conventions. For those who have poor Internet services, resulting in lags, freezing screens, loss of sound and dropped connections, the frustration and anxiety ends up being shared by all the participants.

⁹ The Arlington Group: *qathet Regional District – Electoral Areas A, B, C and D*. July 2019: Page 7



Though the merits of working from home vs an office setting are still up for debate in terms of productivity and job satisfaction levels, there is no such debate regarding the environmental merits of working remotely. Reductions in the number of people commuting to work, will result in reduced vehicle emissions.

Carbon emissions and transportation infrastructure requirements/costs decline significantly when less vehicle, ferry, mass transit and air travel are reduced by the move to remote workplaces. Broadband connectivity enables most office jobs to be anywhere on earth as long as employees have access to fast and reliable Internet speeds. Broadband in today's world, and certainly in the future, has profoundly changed the work-life paradigm. Driven by a preference to be closer to nature, have cleaner air and water, a reduced cost of living and less dense neighborhood, many professionals are now able to move from congested, high-cost urban centres to communities with a higher overall quality of life. This prospect may be particularly appealing to those with young families who look favorably on an ecofriendly region to raise children.

Broadband makes this paradigm shift possible for a growing percentage of the workforce and we expect this segment of professionals to grow over the coming decades. The economic, social, and environmental benefits of this trend are very inter-related. Remote communities with broadband availability, access to reasonable emergency/health services and available land for growth have all the key ingredients to build world class prosperous green communities.

Without high-speed Internet, the investment and economic growth that could be fueled by professional and lifestyle immigration to the qRD, could be severely limited.

DEMOGRAPHICS BIBLIOGRAPHY

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The Arlington Group, 2019

Census Dillon Consulting June 2018

The Vancouver Sun

ICET Oct 15, 2020

Our interviews with qRD Directors, Senior Staff and Tla'amin staff were highly insightful and helped us to identify concerns around many of the same socio-economic impacts outlined in the previous Demographics section related to underserved broadband communities. One common theme amongst those interviewed was the increasing sense that areas within the region are perceived as either "have" or "have not" communities. This perception is in relation to broadband access and all the subsequent secondary and tertiary benefits, or lack thereof, resulting from unrestricted broadband access. The language expressed around this issue was relatively strong amongst the interviewees identifying underserved residents as being desperate, and economically hindered from a life-style perspective in addition to feelings of being left out or left behind in relation to locations such as the City of Powell River. The consensus was that there is not a "level playing field" when it comes to underserved communities.

Much of the interview feedback was from a "home-based" perspective around education, business, work/learn from home, Tele-health opportunities and all of the subsequent socio-economic benefits that stem from having unrestricted "home based" flexibility. Feedback shared around such benefits included net positive in-migration for families looking for a less urban lifestyle, to reduced expense and time commitments for seniors who could do a convenient 15-minute video Doctors appointment from home vs. spending an entire day at great expense traveling into Powell River for a 15-minute appointment.

Beyond the extensive home-based opportunities shared in the interviews, concerns were also raised around the burgeoning eco and recreational tourism industries in areas such as Lund and Savary Island being limited in growth potential due to the lack of online booking, social media and guest connectivity access that has become such a staple of the tourism industry. Agriculture and small-scale manufacturing were also identified during the interviews as sectors that will continue to be hindered with the reduced efficiency and communication challenges that come from not being connected to a broadband network.

Significant concerns were also raised about the lack of reliable Internet at some schools particularly those located on the islands as well as the inability of families to homeschool in locations such as Lasqueti Island. Again, there was a sense that underserved schools were simply being left behind.

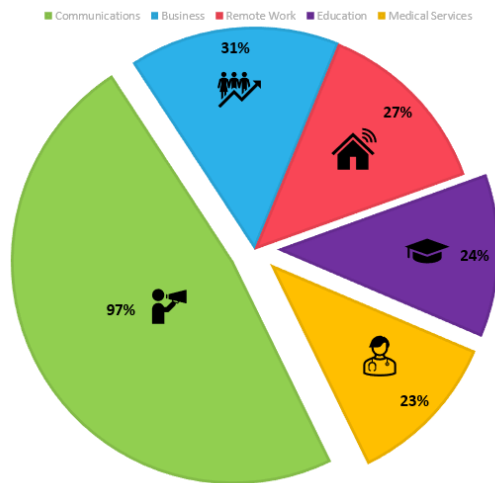
The pandemic brought new challenges in various degrees to Board members and qRD staff as they now work from home and have transitioned to virtual online formats for local and provincial meetings, conferences, and conventions. Those with inadequate service levels are experiencing significant challenges with video and audio cutting out or freezing, or loss of connection, making it very difficult not only for them but for all participants. Without adequate connectivity it is challenging if not impossible to meet the daily responsibilities of their roles.

Rising mental health challenges in the time of Covid-19 lock downs were identified as a major concern. For people without the ability to contact loved ones by video conference or other real-time options, this lack of connection served to underline and emphasize their loneliness and isolation.

Finally, the interviews reflected a common theme around Safety. Due to the lack of 911 access in pockets such as north of Lund or in other remote areas, many people could be left without access to help in the event of an Earthquake and/or Tsunami or a major forest fire. This phenomenon once again speaks to the disparities that exist between the "haves" and "have nots" of the Cellular and Internet footprints in the qRD.

Specific areas identified as most in need by those interviewed were Powell Lake; North of Powell River; Lund; South of Powell River; Savary, Texada and Lasqueti Islands.

All electoral areas within the qRD have common needs for connectivity as illustrated in our survey results.



~97% of respondents use the Internet as a means of communications. Video conferencing, Emails, and Chat are now essential needs.

~31% of respondents operating a business with critical requirements for communications with customers, online live booking systems, cloud services like online accounting.

~27% indicated the need to support their ability for remote working. This need has increased exponentially with COVID 19 and it is widely anticipated that this will continue to be prevalent going forward.

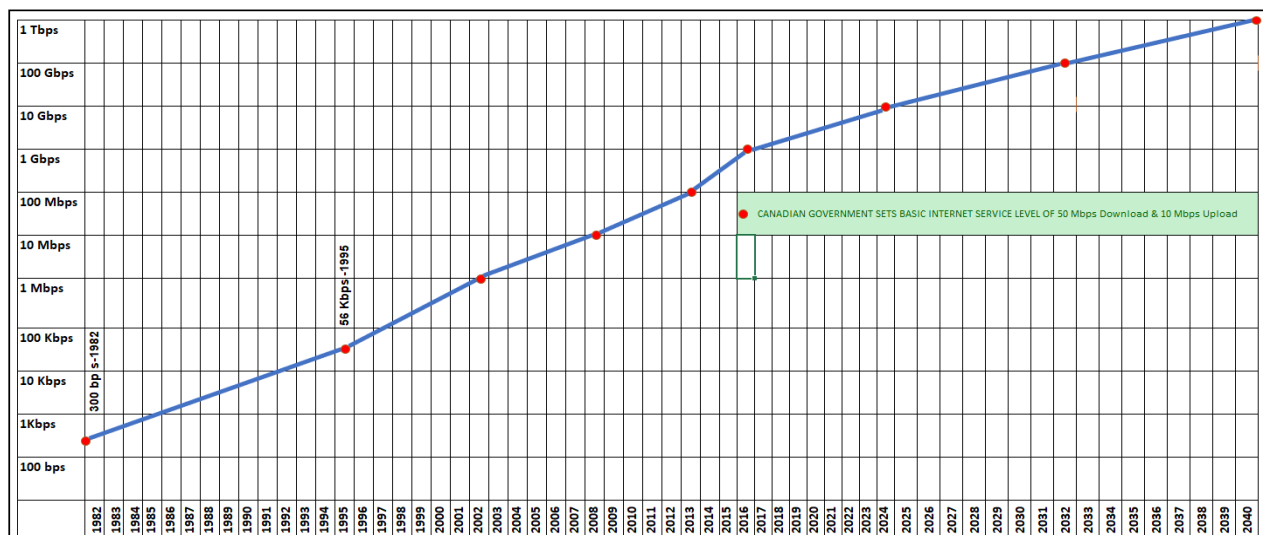
~24% expressed the requirement for Educational purposes. Once again, the pandemic has caused the increased necessity for remote learning for all ages and levels. In most cases this involves video conferencing and the transfer of large files.

~23% stated they use the Internet for Medical Services. The pandemic has shown that being isolated requires remote support via video conferencing with medical professionals. IoT is a fast-growing technology with an increasing number of applications and technologies. The live real-time remote monitoring of a patient's medical conditions with remote sensors connected to the Internet being just such one application.

These examples show the significant and broad use of the Internet today. And by doing so they also show what those without Internet service or adequate service levels are missing. As we look ahead, more things will transition and emerge through the Internet. And only those with an adequate Internet service connection will be able to participate.

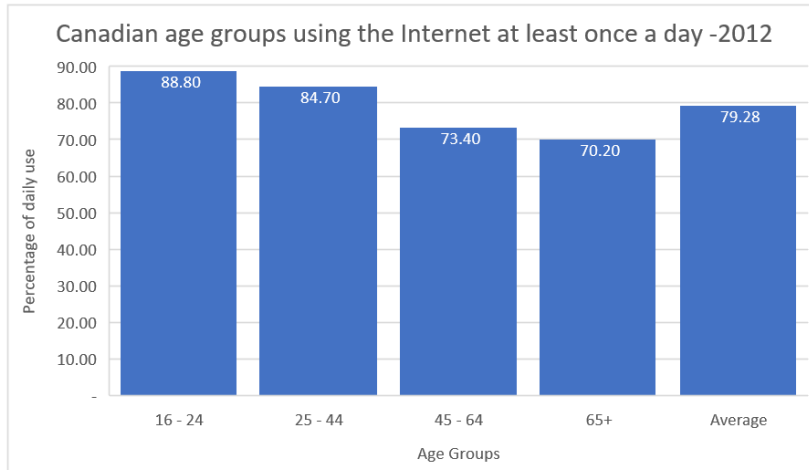
Currently the focus is on those who do not have access to Internet services or service levels below 50 Mbps Down / 10 Mbps Up. And the near future resolution of this looks very positive indeed. However, the continued growth of the Internet as illustrated by Nielsen's law of Internet bandwidth will increasingly grow the gap between Internet users with very high-speed connections verses those with lower speeds. And with this, we can expect once again, to be faced with a society of haves and have nots.

Internet download speed increases past, present and future.



Just as the Internet is now viewed as a basic need, all electoral areas within the qRD have digital aspirations common. Page 28 of 93

Whether it is the ability for individuals to work at home, run a business, maintaining communications, remote learning or any one of the many things that rely on the Internet today.

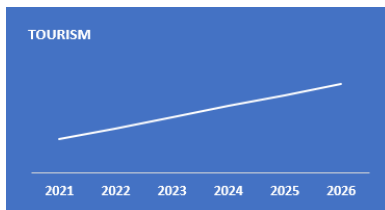


Our Internet research indicated that ~70% of overall Internet usage today is conducted by those between the ages of 16 – 44.

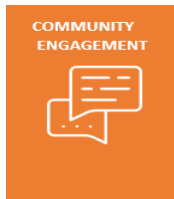
In 2019 the reported median age in the qRD was 53.5 (*See Demographics*).

The most recent stats Canada report to the left supports a higher usage by the younger 16 – 44 age group.

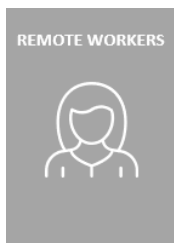
Stats Canada is currently conducting a new survey of Internet usage in Canada that has yet to be released.



The ability to reach the market by creating and maintaining a web presence, communicating with customers via online booking systems, platforms like Facebook, Twitter, LinkedIn, and others. Whether you are a Bed & Breakfast, Fishing Guide or any other of the region's many tourist-based businesses, they cannot fully succeed without an adequate Internet service being available. The hospitality industry is about giving the customer what they want, and today's customers want good Internet service that enables them to share photos, shop or video chat with family and friends each day.



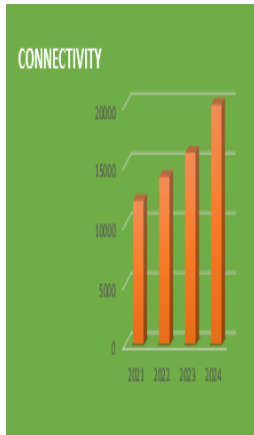
Community engagement is increasingly taking place online with local governments listing services and important information on their websites. From opening online community forums for members to submit surveys, finding lists of tourism activities and accommodations, to scoping out regional event calendars. Having these forums available online is great, but if the whole community does not have adequate access, then community engagement suffers.



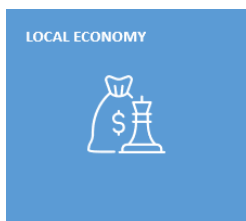
The pandemic has made it necessary for large numbers of the workforce to work remotely from home. What many companies are discovering is how viable of an option this is on an ongoing basis. And an increasing number of companies are embracing a workforce model that includes some or all work being done by employees remotely.

There are a vast number of jobs that can be done from home and as a result, we are seeing an increase in the number of people seeking out these opportunities. How can one resist the attraction of no commute, no car, no gas, and home from work in a split second? There is much conversation happening on this subject, and part of the discussion is about remote workers that traditionally lived in Cities could now migrate to more rural communities where the cost of living and perhaps the lifestyle is more attractive for many.

Communities that focus energy on boosting and boasting their area for these workers will most likely see positive population growth.

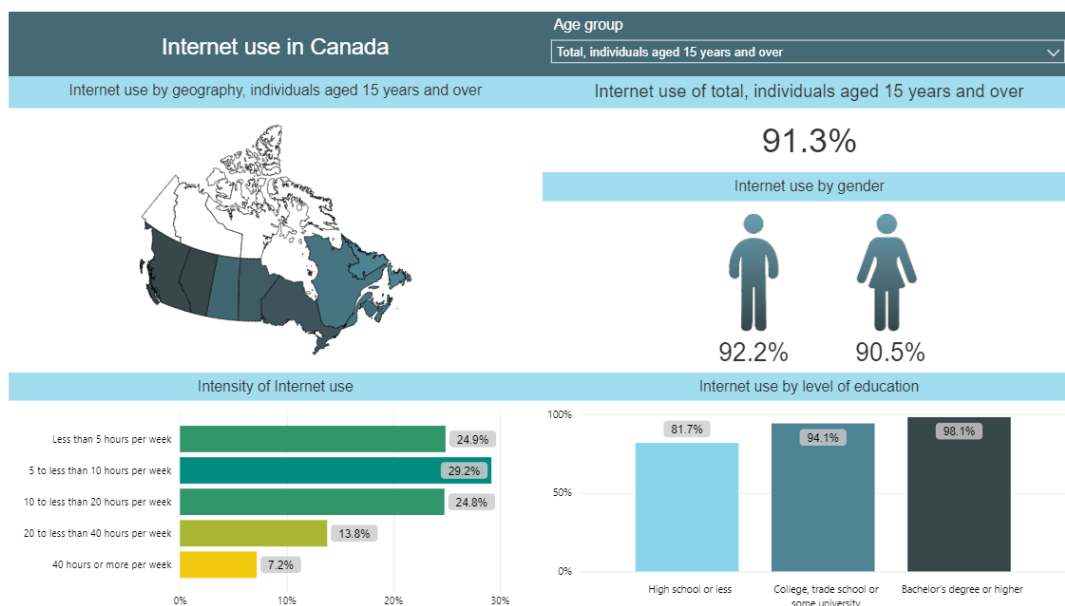


- Remote workers are here to stay
- Businesses will increasingly move to online services and connections with customers
 - Food and grocery businesses will not just stop pick-up, take-out, and delivery
- Educational opportunities will continue to expand content and courses online availability
 - MIT, Harvard and others are already starting to shift to distant learning options
- Medical services continue to expand with new remote technologies
 - Remote sensors for patients transmitting results or warnings to your Doctor
 - Remote controlled robotic surgery facilities, a heart specialist surgeon located in Toronto performing remote heart surgery on a patient in Powell River Hospital
 - Family doctors performing an ultrasound on a patient with a specialist viewing the test in real-time
- Communities will continue to grow their connection through more online services
- Families & friends will increasingly share their connections online



Internet service levels in any community has a direct impact on the local economy and this will only increase in importance. Those smaller communities who have access to highspeed Internet throughout their community will become more desirable locations in which to live and raise a family.

The importance of cellular service was highlighted during a recent outage Rogers Communications experienced this April that resulted in a significant negative impact customer connectivity. The outage certainly highlighted how much we depend on our cellular phones and Internet service in our daily lives.




 2009

There were 9 service providers in the Electoral Area A. Shaw's network extended north from Powell River to Sturt Road offering the highest Internet speeds at the time. North of Sturt Road access was available via Xplornet and the 3 cellular providers. Twincomm provided Wi-Fi services to Lund, most of Savary Island as well as properties located on Hernando Island and Bliss Landing. But TELUS and Bell introduced a new 3G HSPA+ Internet service in late 2009 which was an improvement but comes with high data overage fees.¹⁰

Around **2011** Shaw Cable introduced a Nitro service that further increased the gap in service levels available to densely populated areas verses rural areas.

In **2015/16** TELUS installs their PureFibre (FTTH) network offering 150/150 service in the higher population areas.

2018 RainCoast Networks actively start connecting customers to their Wi-Fi service bringing another Wi-Fi service to rural Area A

In the summer of **2020** Rogers upgraded their tower at Sarah Point improving services.


 2021

There have been some positive improvements for some of those areas originally identified in 2009 as poor or lacking service. In part through the expansion and improvements of both Twincomm and Raincoast Networks.

Twincomm is installing a new LTE network serving the Lund & Savary Island areas that will offer service levels equal to or above the 50/10.

Area A still has remaining areas with limited or no Internet access that were identified in 2009. Most notable is the Lund and surrounding areas north of Sturt Rd including the Okeover Arm. Remote areas such as Powell Lake, Bliss Landing and Selina Point.

¹⁰ Internet Access in the Powell River Regional District – 2009 Report Prepared by Joseph McLean, Second Flux Information Services

2009

- The 2009 commissioned report highlights Area B as the best serviced electoral area of all. Like Powell River the area is well serviced by Shaw and TELUS.¹¹

Around **2011** Shaw Cable introduced a Nitro service that further increased service levels available to those residents in the northern area.

In **2015/16** TELUS installs their PureFibre (FTTH) network offering 150/150 service. Providing a competitive service, but only in the northern more populated region of Area B.

2021

- We were unable to discover any other notable improvements to the already well serviced region.

However, it is important to note that there are certainly small pockets within Area B that currently do not have access to adequate Internet. The lack of access in these areas could be attributed to the fact that it is not uncommon for service to be bypassed if an area is not populated with residents or there aren't enough residents on one street to support a service extension. In some cases, it could be because a new rural road was constructed afterwards.

AREA C

2009

- Service begins strong in the north with services available from Shaw, but as you head south the available service options decline. Residents in the southern portion must rely on services such as cellular and Xplornet. Unlike Area A there are no alternate Wi-Fi providers at this time.²

Around **2012** Shaw extends their network south of Eagle River Rd south to Roberts Road area.

Raincoast Networks launches Wi-Fi services Saltery Bay that is serviced by a Nelson Island tower as well as an access point in Saltery Bay. We were unable to confirm the exact year this occurred.

2021

- Today the vast majority of Area C along highway 101 now has Shaw highspeed Internet services available.

TELUS is presently working to improve Cellular services in the area along Hwy 101 to Saltery Bay with the support of the qRD. And as a result, TELUS' Smart Hub Internet service will also become available in more areas.

¹¹ Internet Access in the Powell River Regional District – 2009 Report Prepared by Joseph McLean, Second Flux Information Services

2009

Texada Island benefits from the services of Twincomm and the Gillies Bay Internet Society (G.B.I.S) with both services being regarded as superior to Cellular and satellite. GBIS has 50 customers. Cellular coverage was reliable in most areas. GBIS is building a new tower site on Mt. Pocahontas.¹²

In **2011** GBIS Mt. Pocahontas tower is partially constructed as they await further grant funding to complete the project. In addition, plans include one additional tower near the Oasis neighborhood and one in Upper Gillies Bay.

Around **2012** G.B.I.S completes construction and activation of the 3 new sites. Improving and expanding their network. In **2013** G.B.I.S now has 120 customers

2021

G.B.I.S now services ~225 customers. They have purchased and installed DOCSIS 3.0 equipment and modems and are currently running a few test modems over the existing cable television system with promising results.

GBIS has applied for grant funding from the Northern Development Initiative Trust for the purpose of rebuilding the existing cable system so that it is operationally capable of delivering a complete DOCSIS 3.0 service to all 290 homes passed by the existing cable system by October 31st, 2021 with the ability to deliver a 50/10 service level.

In the future with an Internet connection from the Connected Coast project, they will be capable of offering service levels exceeding 100 Mbps down and 20 Mbps up.

AREA E

2009

The Lasqueti Island Internet Society (LIAS) network provides services that are available to 80% of the Island residents with ~100 subscribers. Internet service is also transmitted to the GBIS. Gaps still exist south near Squitty Bay as well as the mid-island interior area. A positive success thanks to the hard work of the LIAS and the support of grants.

2021

Lasqueti Island presents some challenges with no conventional source of electricity and no aerial pole structures. This may present challenges for future options. Although, the present Wi-Fi network is being successfully operated using alternate power sources.

Continued improvements to LIAS Wi-Fi network with Tower & Antenna upgrades will offer some improvements going forward and the completion of the Connected Coast fibre landing at False Bay would provide greater bandwidth to the network. To construct any type of FTTH or Coaxial network would involve building a pole line or trenching and entirely new conduit system along roadsides and into properties. A hybrid solution could be another option by trenching fibre along roads to key tower locations around the Island.

¹² Internet Access in the Powell River Regional District – 2009 Report Prepared by Joseph McLean, Second Flux Information Services

2016

- **2016** Xplornet launches new satellite and begins offering 10 Mbps service a significant improvement for rural residents.

In **2016** the C.R.T.C. declared broadband Internet service a basic telecommunications service. At that time, the commission estimated 18% or two million Canadian households do not have access to Internet services meeting at least 50Mbps down / 10 Mbps up. The C.R.T.C.'s set a goal to reduce that to 10 per cent by 2021 and down to zero in the next 10 to 15 years.

This goal has and continues to be supported by several grant funds established by various levels of government as outlined in this report.

2021

- As of **2021** the C.R.T.C. site indicates that 87.4% of Canada has access to 50/10 Mbps services which leaves 12.6% remaining.

Broadband coverage information is collected by I.S.E.D. through ongoing consultation with ISPs, the C.R.T.C., industry associations, provinces and territories, and other partners and stakeholders.¹³

An interactive map is accessible at <https://www.ic.gc.ca/app/sitt/bbmap/hm.html?lang=eng>

To date many communities across Canada, have and are benefiting from this monumental change of how we as Canadian's view access to Internet. For the future of our country's economy and the benefit of every Canadian, it is imperative that we provide access to (at least) the minimum level of affordable Internet service, regardless of their geographical location.

Even though many areas within the qRD have good to superior Internet services, there are still gaps.

More densely populated areas have seen substantial improvements to service levels with TELUS and Shaw now offering Gigabit speeds. These improvements have resulted in a further widening of the gap between service levels available in higher population areas verses more rural areas.

It is important to note that there are most likely residents that are on the edge of existing well serviced areas, that still do not have access to services. These would be roads that were not provided service due to limited density at the time when the adjacent area was constructed. And perhaps still to this day, where the costs to construct may be too high to support a viable business case.

The most identifiable areas within the qRD that currently have limited, or no Internet services are.....

Saltery Bay	Savary Island	West Okeover Arm
Lund & surrounding area	Bliss Landing	Fringe or isolated locations
Texada Island	Lasqueti Island	

In addition to these areas, we are certain there are others who may be on the fringe of existing serviced areas or in remote areas of the region that are also in need of Internet service or improved services.

¹³ <https://crtc.gc.ca/eng/Internet/Internet.htm>

The qathet Regional District has a significant number of Internet Service Providers within the region. With a mixture of both large, medium, and smaller entities. Providing a variety of service offerings for Television, Cellular and Internet services. However, even with as many providers as there are; there still exist gaps in the level of service available to some areas of the region. It is these gaps that we are seeking to identify and present options to create or improve Internet services.

Fortunately, with so many active providers and newer emerging technologies the future looks very positive for those who are currently without service or have the desire to increase their service levels.

The following service providers were identified in the qRD.

Gillies Bay Internet Society	Telesat
Lasqueti Internet Access Society	TELUS
Raincoast Communications	Texada Community Television Association
Rogers Communications	Twincomm
Shaw Communications	Xplornet
Starlink	

The information included in the following provider summaries is strictly for the purpose of presenting general information about each provider's approximate service area and Internet service offerings. This information was gathered from various sources such as the provider's website, and interviews conducted with representatives of the provider.

Anyone wishing to know current factual information, should contact the provider directly.



Internet Service offerings and Rates

For service there are five plans available. All rates include taxes, and overage of \$1/GiB applies to all plans. You can upgrade at any time. All rates include GST and PST. Plans can be combined, so a Medium and an Ultra combine to 290Gb/month.

PLAN	DATA LIMIT Gb	1 Month	3 Month	6 Month	Annual
Standard	60		\$95	\$180	\$350
Medium	90	\$46	\$135	\$260	\$500
High	150	\$75	\$220	\$420	\$820
Ultra	200	\$105	\$300	\$575	\$1,100
Gamer	400	\$200	\$575	\$1,100	\$2,150

Download	20 Mbps
Upload	8 Mbps

The GBIS is actively engaged in solutions to upgrade the existing 1950's coaxial cable system to be capable of providing Internet services and have submitted an application for grant funding. A commendable and green approach to repurposing existing infrastructure. They are enthusiastic about the opportunities that the Connected Coast will offer to increase the speeds to all customers both wireless and those to be provided service over the coaxial cable system.

LASQUETI INTERNET ACCESS SOCIETY (LIAS) - [HTTPS://LASQUETI.CA/SERVICES/LIAS](https://lasqueti.ca/services/lias)

The LIAS is a Non-profit organization run by volunteers.

Lasqueti Island is unique in that there is no traditional BCHydro electrical service on the Island with residents using power they harvest themselves through various methods such as solar, wind and water.

The Wi-Fi network is powered mainly through Solar power with additional backup batteries that require some additional charging during the darker months of the year.

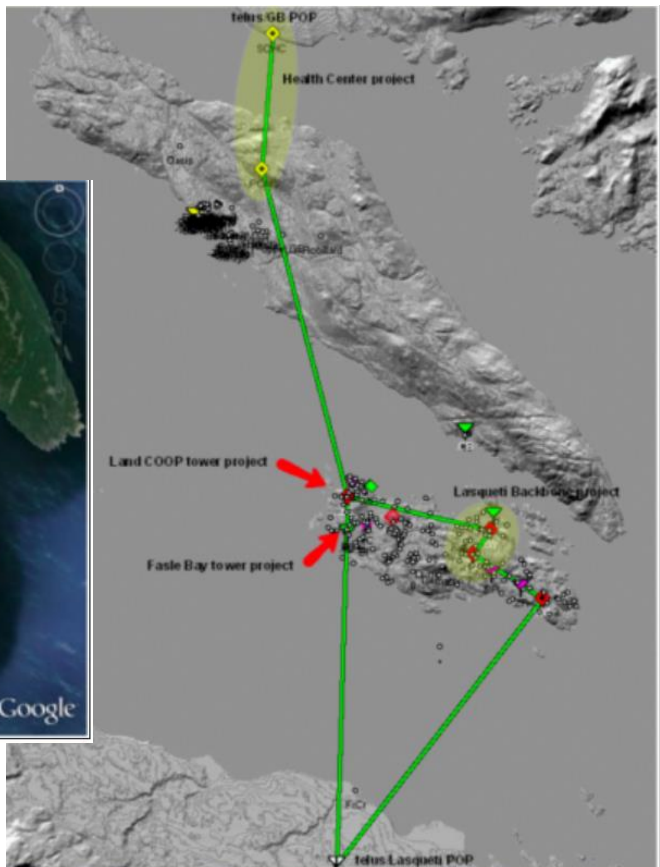
Internet service is available to 60 – 65% of the Island

Internet connectivity is received through TELUS with a 300 Mb Network BC connection via a radio link from Parksville to two towers on Lasqueti Island.

PLAN	DATA LIMIT Gb	Annual
Hotspot	1 hour/day	Free
Annual Lite	250 Gb/Yr.	\$525
Annual Standard	750 Gb/Yr.	\$725
Annual High	1500 Gb/Yr.	\$1,025
Additional Data	100 Gb	\$100

Download	5 to 15 Mbps
Upload	2 Mbps

The network is comprised of 8 linked access point locations. Some network equipment is currently being upgraded and plans are being considered for some sites to be upgraded from pole or tree to a tower.



Members are looking forward to the new opportunities for service improvements that the Connected Coast project can offer.



OneWeb is a constellation of Low Earth Orbit satellites designed to provide wireless Internet access to users, especially in rural areas. The constellation design consists of 650 satellites that will deliver low latency, high speed coverage reaching 95% of the Earth's surface.

They are speeding up their launches with a target to have all satellites operational by 2022. A successful launch of 36 new satellite was completed on March 25, 2021 bringing their total to 146 satellites now in orbit.

OneWeb says they will be more focused on enterprise grade services for business, government, maritime and aviation customers.

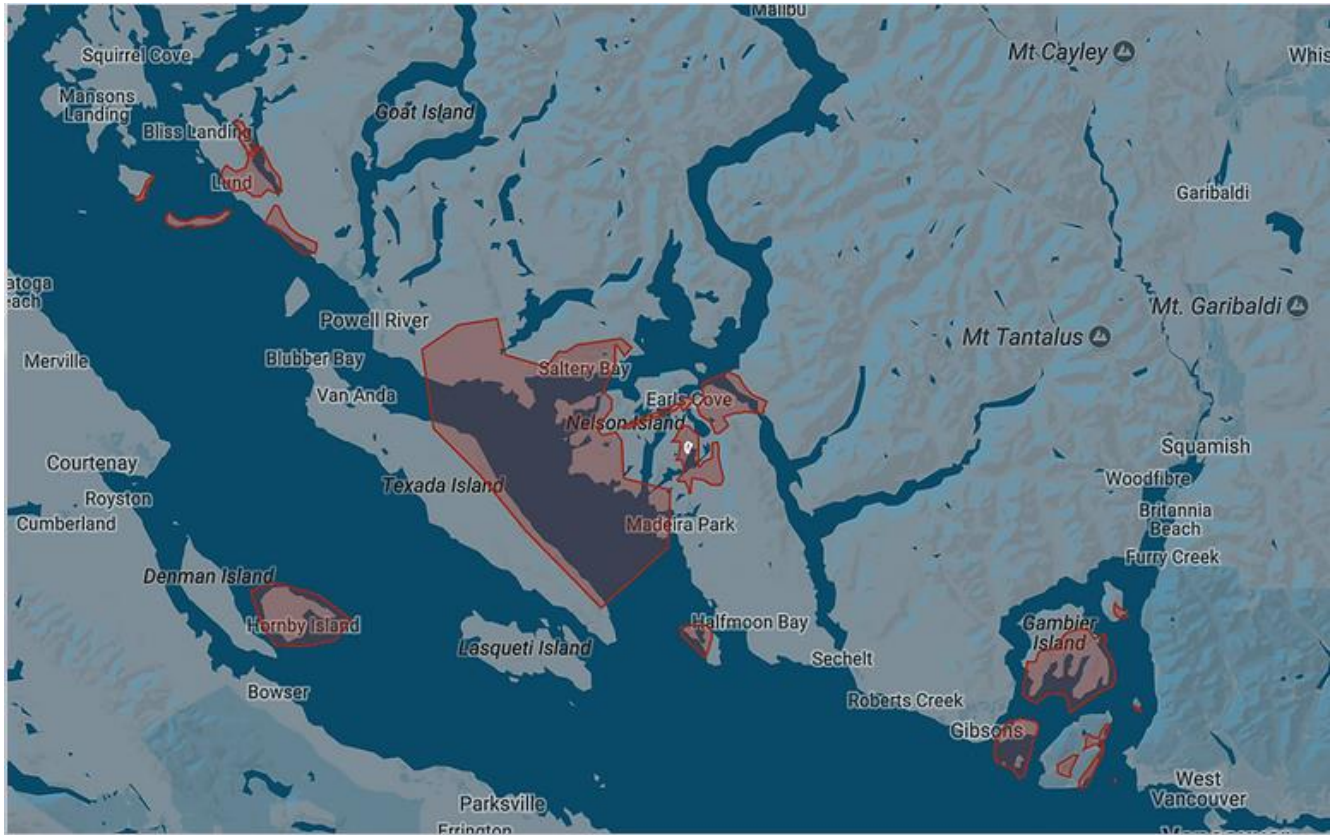
They anticipate offering a commercial service this fall to northern latitudes, which includes Canada.

No service levels or pricing is available at this time.

April 22, 2021

PRESS RELEASE

OneWeb makes ready for the third of five launches in its 'Five to 50' programme to deliver connectivity to regions north of 50 degrees latitude by June 2021.



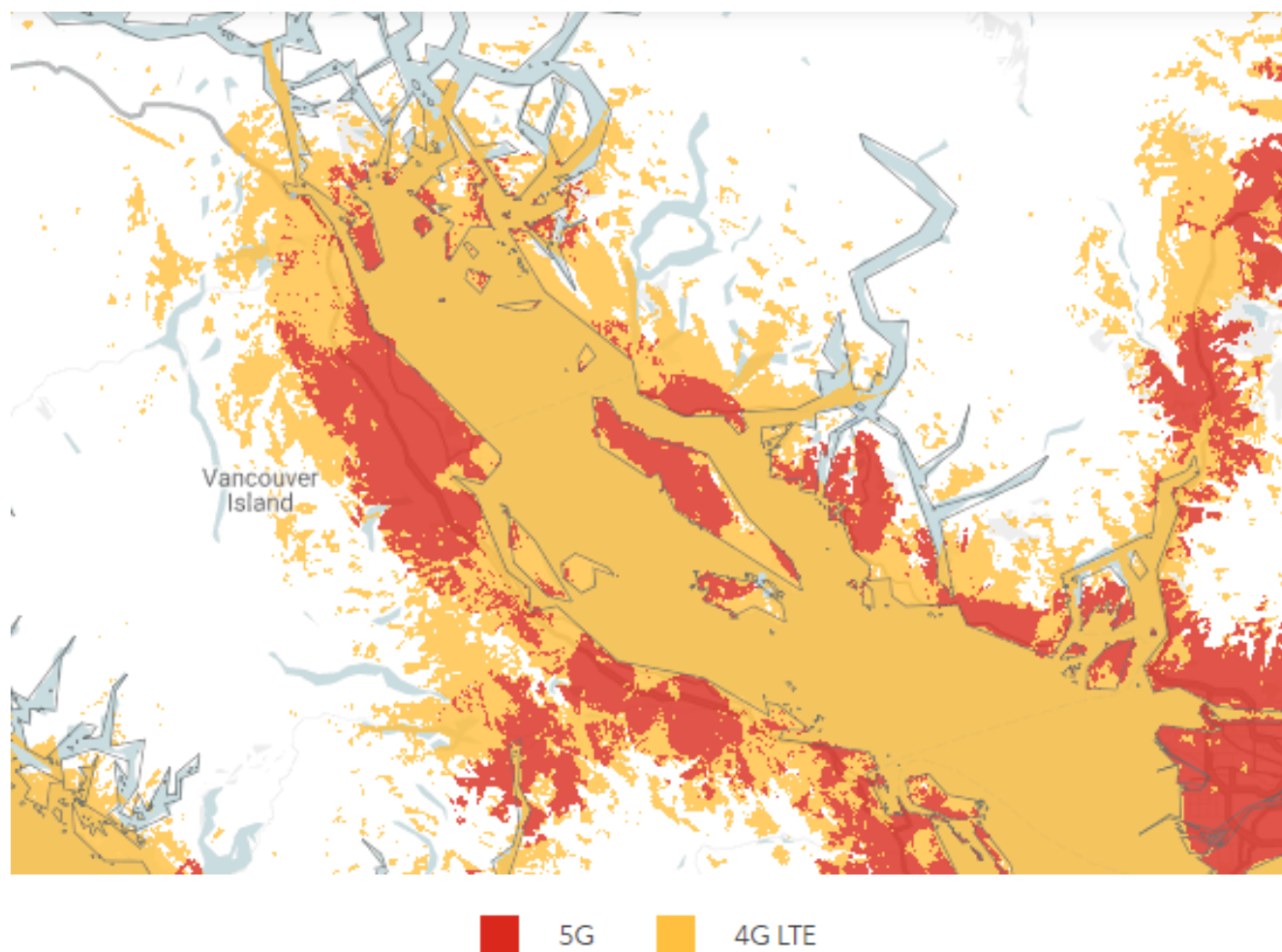
Map not fully updated at time of this report.

Raincoast Networks is a local company based on Savary Island and provides Internet services to several areas both inside and adjacent to the qRD through a network of 42 access points.

Internet backbone delivery is provided by TELUS fibre connections. Back hauls are redundant, dual polarity, standby generators/ or solar, back up run time – varies on location

Current active and planned expansions include areas south of Powell River

PLAN	Download	Upload	Monthly Fee
Base Plan	5 Mbps	2 Mbps	\$55.00
Middle Plan	25 Mbps	5 Mbps	\$90.00
Full Unlimited Plan	35 Mbps	10 Mbps	\$120.00

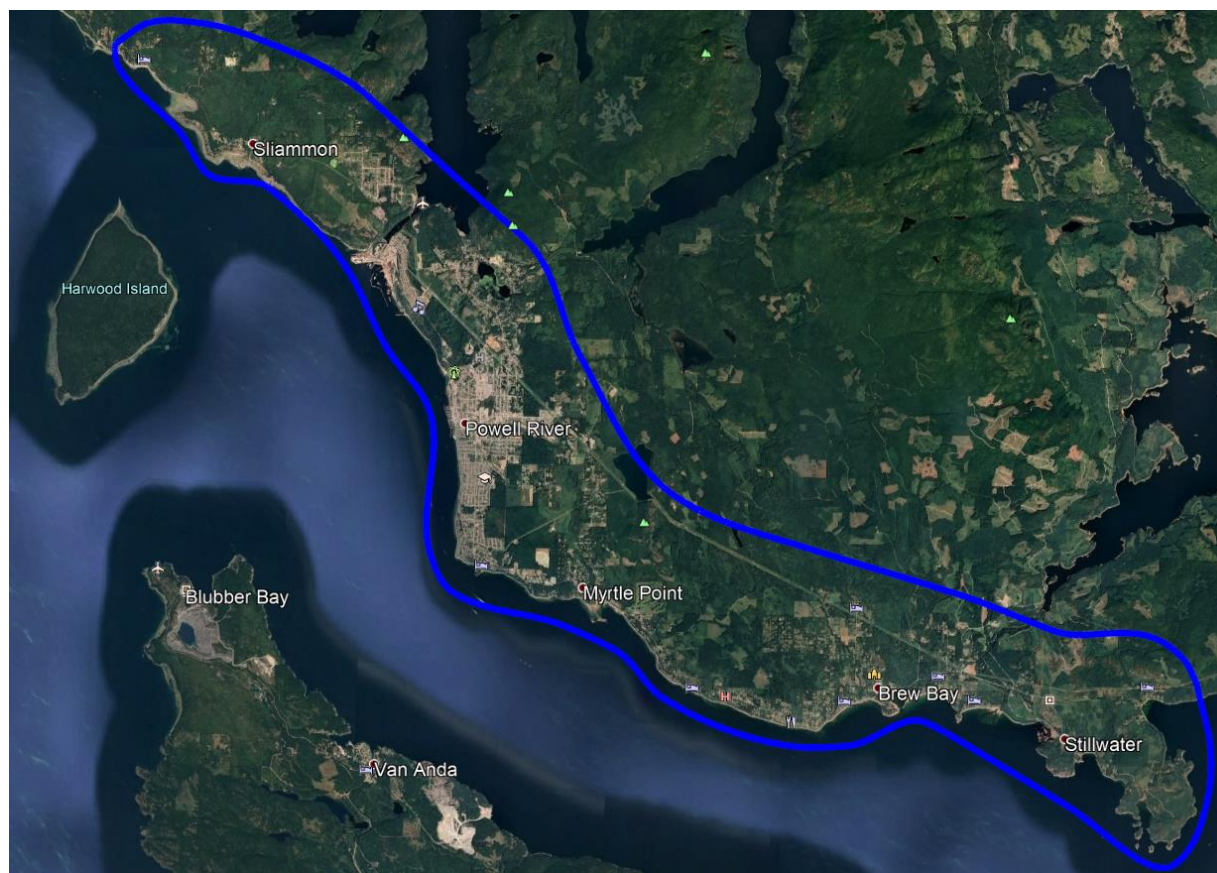


Rogers cellular coverage areas of both active 4G LTE and 5G services are available over a significant area of the qRD.

Rogers has wireless services available that provide cellular/voice and data coverage in addition to providing fixed wireless broadband Internet through their Rocket Hub service.

In 2020 Rogers completed an upgrade project at their Sarah Point tower location.

PLAN	Download	Upload	Monthly Fee
100 Mb	25 Mbps	5 Mbps	\$10.00
5 Gb	25 Mbps	5 Mbps	\$60.00
50 Gb	25 Mbps	5 Mbps	\$120.00

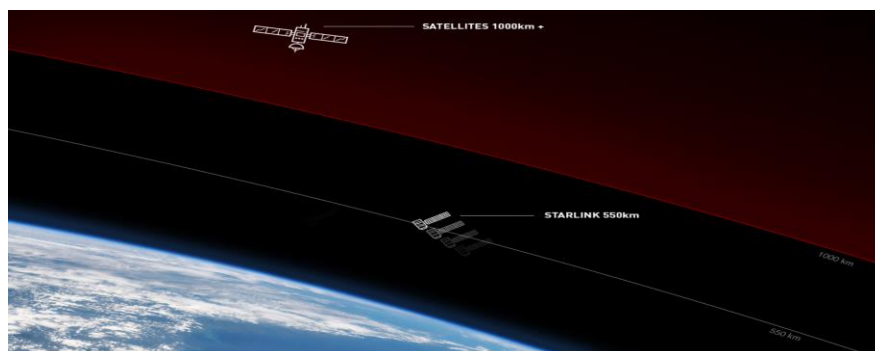


Shaw Communications provides a large variety of services for all types of customers including residential, business and government...

Pricing advertised at the time of this report were as below with options for additional reductions with contracts.

PLAN	Download	Upload	Data Limit	Monthly Fee
Fibre +25	25 Mbps	N/A	250 GB	\$90.00
Fibre +75	75 Mbps	N/A	500 GB	\$95.00
Fibre +150	150 Mbps	N/A	Unlimited	\$105.00
Fibre +300	300 Mbps	N/A	Unlimited	\$110.00
Fibre +750	750 Mbps	N/A	Unlimited	\$120.00
Fibre+ GIG	1000 Mbps	N/A	Unlimited	\$125.00
Fibre+ GIG 1.5	1500 Mbps	N/A	Unlimited	\$175.00

STARLINK - [HTTPS://WWW.STARLINK.COM/](https://www.starlink.com/)



SpaceX's Starlink is a constellation of low-orbit satellites designed to provide wireless Internet access to users, especially in rural areas. The Starlink beta launched in Canada just last November, and is receiving stellar reviews from participants. Starlink states that they are currently launching ~60 new satellites each month and are partially operational. Starlink has applied to the Canadian Federal Government for a license to offer their services to Canadians. Interestingly Starlink's first series of satellites are cruising over Canada and service has been made available to Canadians on a limited beta trial basis.

In January 2021 SpaceX launched 140 satellites in one rocket mission setting a new world record. Ten of these were for the STARLINK network. A recent public filing stated they are now providing service to over 10,000 users.

PLAN	Download	Upload	Monthly Fee
Beta Test	100 Mbps	20 Mbps	\$99.00 US

Starlink is now delivering initial beta service both domestically and internationally and will continue expansion to near global coverage of the populated world in 2021. During beta, users can expect to see data speeds vary from 50Mb/s to 150Mb/s and latency from 20ms to 40ms in most locations over the next several months as we enhance the Starlink system. There will also be brief periods of no connectivity at all. As we launch more satellites, install more ground stations and improve our networking software, data speed, latency and uptime will improve dramatically. Your Starlink Kit arrives with everything you need to get online including your Starlink, Wi-Fi router, power supply, cables and mounting tripod. Starlink requires a clear view of the sky to connect. Download the Starlink App to determine your best install location.¹⁴

We had the opportunity to speak with a new Starlink Beta testing customer just south of Lund who had no other satisfactory service level available at their location.

Why did you choose Starlink?	"No other option available"
What was it like signing up?	"Super Easy, sign up, pay and it was delivered"
Was it easy to Install & get running?	"Yes, very easy"
Did they mention that the service is not licensed in Canada Yet?	"May have been in the fine print, don't know"
What is your service like?	"Download 100 to 300 Mbps"
	"Upload 30 to 40 Mbps"
	"Latency average 20 milliseconds"
Do you feel you're getting value for the cost?	"Yes"
Would you recommend this service to others?	"Already have"

It is very important to note that Starlink is not yet licensed to deliver Internet services in Canada and is currently providing service to paying beta testers. If Starlink were not to receive a license to sell services in Canada Beta testers would likely lose service and their equipment purchase costs.

¹⁴ Starlink.com – March 23, 2021

TELESAT - [HTTPS://WWW.TELESAT.COM/LEO-SATELLITES/](https://www.telesat.com/leo-satellites/)

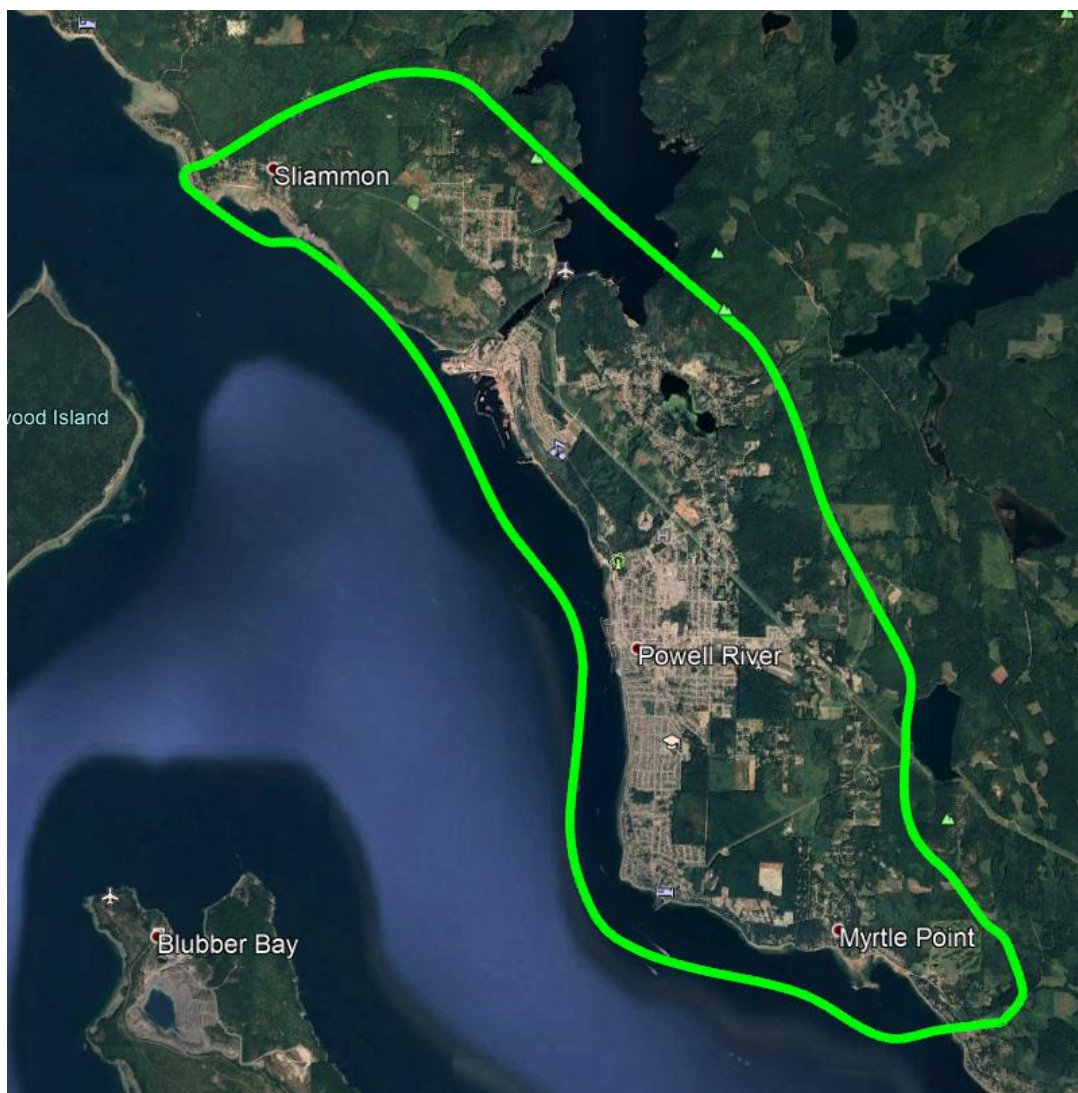
TELESAT has developed a highly innovative global network composed of 298 state-of-the-art Low Earth Orbit (LEO) satellites, seamlessly integrated with on-ground data networks. Our understanding is that TELESAT will be providing Internet service connections to remote ISP's who will then supply service to a community rather than individuals connecting to the service directly. Another very promising option for remote and rural communities. TELESAT launched their first LEO satellite in January of 2018. We did not find any news regarding when their service would become available.

We have included TELESAT in this report as they may be a connection source for a community-based connection.

TEXADA COMMUNITY TELEVISION ASSOCIATION - [HTTPS://VANANDATV.WEEBLY.COM/](https://vanandatv.weebly.com/)

The Texada Community Television Association has an existing coaxial cable system in Van Anda. Internet is supplied via the cable system using Twincomm services.





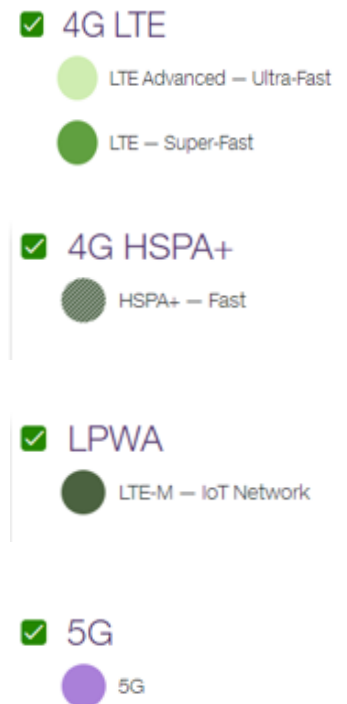
TELUS FTTP (Fibre to the Premise) service area.

TELUS' fibre service is close to symmetrical service delivered over a Passive Optical Network.

PLAN	Download	Upload	Data Limit	Monthly Fee
PureFibre Internet 150/150	150 Mbps	150 Mbps	1 Tb	\$105.00
PureFibre Gigabit Internet	940 Mbps	940 Mbps	1 Tb	\$160.00
PureFibre 1.5 Gigabit Internet	1500 Mbps	940 Mbps	1 Tb	\$165.00

Additional discounts were available as part of a term contract.

TELUS has extensive wireline and wireless services throughout the qRD and continues to maintain and invest in upgrades and expansion of these services as was evidenced from their 2015-2016 fibre to the home project completed in Powell River.



Currently TELUS is focused on improving the wireless network in the qathet Regional District.

Having identified that Cellular service availability is not adequate for the needs of the community from Lund to Saltery Bay along Hwy 101. There are 4 proposed new tower locations required with one location in Lund proceeding to construction as a result of the direct support of the qathet Regional District. These 4 locations will provide much improved cellular coverage along the Highway 101 (Sunshine Coast Highway) corridor, surrounding areas and waterways.

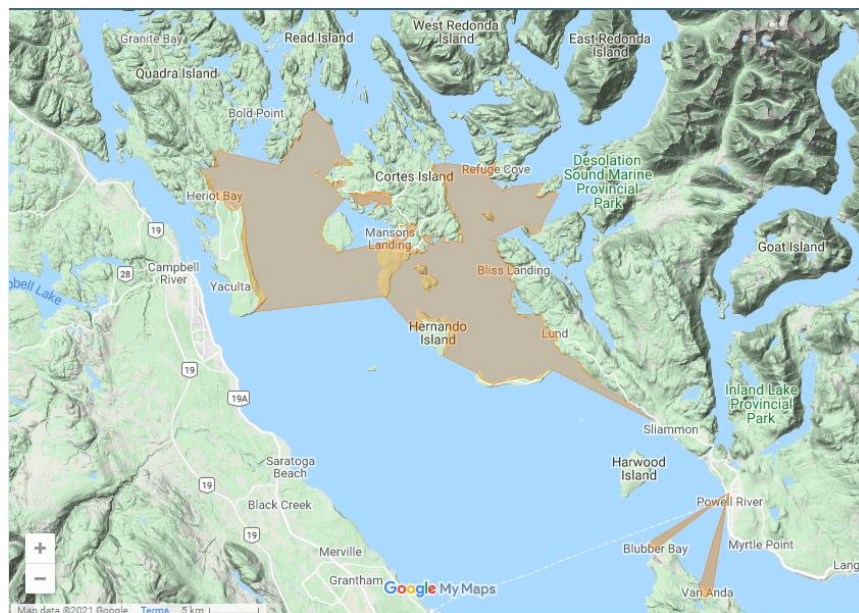
In addition to TELUS' Cellular phone and Internet services the Internet Smart Hub service is also supported through this initiative and will result in the offering a new Internet connectivity option to residents along this route. Although Smart Hub technology presently does not meet the Canadian Governments 50 Mbps download and 10 Mbps Upload speed objectives; it does represent a new additional service offering to local residents.

As with all technologies we can expect to see continued improvements in speeds both up and down in the future as new technology becomes available and TELUS continues to make network investments. Another potential area for increased speeds for this service would be if the Federal Government were to make more spectrum available for use allowing increased capacity and subsequent speeds. In addition to the preceding initiatives TELUS is also focused on the build out and launch of 5G services which will offer increased cellular Internet service speeds and will provide improvements for the Smart Hub service.

PLAN	Download	Upload	Data Limit	Monthly
Smart Hub	25 Mbps	N/A	100 Gb/mo.	\$65.00
Smart Hub	25 Mbps	N/A	500 Gb/mo.	\$80.00
Smart Hub	25 Mbps	N/A	1 Tb/mo.	\$115.00

TWINCOMM - [HTTPS://TWINCOMM.CA/](https://twincomm.ca/)

Twincomm has an extensive wireless network connecting Vancouver Island to the mainland of BC. The network spans multiple islands including Cortes Island, Quadra Island, Hernando Island, Savary Island, Texada Island, West Redonda Island, and the mainland in Bliss Landing, Galley Bay, and Lund BC. Twincomm also provides wired cable Internet on Texada through a partnership with the Texada Community TV Association. Started in 2001 Twincomm has grown from 20 customers to over 800 today.



TwinComm is currently focused on increasing service levels to all existing service areas and customers with no expansion plans at this time. There are plans to increase service levels in January once a larger back haul connection is completed.

A recently constructed LTE system for Lund & Savary Island that will exceed the 50/10 service level to be available for approximately 200 existing customers. The Connected Coast project will provide the ability to greatly improve service levels to equal or above the 50/10 service level by providing the much-needed bandwidth for distribution to customers.

TwinComm's goal is to provide the best possible Internet service to the area residents and to continue to improve service levels as opportunities allow and are always interested in exploring all opportunities to achieve improvements.

PLAN	Download	Upload	Data Limit	Monthly
Lite	8 Mbps	3 Mbps	60 Gb/mo.	\$44.00
Standard	10 Mbps	5 Mbps	100 Gb/mo.	\$64.00
Standard +	15 Mbps	5 Mbps	400 Gb/mo.	\$74.00
Entertainment	15 Mbps	5 Mbps	650 Gb/mo.	\$99.00
Entertainment +	15 Mbps	5 Mbps	1 Tb/mo.	\$149.00
Business	20 Mbps	5 Mbps	650 Gb/mo	
Business +	20 Mbps	5 Mbps	1 Tb/mo.	
Business Premium	20 Mbps	5 Mbps	Soft Unlimited	

A speed boost option may be available to increase download speeds by an additional 5 Mbps download and 3 Mbps upload.

XPLORNET - [HTTPS://GET.XPLORNET.COM/DISCOVERY-BC/](https://get.xplornet.com/discovery-bc/)

PLAN	DATA LIMIT Gb	Reg Month	Sale Month	6 Month	Annual
SAT 50	50	\$99.99	\$95	\$180	\$350
SAT 75	75	\$109.99	\$135	\$260	\$500
SAT 100	100	\$75	\$220	\$420	\$820

Download	10 Mbps
Upload	1 Mbps

Xplornet has entered into a lifetime agreement with Hughes Network Systems, LLC (Hughes), for substantially all of the Canadian satellite broadband capacity on Hughes' next-generation JUPITER 3 Ultra High-Density Satellite.

For rural Canadians, the JUPITER 3 satellite will make Internet download speeds of 100 Megabits per second (Mbps) available. Planned for launch in 2021, the satellite is designed to provide coverage of 90% of Canada's population and will bring about 50 Gbps of capacity to current and potential Xplornet customers.

CONNECTED COAST - SUBMARINE FIBRE ROUTES & LANDING SITES

On January 7th, 2021 it was formally announced that Baylink Networks was awarded the construction contract of the project.

More information is available on their website <https://connectedcoast.ca/>



The Connected Coast submarine fibre project will provide the vital backbone necessary to support the delivery of highspeed broadband Internet services to areas that are presently unserved or underserved.

Further investment will be necessary to provide a solution from the Connected Coast landing locations to the various residential, business, government, and institutions within each of the communities.

This can be achieved through a variety of methods including but not limited to:

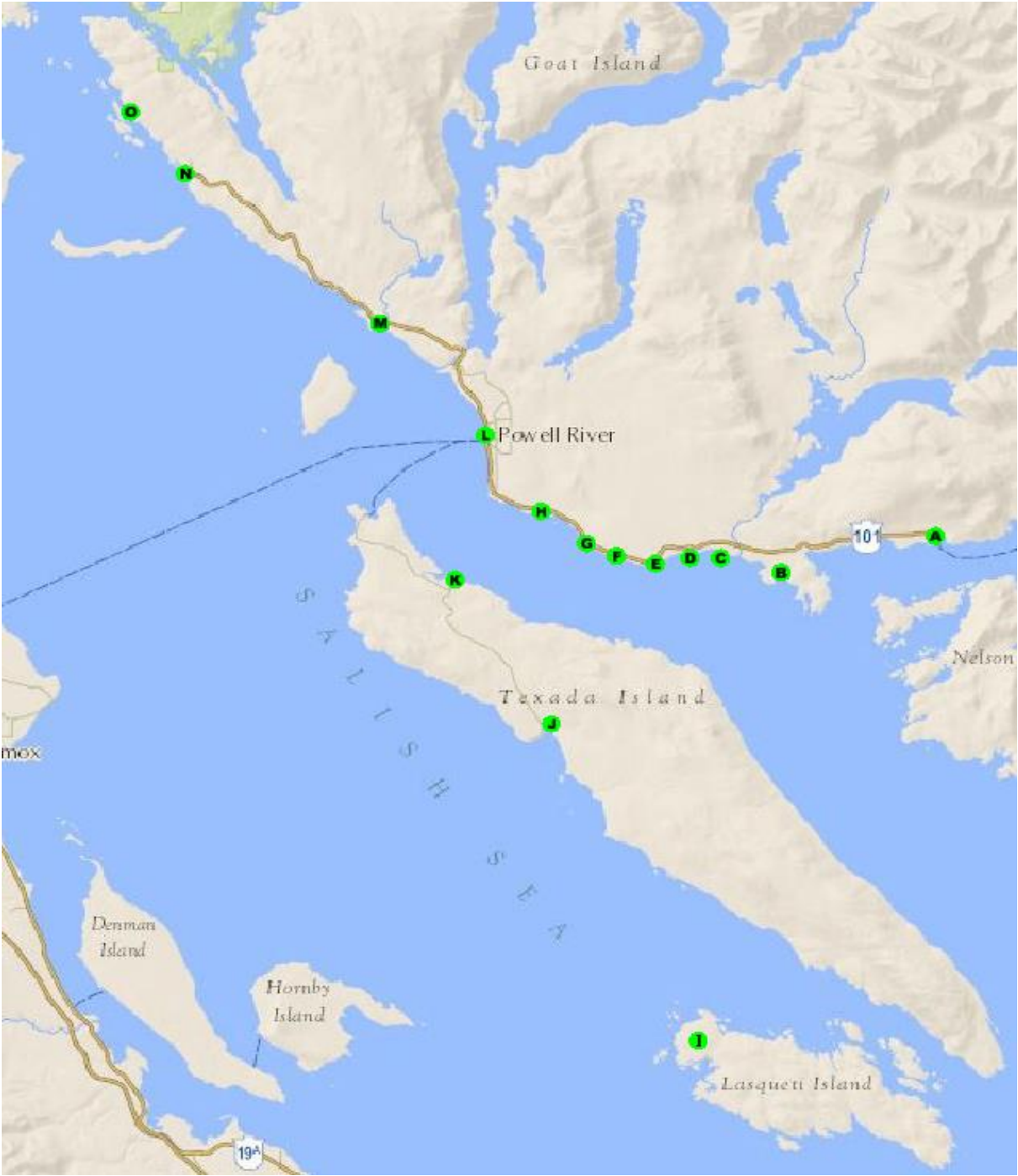
Fibre to the Premise

Mobile Wireless

Hybrid Fibre/Coaxial Network

Fixed Wireless

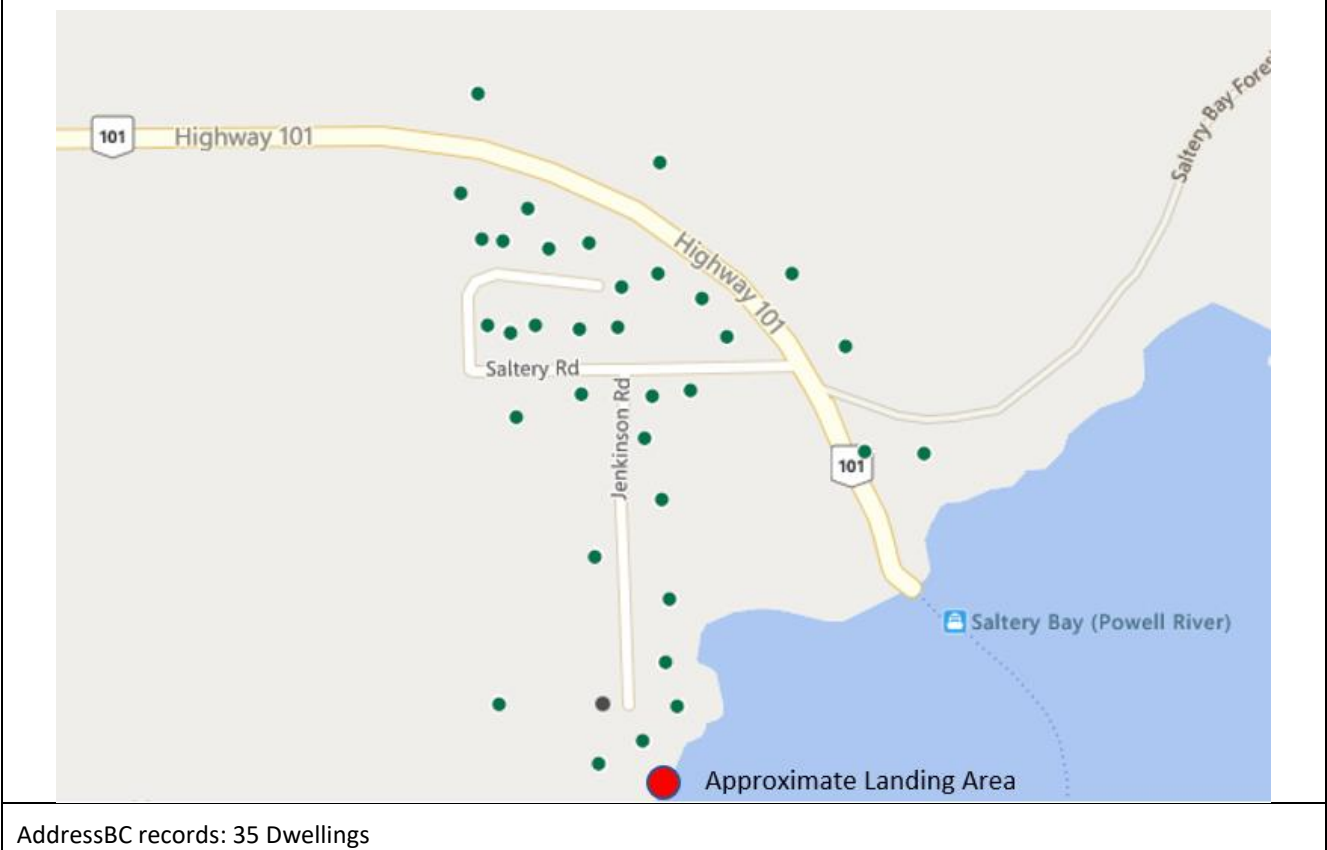
Coaxial Network





A	Saltery Bay	F	Lasqueti	K	Van Anda
B	Stillwater	G	Gillies Bay	L	Westview
C	Lang Bay	H	Pinetree	M	Slammon (Tla'amin Nation)
D	Brew Bay	I	Barney's Bar	N	Lund
E	Black Point	J	Myrtle Point	O	Bliss Landing

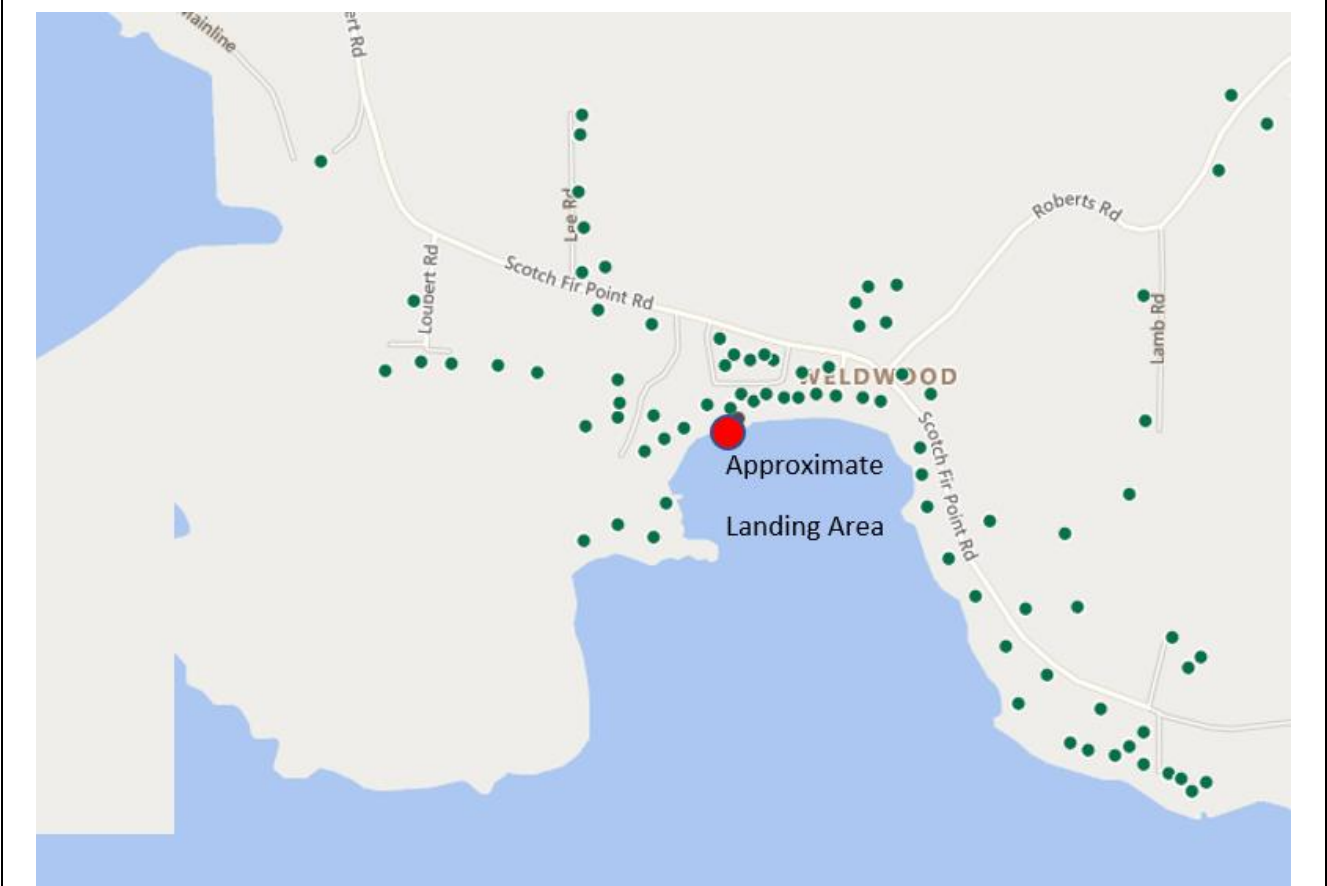
Latitude: 49.7808	Longitude: -124.181
	

Comments: We had a wonderful conversation with a local resident who explained how TELUS constructed a conduit from the pole pictured here to a new manhole hidden by the grass to the left and a conduit placement down to the water via the existing path and the placement of their fibre cable some time ago. A potential cost savings opportunity for the future Connected Coast fibre placement at this location. The existing pole line utilized by BCHydro and TELUS is in great condition and appears to have capacity for additional cable placements in the area. AddressBC shows 35 dwelling in the immediate area.



Latitude: 49.7627	Longitude: -124.3
	

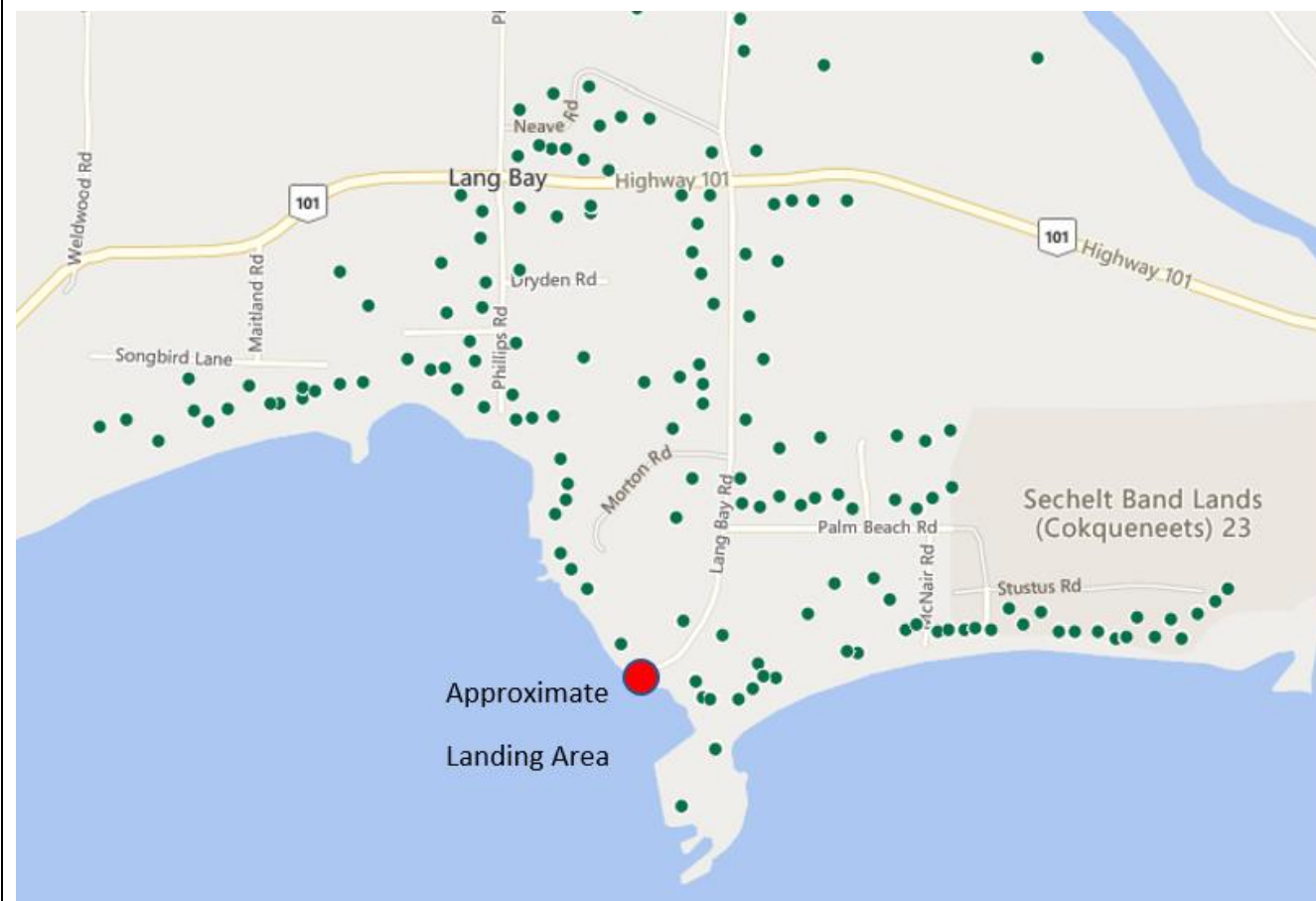
Comments: The Stillwater landing site is located on a public right of way and is a short distance from the shore to an existing utility pole line. Existing residents in the Stillwater area currently have access to high-speed broadband Internet services via Shaw Communications.



Latitude: 49.7722	Longitude: -124.347
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Comments: The Lang Bay landing site is located on a public right of way and is a very short distance from the shore to an existing utility pole line. This location is currently planned to be a splice location only. Existing residents in the Lang Bay area currently have access to high-speed broadband Internet services via Shaw Communications.



Latitude: 49.7707	Longitude: -124.37
	

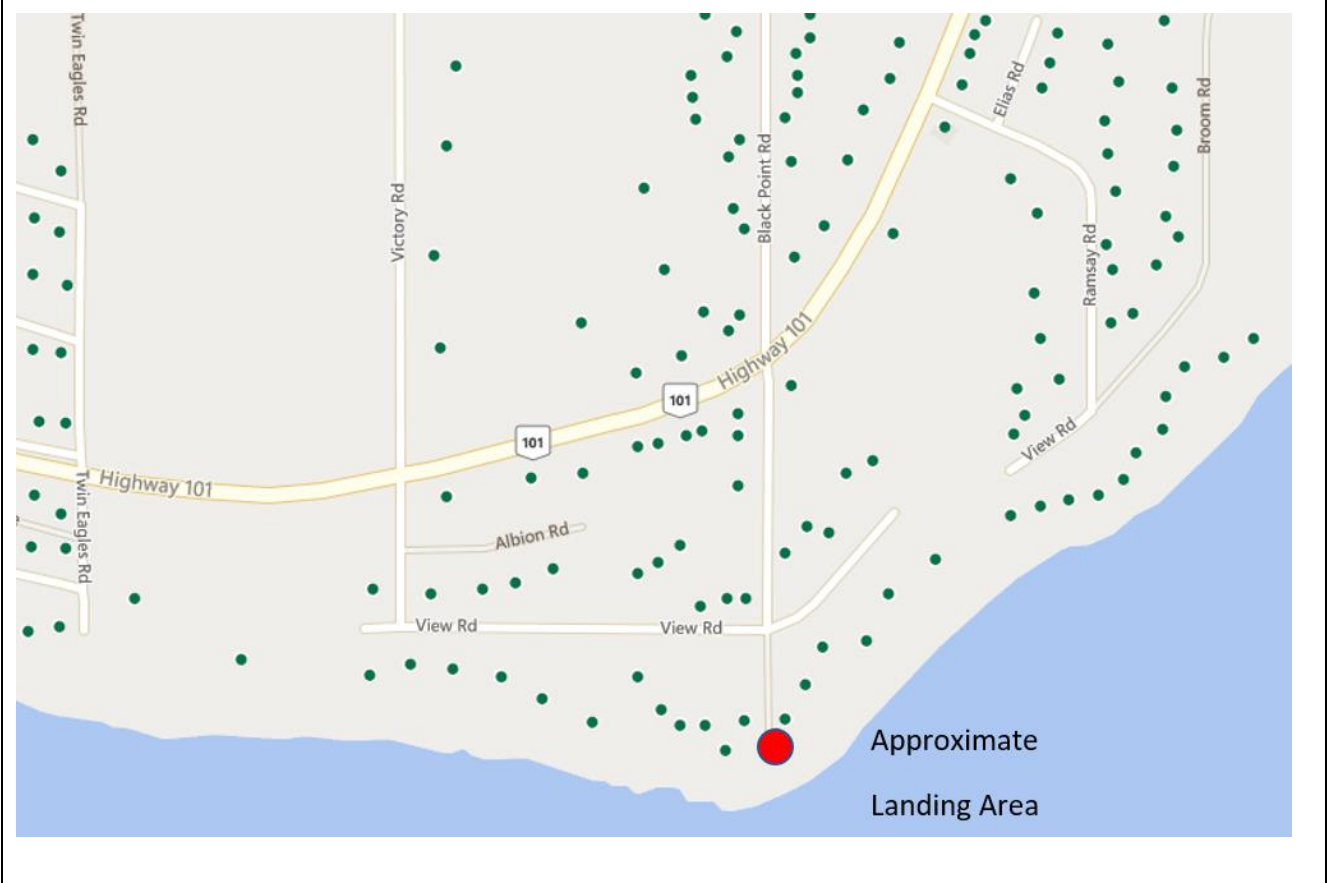
Comments: The Brew Bay landing site is located on a public right of way and is ~200 meters distance from the shore to an existing utility pole line. This location is currently planned to be a splice location only. Existing residents in the Brew Bay area currently have access to high-speed broadband Internet services via Shaw Communications.


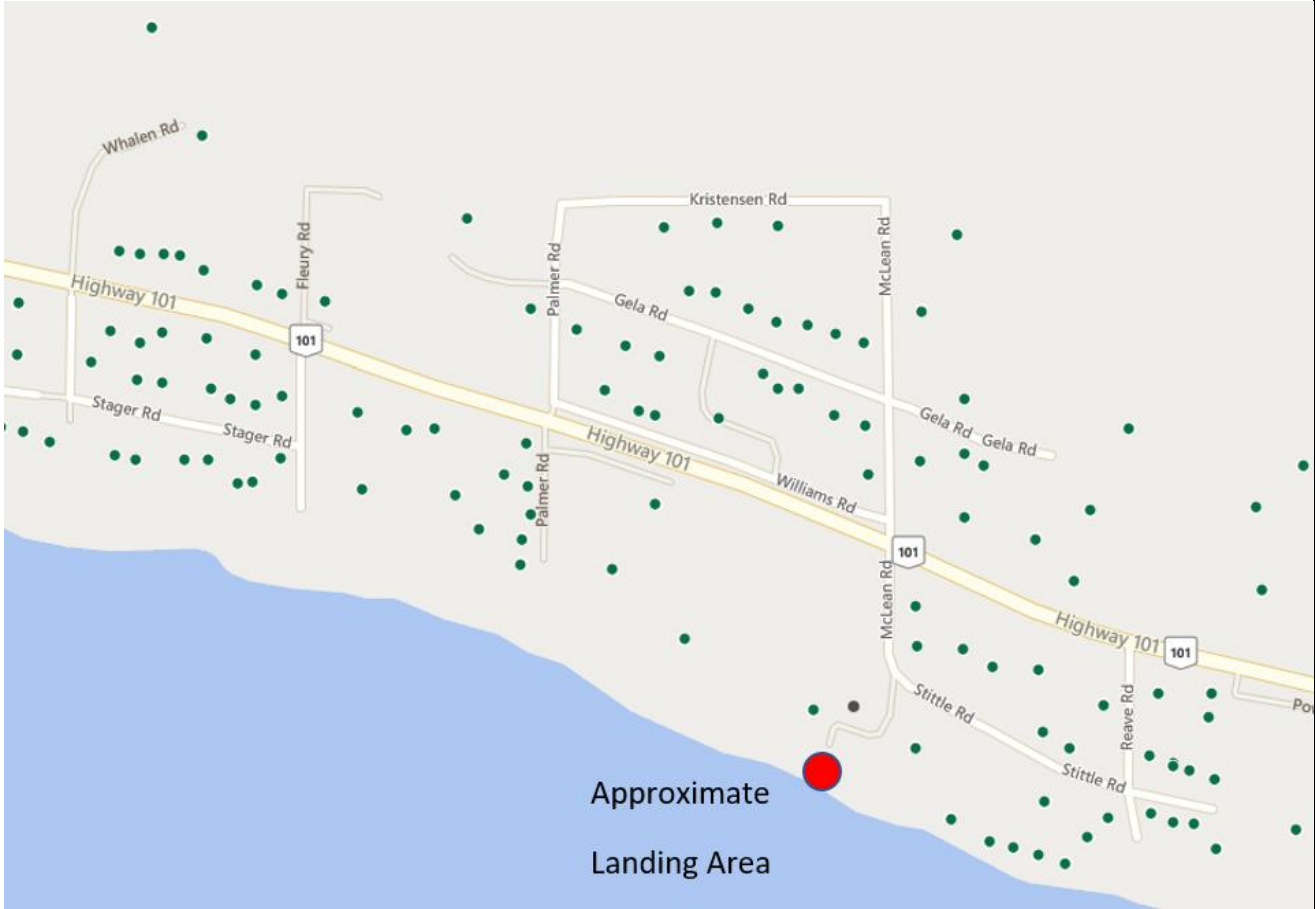


Latitude: 49.7669	Longitude: -124.396
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Comments: The Black Point landing site is located on a public right of way and is ~110 meters distance from the shore to an existing utility pole line. Existing residents in the Black Point area currently have access to high-speed broadband Internet services via Shaw Communications.



Latitude: 49.771	Longitude: -124.422
	
<p>Comments: The Pine Tree landing site is located on a public right of way and is ~100 meters distance from the shore to an existing utility pole line. Existing residents in the Pine Tree area currently have access to high-speed broadband Internet services via Shaw Communications.</p>	
	

Latitude: 49.7768	Longitude: -124.447
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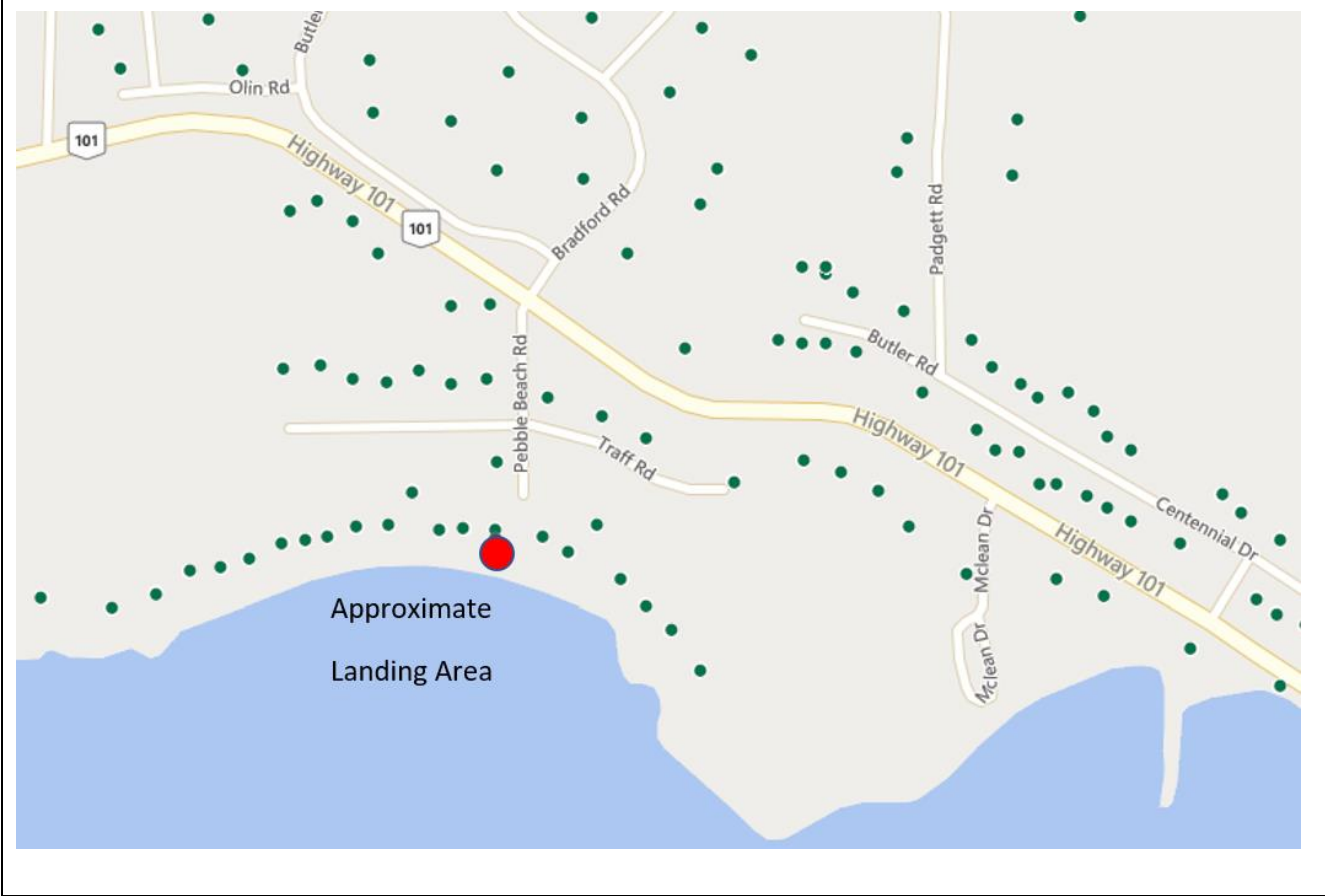


Comments: The Barneys Bar landing site is located on a public right of way and is ~100 meters distance from the shore to an existing utility pole line. Existing residents in the Barneys Bar area currently have access to high-speed broadband Internet services via Shaw Communications.



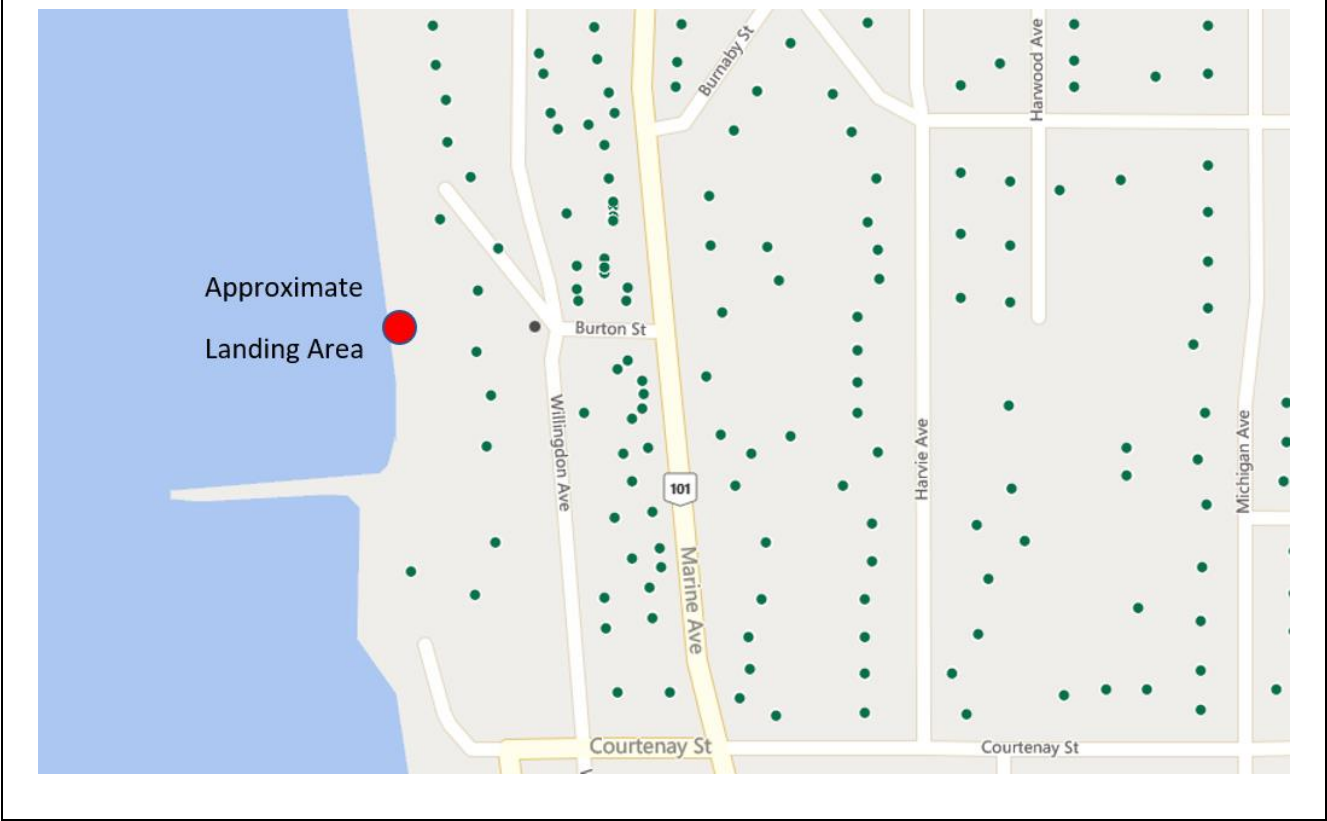
Latitude: 49.796	Longitude: -124.482
	

Comments: The Myrtle Point landing site is located on a public right of way and is ~100 meters distance from the shore to an existing utility pole line. Existing residents in the Myrtle Point area currently have access to high-speed broadband Internet services via Shaw Communications & TELUS.



Latitude: 49.8398	Longitude: -124.529
	

Comments: The Westview landing site is located on a public right of way and is ~50 meters distance from the shore to an existing utility pole line. Existing residents in the Westview area currently have access to high-speed broadband Internet services via Shaw Communications & TELUS.



Latitude: 49.8963

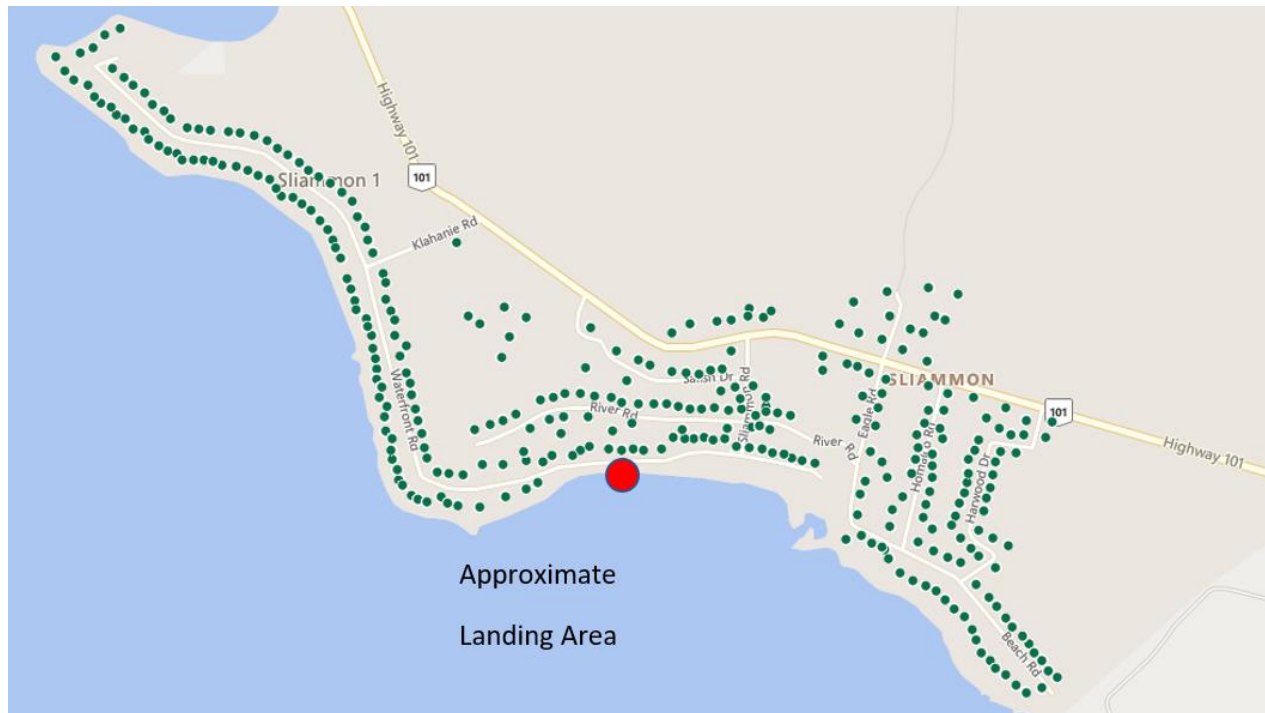
Longitude: -124.612



Access unavailable

At

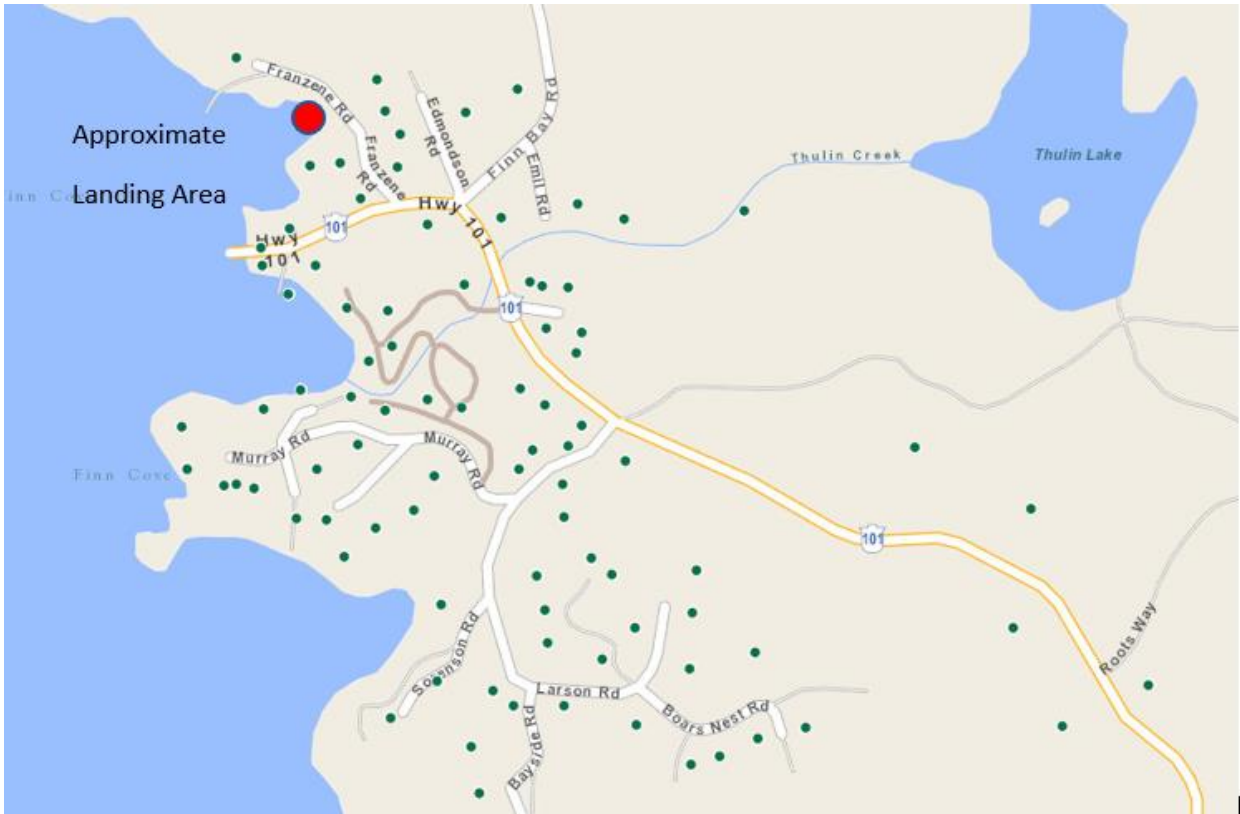
Time of Survey

Comments: The Sliammon landing site is located on Tla'amin First Nations land and is ~50 meters distance from the shore to an existing utility pole line. Existing residents in the Tla'amin area currently have access to high-speed broadband Internet services via Shaw Communications & TELUS.



Latitude: 49.9828	Longitude: -124.761
	

Comments: The Lund landing site is located on a public right of way and is ~50 meters distance from the shore to an existing utility pole line. Existing residents in the Lund area do not have access to landline broadband Internet services.



Latitude: 49.9828	Longitude: -124.761
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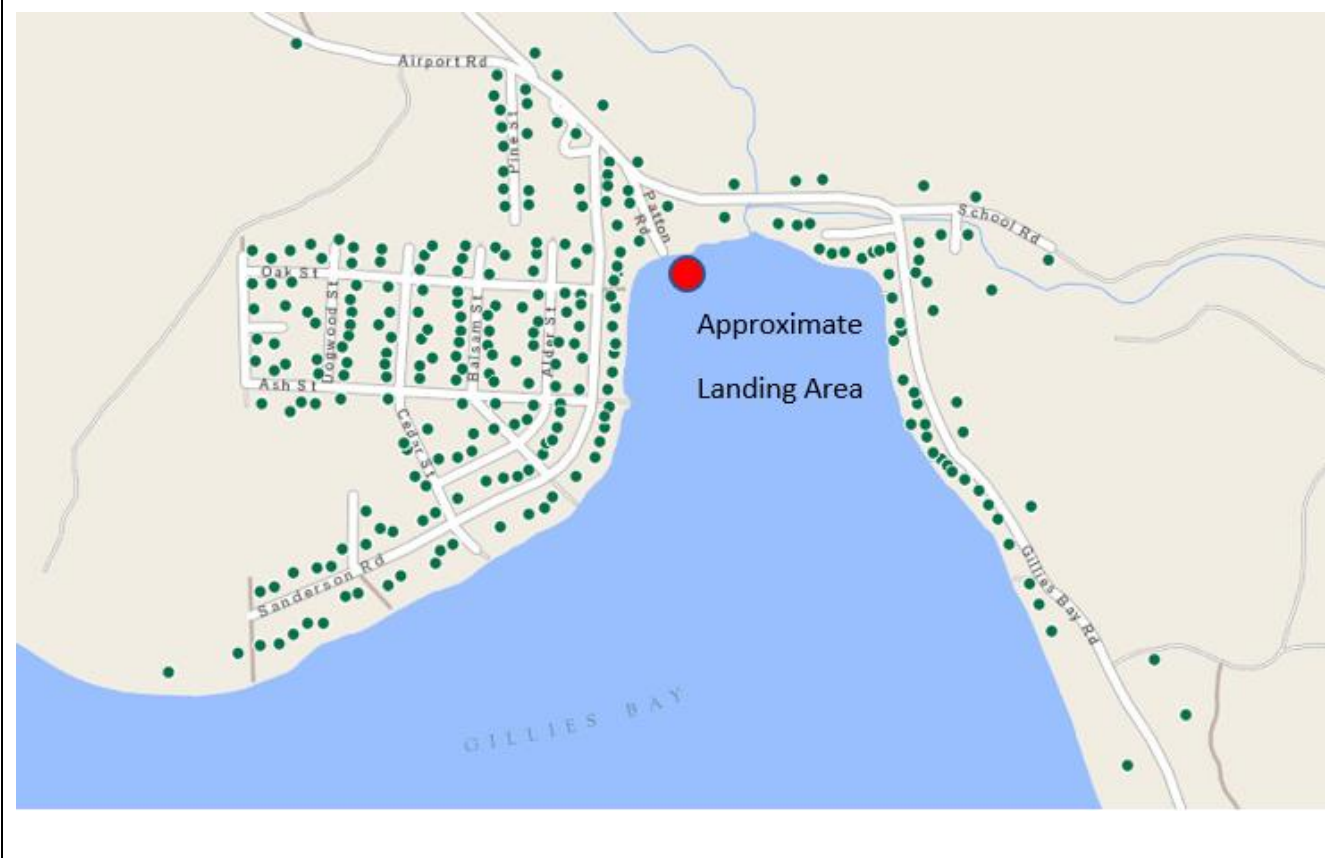


Comments: The Bliss Landing landing site is located on a public right of way and is ~50 meters distance from the shore to an existing utility pole line. Existing residents in the Bliss Landing area do not have access to landline broadband Internet services.



Latitude: 49.6801	Longitude: -124.483
	

Comments: The Gillies Bay landing site is located on a public right of way and is ~50 meters distance from the shore to an existing utility pole line. Existing residents in the Gillies Bay area currently do not have access to landline broadband Internet services.



Latitude: 49.4912

Longitude: -124.35

Photo Unavailable

Comments: The False Bay landing site is located on a public right of way near the BC Ferries Terminal site. Existing residents on the Lasqueti Island area do not have access to landline broadband Internet services.



INTERNET SPEEDS AND WHAT YOU CAN DO WITH THEM

0 - 5 Mbps	5 - 40 Mbps	40 - 100 Mbps	100 - 150 Mbps	500 - 1000+ Mbps
Checking email	Streaming Video	Streaming HD Video on a few devices	Streaming video in UHD on multiple screens	Doing a lot of almost anything
Streaming music on a device	Video Calling	Multiplayer inline gaming	Downloading files quickly	
Searching	Online gaming for one player	Downloading large files	Gaming online for multiple players	

How much download speed do I need?

You will require download speed to receive emails, download files or documents, and for watching videos. When video conferencing, it is the video and voice of the person you are calling with.

What you need will depend on what you intend to use the Internet for as per the examples shown in the table above.

How much upload speed do I need?

Your upload speed determines how fast you can upload content to the Internet. And it is not just files, as upload speed can affect your Facetime and Zoom quality, since you are essentially uploading a live video. If you are thinking of streaming on a site like Twitch or YouTube, you will need a high upload speed.

Measurements of Internet performance

Download Speed – How much data can be downloaded per second measured in Mbps

Upload Speed – How much data can be uploaded per second measured in Mbps

Latency – The time it takes for data to travel from one location to another measured in ms (milliseconds)

A ping test measures latency as a two-way trip from one location to another and back

COMMON DELIVERY METHODS

Actual download and upload speeds provided may differ

	F.T.T.H. Fibre to the Home	HFC or Coaxial Cable Network	Low Earth Orbit Satellite	LTE Wireless Network	Wi-Fi Wireless Network	Satellite
Current common Industry Offerings	Download/Upload 940 Mbps / 940 Mbps	Download/Upload 1.2 Gbps / 200 Mbps	Download/Upload ~300 Mbps / ~20 Mbps	Download/Upload ~50 Mbps / ~10 Mbps	Download/Upload 25 Mbps / 12 Mbps	Download/Upload 25 Mbps / 1Mbps
Future Planned Offerings	TBD	10 Gbps / 6 Gbps	Unknown	300 Mbps / 75 Mbps	Unknown	Unknown
Build Costs	High	High	Low for Customer	Medium	Medium	Low for Customer
Construction	Aerial &/or underground fibre placement, splicing, drops to buildings, building wiring and transceiver installation	Aerial &/or underground coax &/or fibre placement, splicing, outdoor active & passive installation, drops to buildings, building wiring and transceiver installation	Mount dish antenna at a location that provides line of sight to satellites path. Could be building, pole or tower. Wiring to building, building wiring and appliance installation	Single &/or multiple towers &/or building mounted transceiver installation, user building external antenna (if required) building wiring and transceiver installation	Single &/or multiple towers &/or building mounted transceiver installation, user building external antenna (if required) building wiring and transceiver installation	Mount dish antenna at a location that provides line of sight to satellite. Could be building, pole or tower. Wiring to building, building wiring and appliance installation
Maintenance	Very Low Typically, once the fibre has been installed there is little to no maintenance other than that unpredictable damage or forced relocation.	Medium to High Requires ongoing maintenance of outside active electronics, battery maintenance, Signal Leakage testing and repairs. Unpredicted damage or forced relocation.	Low Dish antenna may move or be pushed out of alignment, unpredicted damage, or electronic equipment failure	Low Requires tower safety maintenance, repairs to unpredicted damage and electronic equipment failures	Low Requires tower safety maintenance, repairs to unpredicted damage and electronic equipment failures	Low Dish antenna may move or be pushed out of alignment, unpredicted damage, or electronic equipment failure

	F.T.T.H. Fibre to the Home	HFC or Coaxial Cable Network	Low Earth Orbit Satellite	LTE Wireless Network	WI-FI Wireless Network	Geo Stationary Satellite
Vulnerabilities	Direct damage from exterior forces such as tree falling, auto accident, cut by excavator etc... water infiltration into a splice	Direct damage from exterior forces such as tree falling, auto accident, cut by excavator etc..., electronics failure, power outages	Direct damage, electronics failure Vegetation growth	Direct damage, electronics failure Vegetation growth	Direct damage, electronics failure Vegetation growth	Direct damage, electronics failure Vegetation growth
Service Impacting	Fibre break, electronic device failure, water in splice location	Fibre or coaxial cable break, electronic equipment failure, extended power outage	Satellite Failure, Ground station failure, Solar Flares, Customer Antennas movement, weather, Customer equipment	Anything that impedes the line of sight will impact the service quality i.e. rain, snow, fog, obstructions such as tree and buildings, other WI-FI signals interference	Anything that impedes the line of sight will impact the service quality i.e. rain, snow, fog, obstructions such as tree and buildings, other WI-FI signals interference	Satellite Failure, Ground station failure, Solar Flares, Customer Antennas movement, weather, Customer equipment
PROS	Low Maintenance Near symmetrical service Very high speeds	Low Maintenance Very High Speeds Service becoming increasingly more symmetrical	Mixed reviews from customers so far but mostly positive.	Easier to build a business case due to typically lower capital build costs in comparison to other options	Easier to build a business case due to typically lower capital build costs in comparison to other options	Available for remote locations or where there are no other options
CONS	Expensive to build with the price increasing rapidly as the area gets more rural	Expensive to build with the price increasing rapidly as the area gets more rural Requires more maintenance than fibre	Must have a clear line of sight to satellites Not fully approved for delivery in Canada Yet (Only Beta Test available)	Must have a clear line of sight to terrestrial transceiver such as tower or building Limited speeds	Must have a clear line of sight to terrestrial transceiver such as tower or building Limited speeds	Must have a clear line of sight to satellite Limited speeds

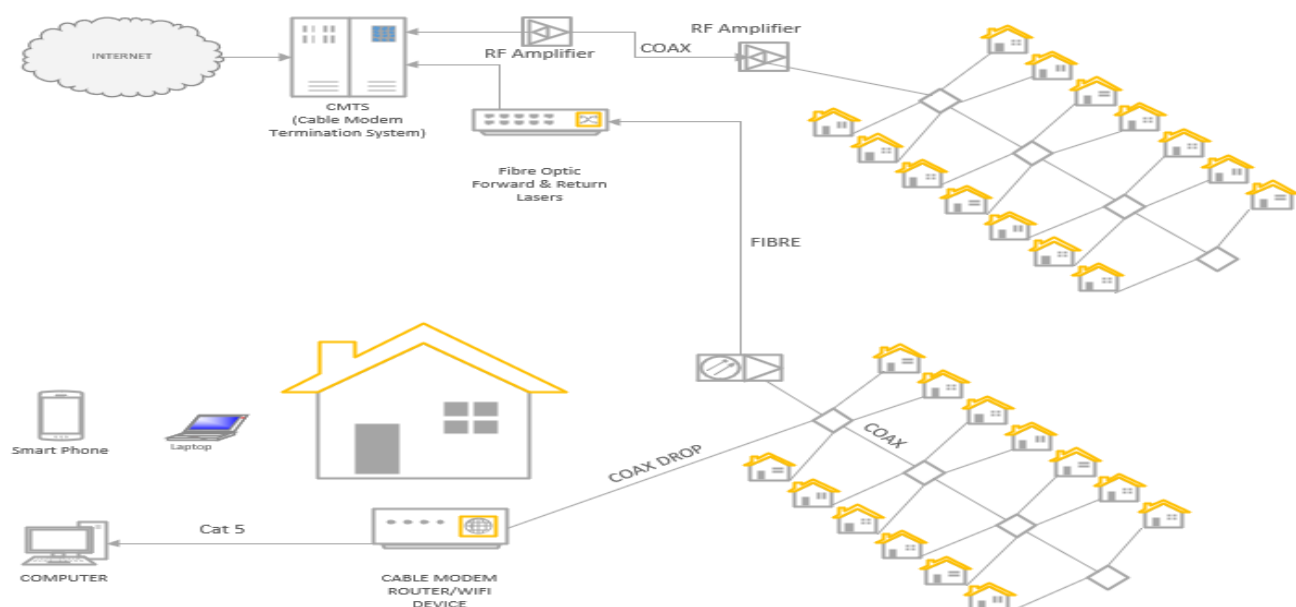


CMTS



Cable Modem

DOCSIS release	Max Download	Max Upload
DOCSIS 2	40 Mbps	30 Mbps
DOCSIS 3.0	1.2 Gbps	200 Mbps
DOCSIS 3.1	10 Gbps	1 Gbps
DOCSIS 4.0 Future	10 Gbps	6 Gbps



Coaxial cable system technologies continue to evolve at a rapid pace. With the latest version being developed to provide 10 Gbps Downstream and 6 Gbps Upstream connections. This method requires customers to be serviced via coaxial cables connected to a local area fibre node with few additional amplifiers.

Today there are two basic methods of design.

1. A coaxial cable only system with amplifiers placed at intervals to extend the area serviced. For the delivery of Internet only services this method would work well in a smaller community with a few hundred customers.
2. With the addition of fibre optic nodes placed closer to the customers the design now allows for segmentation of groups of customers. In addition to higher quality service and greater reliability it also results in increased Internet connection speeds and manages congestion of the network.

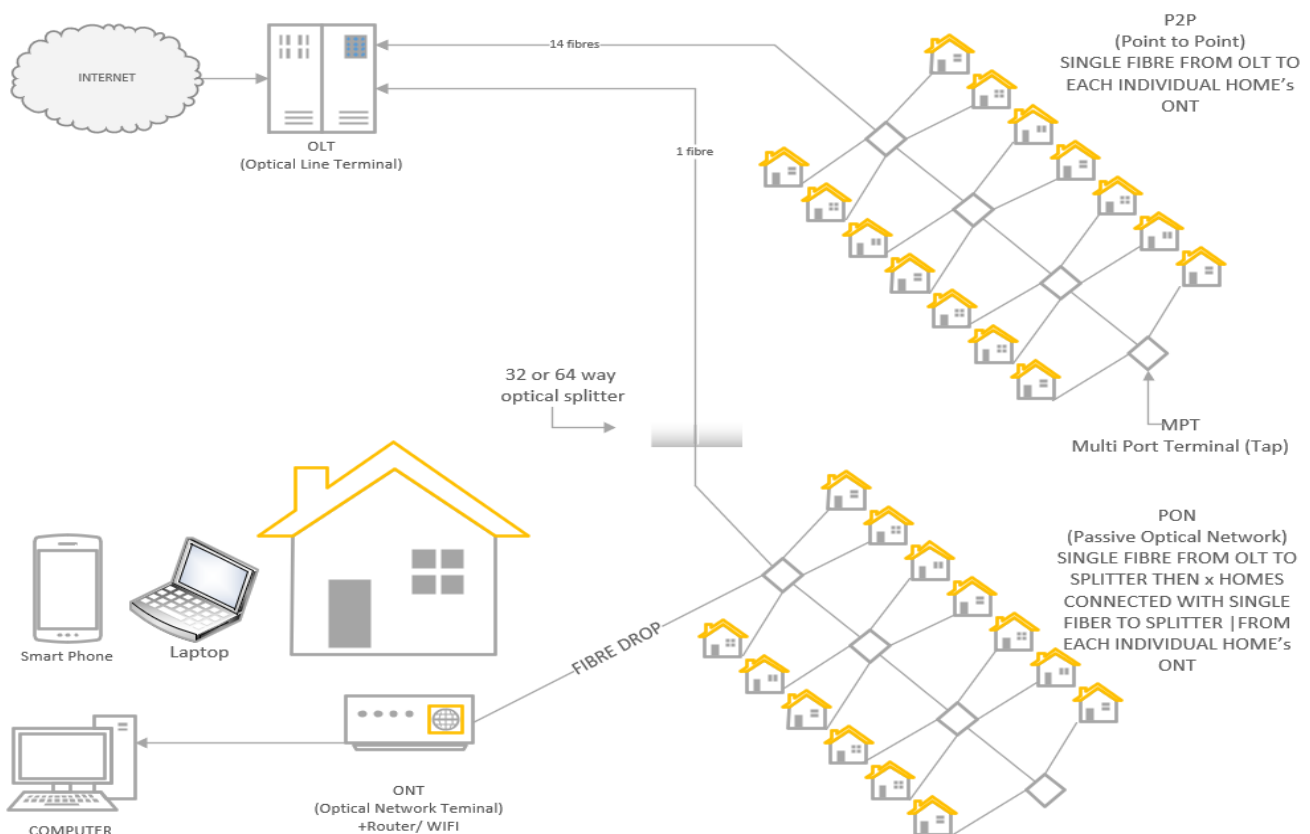
It was existing Cable TV operators that truly brought high speed Internet to their customers many years ago by adding new technology to their existing system and this technology continues to evolve at a rapid pace.



An Optical Line Terminal (OLT) is the endpoint hardware device in a Passive Optical Network (PON). An OLT has two primary functions: Converting the standard signals used by a FiOS service provider to the frequency and framing used by the PON system.

ONT stands for Optical Network Terminal. The ONT connects to the optical fibre cable.

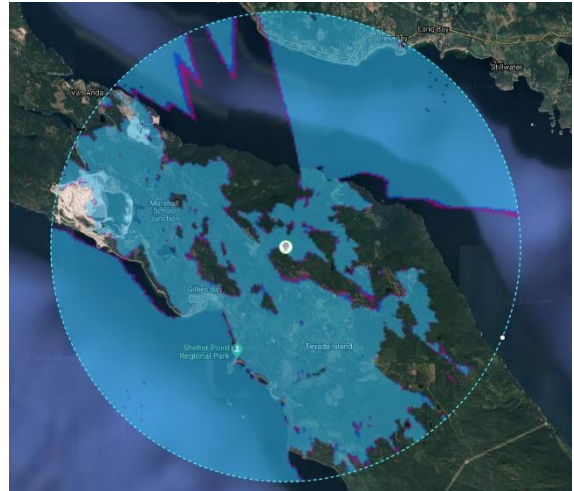
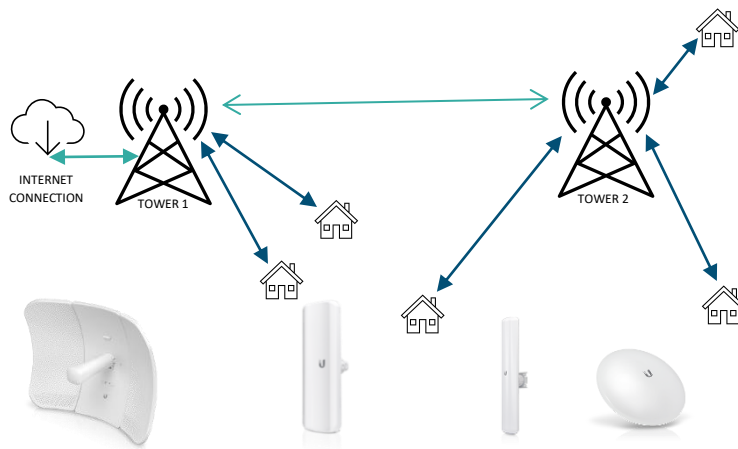
It connects to your router via a LAN / ethernet cable and translates light signals from the fibre optic line into electronic signals that your router can read.



There are two most significant advantages with a passive optical network (PON). Firstly, there is no active equipment other than the origination location and the customer's location. Secondly the network is almost always symmetrical, meaning speed are the same up and down. Additionally, the congestion of the network can be managed entirely from the origination location, with some exceptions when it comes to expansion.

Wireless networks have and continue to provide Internet services in a great many areas throughout the region. The location of transceiver tower(s) is critical for the resulting coverage area. All wireless services whether Wi-Fi or Cellular are subject to coverage limitations due to obstructions such as buildings, trees and topology.

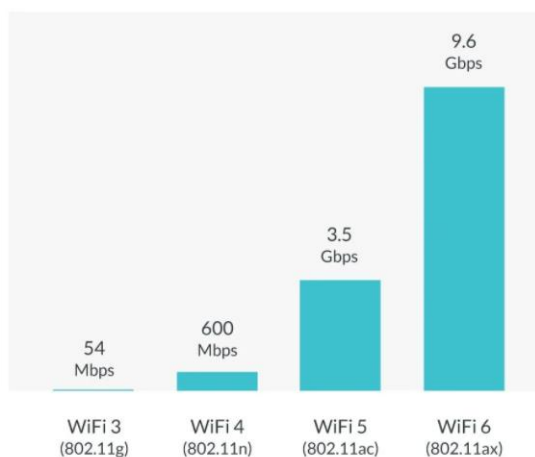
Tower construction costs can be very high depending on the height and location of the tower. Cost for unlicensed Wi-Fi are low in comparison to FTTH or HFC methods.



A typical Wi-Fi network design would require a connection to the Internet. This would connect to a transceiver/antenna on a strategically placed structure like a tower, building or pole. There can be multiple towers that are connected with a PTP (Point to Point) method and each tower can then have a PTMP (Point to Multi Point) Antenna(s) to deliver service to customers.

Wi-Fi service levels are significantly below current fibre or coaxial methods, but continued improvements are still occurring. Governments approving more bandwidths will also play a role in improving wireless capabilities and speeds.

IEEE Standard maximum throughput speeds



These speeds are theoretical maximums, and it is unlikely to ever reach those speeds in real-world Wi-Fi use.

There are newer significant opportunities for improvements to Wi-Fi service levels.

The newest version Wi-Fi 6 on the 2.4 and 5 GHz bands is available in Canada. Canada has not yet approved the spectrum allocation for the 6 GHz band also known as Wi-Fi 6E.

November 19, 2020 – The Government of Canada launches consultation on proposal for license-exempt spectrum to support greater choice and affordability of wireless services. The proposal would triple the amount of license-exempt spectrum available for Wi-Fi

CONSTRUCTION METHODS COMPARISONS

	Advantages	Disadvantages
Aerial Leased	<ul style="list-style-type: none"> • Widely available • Can be several potential leasers • Not responsible for structure or its maintenance costs • Construction costs generally lower than underground 	<ul style="list-style-type: none"> • Open to weather & traffic • More susceptible to service interruption due to damage • Approval to use required • Ongoing lease costs
Aerial Built & Owned	<ul style="list-style-type: none"> • No leasing cost 	<ul style="list-style-type: none"> • Rarely done as there are usually poles already on both sides of road or little desire by local government to approve if not already there • Expensive to build • Structure maintenance costs • Approval to construct is required • Increased taxable asset costs
Underground Leased	<ul style="list-style-type: none"> • Commonly available • Less susceptible to weather • Not responsible for structure maintenance costs • Lease cost higher than aerial lease 	<ul style="list-style-type: none"> • Available capacity issues more likely • Approval to use required • Ongoing lease costs
Underground Built & Owned	<ul style="list-style-type: none"> • Less susceptible to weather 	<ul style="list-style-type: none"> • More costly • Approval to construct is required • Structure maintenance costs • Increased taxable asset costs
Submarine	<ul style="list-style-type: none"> • Provides connectivity where no other viable or cost-effective option is available 	<ul style="list-style-type: none"> • Expensive • Approval to construct is required • Environmental impact studies • Archeological reports
Towers	<ul style="list-style-type: none"> • Fewer locations • Less infrastructure overall 	<ul style="list-style-type: none"> • Towers unpopular to public • Land availability challenging • Land leasing cost • High tower construction cost • Approval to construct is required • Line of Sight challenges

There are several factors that have a direct impact on the FTTH or HFC construction costs for a specific project and are unpredictable.

- I. Make-Ready
 - a. Condition of existing poles/duct and need for remediation / replacement or new duct
 - b. Capacity of existing strand/duct and need for replacement or new additional placement
 - c. Adequate anchoring and need for replacement or additional anchoring
 - d. Easement agreements with landowners for additional anchors that extend into private property
 - e. Engineering and application costs
- II. Mobilization/Demobilization – cost is increased for remote areas relative to the contractor’s home base and local per diem rates
- III. Transportation costs to get equipment and materials to the build site

Make-Ready is specifically a cost that is determined through the permit application process by the utility owner of the structure.

NETWORK BUILD MATERIALS

Fibre to the Home/Premise

- Building location for network electronics, customer service, fleet and warehousing
- Fibre optic Network Electronics including Customer Premise Equipment
- An Internet connection service (This may require additional build costs)
- Fleet Vehicle(s) Bucket Truck?
- Network Fibre Cables, Multi Port Taps, drop materials

Coaxial Cable or Hybrid Fibre Coaxial Networks

- Building location for network electronics, customer service, fleet, and warehousing
- Fleet Vehicle(s) Bucket Truck?
- Coaxial Mainline Cables & fibre cable in HFC networks
- Power Supplies to power outside network equipment
- Passive equipment, Taps, Splitters, Couplers, and fibre splice enclosures in HFC networks
- Active equipment, Amplifiers and Node in HFC systems
- DOCSIS equipment CMTS device, customer modems
- An Internet connection service (This may require additional build costs)

Wireless Networks

- Building location for network electronics, customer service, fleet, and warehousing
- Fleet Vehicle(s)
- Towers, Customer Antennas and Routers

FIBRE TO THE HOME, COAXIAL CABLE SYSTEMS & HYBRID FIBRE/COAXIAL

Support Structure Access Agreements

To build a Fibre, Coaxial or combination of the two, it is necessary to have support structure like pole line or conduit infrastructure. This can be achieved by ownership such as utility companies like BCHydro, TELUS and FortisBC, each of whom own their own poles in addition to sharing ownership in other poles.

Alternatively, leasing access can be achieved through access agreements. In the case of TELUS infrastructure, there is a federally regulated tariff that regulates requirements and rates. BCHydro is regulated by the BC Utilities commission. A Support Structure Agreement would need to be reached with one or more of these infrastructure owners to build and maintain this type of network. These access agreements come with annual lease costs and responsibilities including construction standards and maintenance aspects.

The complete approved Tariff document refers to many specific conditions and requirements related to the above rates.

Building lease space

Depending on the size of the system a certain amount of building space will be required to house the network equipment.

Plant Maintenance

Fibre to the Home/Premise

- FTT* networks require very low levels of maintenance as they are passive and contain no active electronics outside of the origination location and subscribers home equipment.
- Repair from damage occurring due to accidents or storms events.

Coaxial Cable or Hybrid Fibre Coaxial Networks

- significantly more maintenance is required because of having numerous active pieces of equipment. These require periodic alignment and potential replacement due to failure.
- Other failures do to age and environmental wear
- Signal Leakage detection testing and repair requirements
- Stand-by Power Supply battery maintenance
- Accident and Storm damage repairs

FIXED WIRELESS NETWORKS

The placement of network antennas / transceivers which are typically attached to buildings, mounted on towers or atop special extended utility poles. Each of these options will most likely required lease payments for land, building or poles.

Internet connectivity

An Internet Service Provider (ISP) must have a connection to the Internet. This connection comes with a cost usually based on speed, capacity, and volume of traffic as well as the tier level of the new or existing ISP. This connection can be secured through many sources of larger ISPs who are generally broken down into the follow Tier types as well as resellers.

A **Tier 1** ISP only exchanges Internet traffic with other Tier 1 providers on a non-commercial basis via private settlement-free peering interconnections. They will also interconnect at Internet Exchange Points (IXPs). Tier 1 ISPs can deliver the best network throughput over the Internet backbone through these private peering connections because they own their network infrastructure and have direct control over how traffic flows through these connections.

A **Tier 2** ISP is a service provider that utilizes a combination of paid transit via Tier 1 ISPs and peering with other Tier 2 ISPs to deliver Internet traffic to end customers through Tier 3 ISPs. Tier 2 ISPs are typically regional or national providers. Only a few Tier 2 ISPs can provide service to customers on more than two continents. Often, they will have slower access speeds than Tier 1 ISPs and are at least one router hop away from the backbone of the Internet.

A **Tier 3** ISP is a provider that strictly purchases Internet transit. A Tier 3 provider is by definition primarily engaged in delivering Internet access to end customers. Tier 3 ISPs focus on local business and consumer market conditions. They provide the "on-ramp" or local access to the Internet for end customers, through cable, DSL, fibre or wireless access networks. Their coverage is limited to specific countries or sub regions, such as a metro area. Tier 3 ISPs utilize and pay higher-tier ISPs for access to the rest of the Internet.

Other costs for all methods of delivery will include:

- Customer Service Staff
- Maintenance Staff
- Installations staff
- Electricity service
- Telephone Service
- Equipment repair Inventory
- New sales inventory
- Customer Billing System
- Accountant

In addition to previously mentioned elements, exact cost for any delivery method would depend on the size of the network, nearest Internet connection point and the number of customers.

The following proposed solutions were created with a desktop pricing model based off recent actual project detailed designs and costing estimates and are only provided as an example of potential cost ranges for the network option).

Actual costs estimates would require field surveys, completed designs and actual permit submissions to ascertain Make-Ready costs which are beyond the scope of this report.

LASQUETI ISLAND

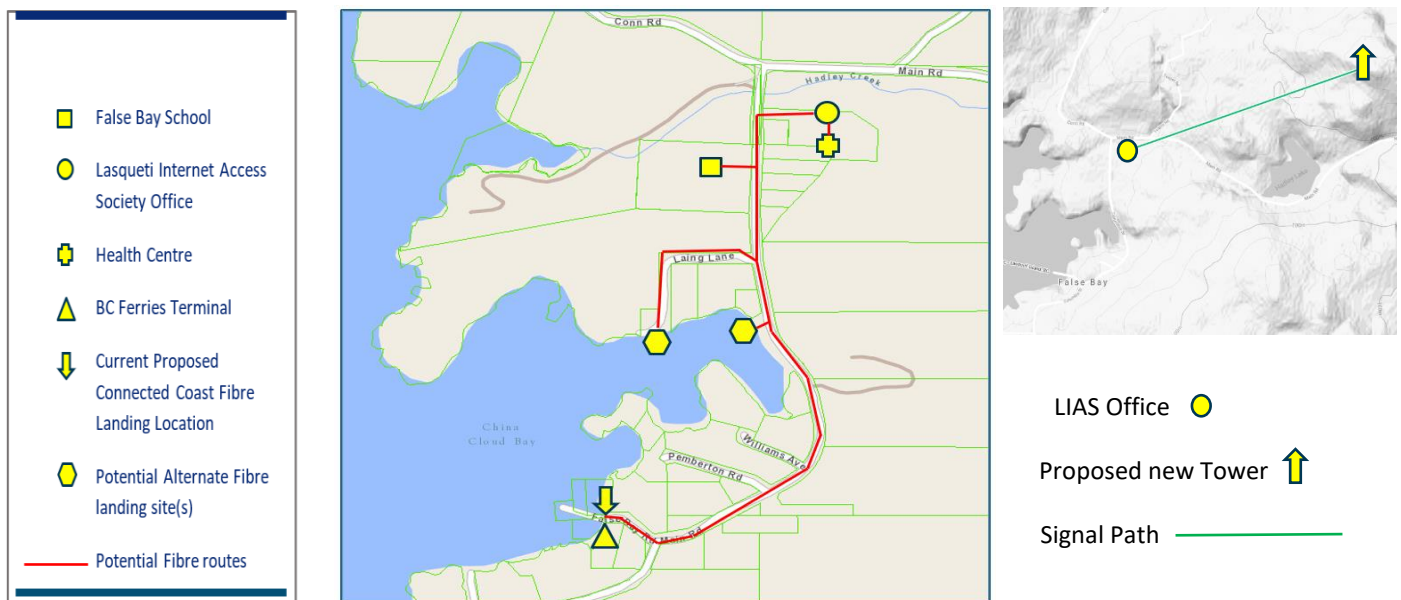
Current known services available on Lasqueti Island include:

- Lasqueti Internet Access Society Wi-Fi
- Cellular Services
- Xplornet Satellite

Our assessment of Lasqueti Island was somewhat limited as there are no geographically assigned address points. Ortho photos were used to the best of our ability to identify potential customer locations. Presently Lasqueti Island does not have an electrical power grid and community plans state that all communications services cannot be placed on pole lines and are to be placed underground. This would significantly drive-up construction costs for any FTTH or HFC solution into the millions of dollars. \$2,970,644 - \$3,733,694. A hybrid approach of some fibre and some fixed wireless access points would decrease these costs.

There is a proposed landing site for the Connected Coast fibre near the False Bay Ferry Terminal location with an additional proposed plan for a fibre connection to the False Bay Elementary school.

The LIAS would be able to construct a fibre connection from the landing site location to their nearest tower location. This will eliminate the need for their existing radio system currently used to obtain Internet connectivity from Parksville. And provide much greater bandwidth and source reliability.



Depending on the chosen fibre landing location a build cost for placement of an underground conduit system and fibre would be in the range of .25Km to 1.2 Km of \$70,000 to \$300,000. This would be mostly eliminated if the fibre to the Health Centre is placed by the Connected Coast Project.

Additional costs would be incurred to construct a Wi-Fi link from the office to a new proposed tower along with upgrades to connect to and improve their existing network \$100,000 – \$250,000.



 <div>PREPARED BY: DR. FRANKIE CHAMBERS, DISTRICT MANAGER, 2020-2021</div>	LEGEND		 <div>qathet REGIONAL DISTRICT</div> <div>PROPRIETARY INFORMATION THIS DOCUMENT IS THE PROPERTY OF THE REGIONAL DISTRICT OF QATHET. IT IS TO BE USED ONLY FOR THE PURPOSES FOR WHICH IT WAS PREPARED AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM.</div>	LESQUETI ISLAND		ESTIMATED ROUTE METERS 15,261m	
	 Support Structure Route	 Address location		ADDRESS COUNT: 246	TITLE: ROUTE METERS	SHEET NO. 1 OF 1	
				DRIFTWOOD PROJECT # 20202005	LOCATION: SALTREY BAY		
				SCALE: N/A			
				SHEET SIZE: B			
DRAWN BY: CHERYL SAELE							
CHECKED BY: CAS							
PLOT DATE: 02-FEB-2021							

Current known services available in the Salterty Bay area include:

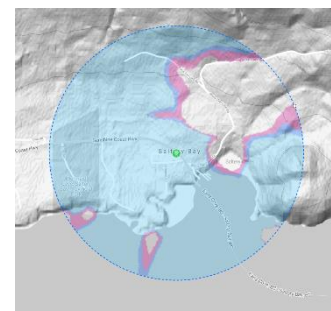
- RainCoast Wi-Fi
- Cellular Services
- Xplornet Satellite

The proposed landing site for the Connected Coast Project with a switch offering Multi Gb service will open the opportunity for an existing or new provider to connect and deliver broadband Internet services to the area approximate 36 addresses.

It would be necessary to have a structure of some kind that would have power service and be able to house the Connected Coast Switch along with whatever service equipment required for the last mile delivery method selected. A new terrestrial fibre would be spliced to the Connected Coast fibre FOSC located on the shoreline and placed from there to the central distribution location.

Wi-Fi / LTE – Requirements for this method would include the following elements:

- Network design & Testing
- Base station location, building attachment, pole top or tower
- Contract with BCHydro or TELUS to use their aerial support structure or permit approval to trench and construct a conduit system
- Fibre build from Base location to Connected Coast Landing Site
- Service contract with Connected Coast provider



A cost estimate for this option would require details resulting from a tested design.

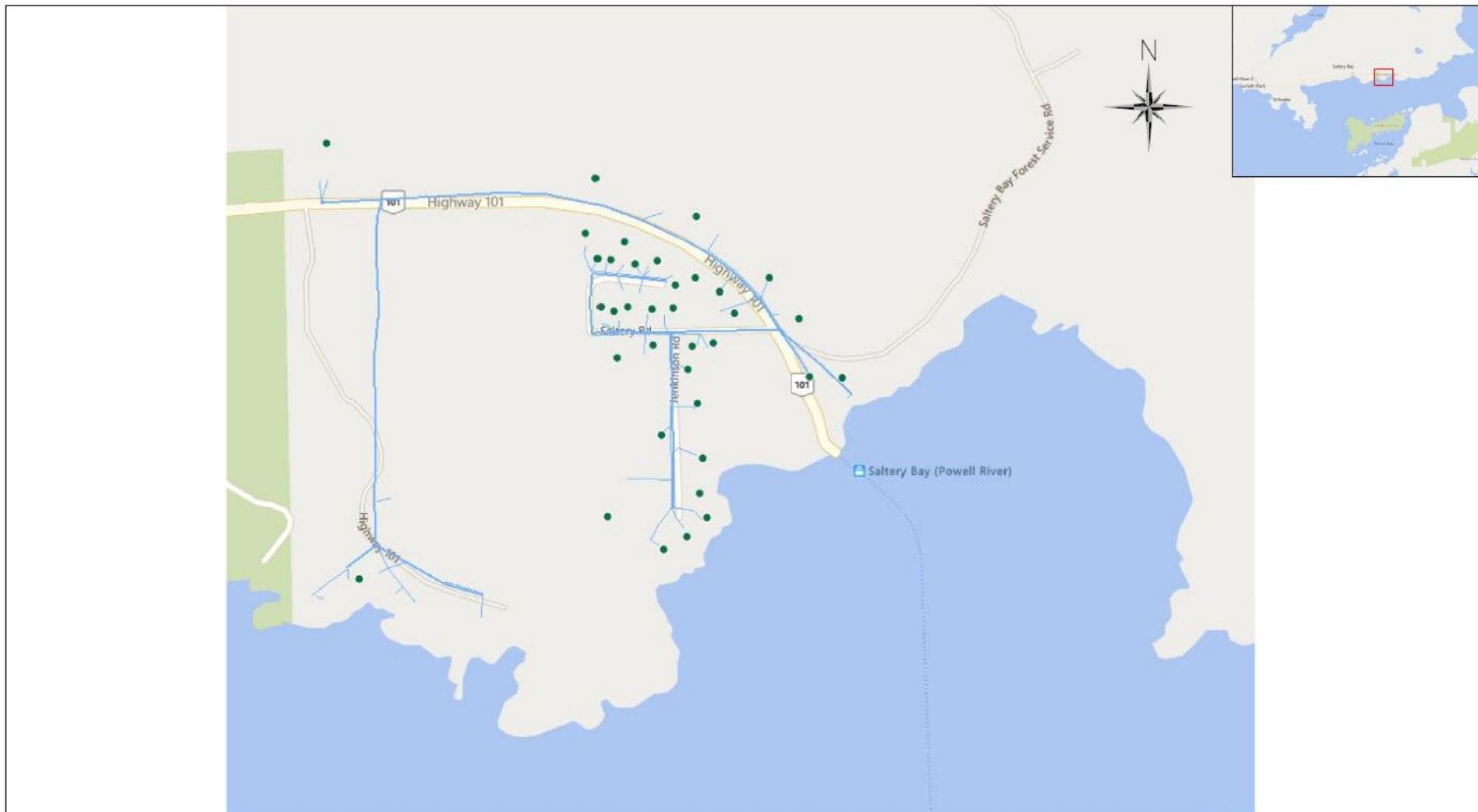
FTTH – Requirements for this method would include the following elements:



- Network design
- Secure a structure with power and adequate space for equipment
- Contract with BCHydro or TELUS to lease their aerial support structure
- Application of proposed fibre placement to selected utility
- Fibre build from Base location to Connected Coast Landing Site
- Placement of main fibre, fibre drops, splicing and activation
- Installation and activation of CPE for customers
- Service contract with Connected Coast provider



Estimated cost range - \$163,786 - \$176,511 / \$4,550 - \$4,903/per address

(The biggest variables in cost would come from Make-Ready (See page 6) and the quantity on conduit construction required.



<div></div> <div>PREPARED BY: DRIFTWOOD COMMUNICATIONS LTD. 2000 UNIVERSITY ROAD VANCOUVER, BC V6T 1A1</div>	LEGEND		<div></div> <div>qathet REGIONAL DISTRICT</div> <div>PROPRIETARY INFORMATION THIS DOCUMENT IS THE PROPERTY OF QATHET REGIONAL DISTRICT. IT IS TO BE USED ONLY FOR THE PURPOSES SPECIFIED IN THE CONTRACT. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, WITHOUT PERMISSION IN WRITING FROM QATHET REGIONAL DISTRICT.</div>	SALTREY BAY		ESTIMATED ROUTE METERS 2,545m	
	Support Structure Route			ADDRESS COUNT: 36		TITLE: ROUTE METERS	
	Address location			DRIFTWOOD PROJECT # 20202005		LOCATION: SALTREY BAY	
				SCALE: N/A			
				SHEET SIZE: B			
DRAWN BY: CHERYL SAELE					SHEET NO. 1 OF 1		
CHECKED BY: CAS							
PLOT DATE: 02-FEB-2021							

Current known services available in the Lund area include:

- Raincoast Wi-Fi
- TwinComm Wi-Fi / LTE
- Cellular Services
- Xplornet Satellite

The following are some of the options available for the Lund area shown on the following map.

1. Existing providers Shaw and/or TELUS could extend their broadband service areas into the Lund region.
2. An alternate new or existing other ISP could construct a new FTTH Network or HFC Network.

The proposed landing site for the Connected Coast Project with a switch offering Multi Gb service will open the opportunity for an existing or new provider to connect and deliver broadband Internet services to the area approximate 359 Addresses.

It would be necessary to have a structure of some kind that would have power service and be able to house the Connected Coast Switch along with the necessary service equipment required for the last mile delivery method selected.

FTTH – Requirements for this method would include the following elements:

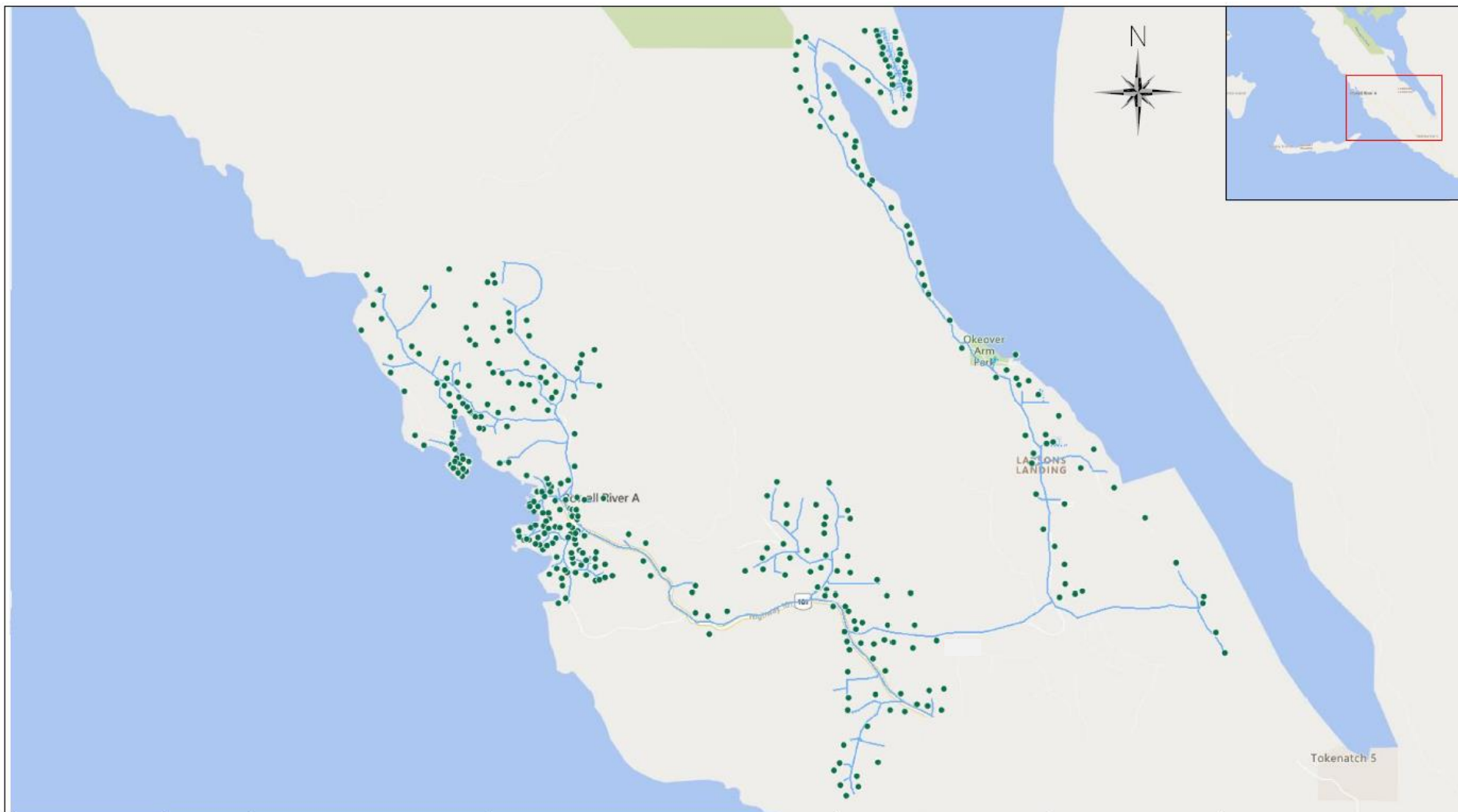
- Network design
- Secure a structure with power and adequate space for equipment
- Contract with BCHydro or TELUS to use their aerial support structure
- Application of proposed fibre placement to selected utility
- Fibre build from Base location to Connected Coast Landing Site
- Placement of main fibre, fibre drops, splicing and activation to the customers
- Service contract with Connected Coast provider



Estimated cost range - \$1,607,225 - \$1,746,170 / \$4,477 - \$4,864/ per address

Costing does not include any costs for a building to house central equipment

(The biggest variable in cost comes from Make-Ready (See page 6) & amount of conduit build required.



<p>PREPARED BY DRIFTWOOD COMMUNICATIONS LTD. 8880 VICTORIA ROAD VANCOUVER, BC V6M 3M8</p> <p>DRAWN BY: CHERYL SAELE</p> <p>CHECKED BY: CAS</p> <p>PLOT DATE: 02-FEB-2021</p>	<p>LEGEND</p> <p>— Support Structure Route</p> <p>● Address location</p>	<p> qathet REGIONAL DISTRICT</p> <p><small>PROPRIETARY INFORMATION THIS INFORMATION IS UNCLASSIFIED ON THE DOCUMENT BUT IS NOT TO BE REPRODUCED OR DISCLOSED WITHOUT THE WRITTEN PERMISSION OF THE REGIONAL DISTRICT</small></p>	<p>LUND</p> <p>ADDRESS COUNT: 359</p> <p>DRIFTWOOD PROJECT # 20202005</p> <p>SCALE: N/A</p> <p>SHEET SIZE: B</p>	<p>ESTIMATED ROUTE METERS 27,789m</p> <p>TITLE: ROUTE METERS</p> <p>LOCATION: LUND</p> <p>SHEET NO. 1 OF 93</p>
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Current known services available in the Texada Island area include:

- Raincoast Wi-Fi
- Cellular Services
- TwinComm Wi-Fi / LTE
- Xplornet Satellite
- Gillies Bay Internet Society (GBIS)
- Texada Community Television Association (TCTA)

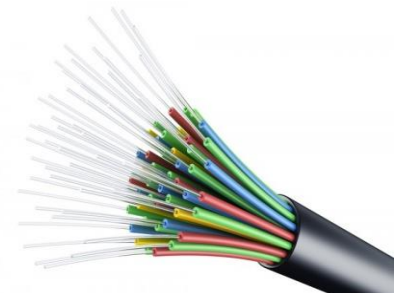
The following are some of the options available for the Texada Island areas shown on the following maps.

- Gillies Bay Internet Society could upgrade the existing cable system making it capable of offering DOCSIS 3.0 Internet services to all residents located within the cable system area.
- Existing providers Gillies Bay Internet Society & Texada Community Television Association could extend their service to those areas presently un-serviced. This could be done with FTTH extensions.
- An existing or new ISP could construct a new FTTH Network for the entire island.

There are two proposed landing sites for the Connected Coast Project with a switch offering Multi Gb service which will open the opportunity for an existing or new provider to connect and deliver broadband Internet services to the areas approximate 776 addresses. One located in Gillies Bay and one by Van Anda.

ENTIRE ISLAND NEW FTTH – Requirements for this method would include the following elements:

- Network design
- Secure a structure with power and adequate space for equipment
- Contract with BCHydro or TELUS to use their aerial support structure
- Application of proposed fibre placement to selected utility
- Fibre build from Base location to Connected Coast Landing Site
- Placement of main fibre, fibre drops, splicing and activation to the customers
- Service contract with Connected Coast provider



Approximate Network Route Meters = 33 Km

Estimated cost range - \$2,696,119 - \$2,896,119 / \$3,474 - \$3,732 / per address (776)

HYBRID SOLUTION – UPGRADE AND EXTEND

Leverage the existing cable systems infrastructure with upgrades to increase capacity adding DOCSIS 3.0

Gillies Bay and Van Anda Cable systems upgrade cost Estimate - \$500,000

GBIS Extends existing service outlying areas South East and North

South East Estimated cost range - \$715,676 - \$806,036 / \$9,542 - \$10,747 / per address (75)

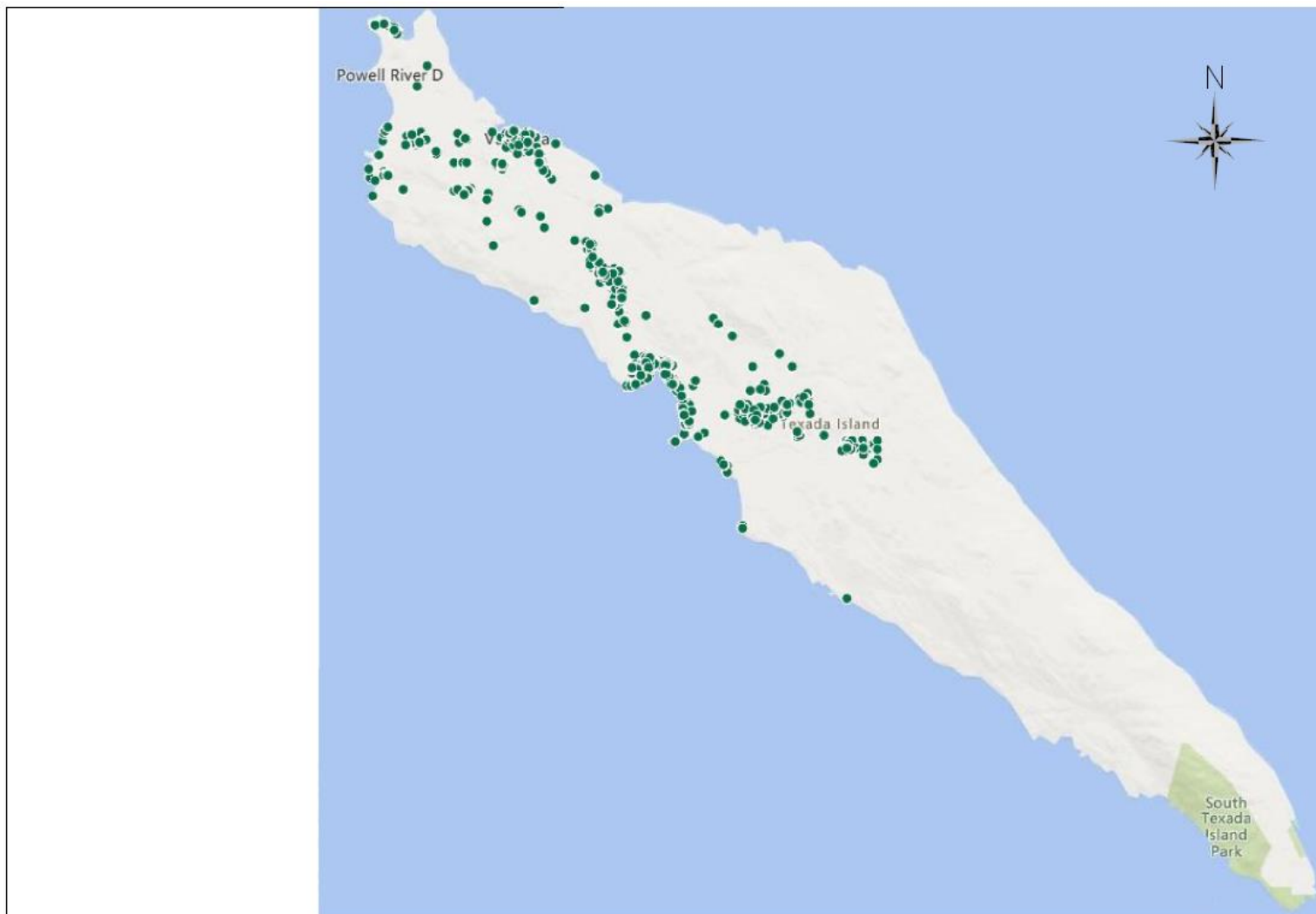
North Estimated cost range - \$406,098 - \$455,488 / \$7,252 - \$8,134 / per address (56)

TCTA Extends existing service outlying areas South East and North



West of Van Anda Estimated cost range - \$365,106 - \$410,771 / \$11,064 - \$12,448 / per address (33)

(The biggest variable in cost comes from Make-Ready. See page 6)

Some addresses may require alternate service solutions due to extreme costs to service within above concepts



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	DRIFTWOOD COMMUNICATIONS LTD.
	1000 17TH AVENUE ROAD
	VANCOUVER, BC V6M 3S8
DRAWN BY: CHERYL SAELE	
CHECKED BY: CAS	
PLOT DATE: 02-FEB-2021	

LEGEND	
	Support Structure Route
	Address location



qathet

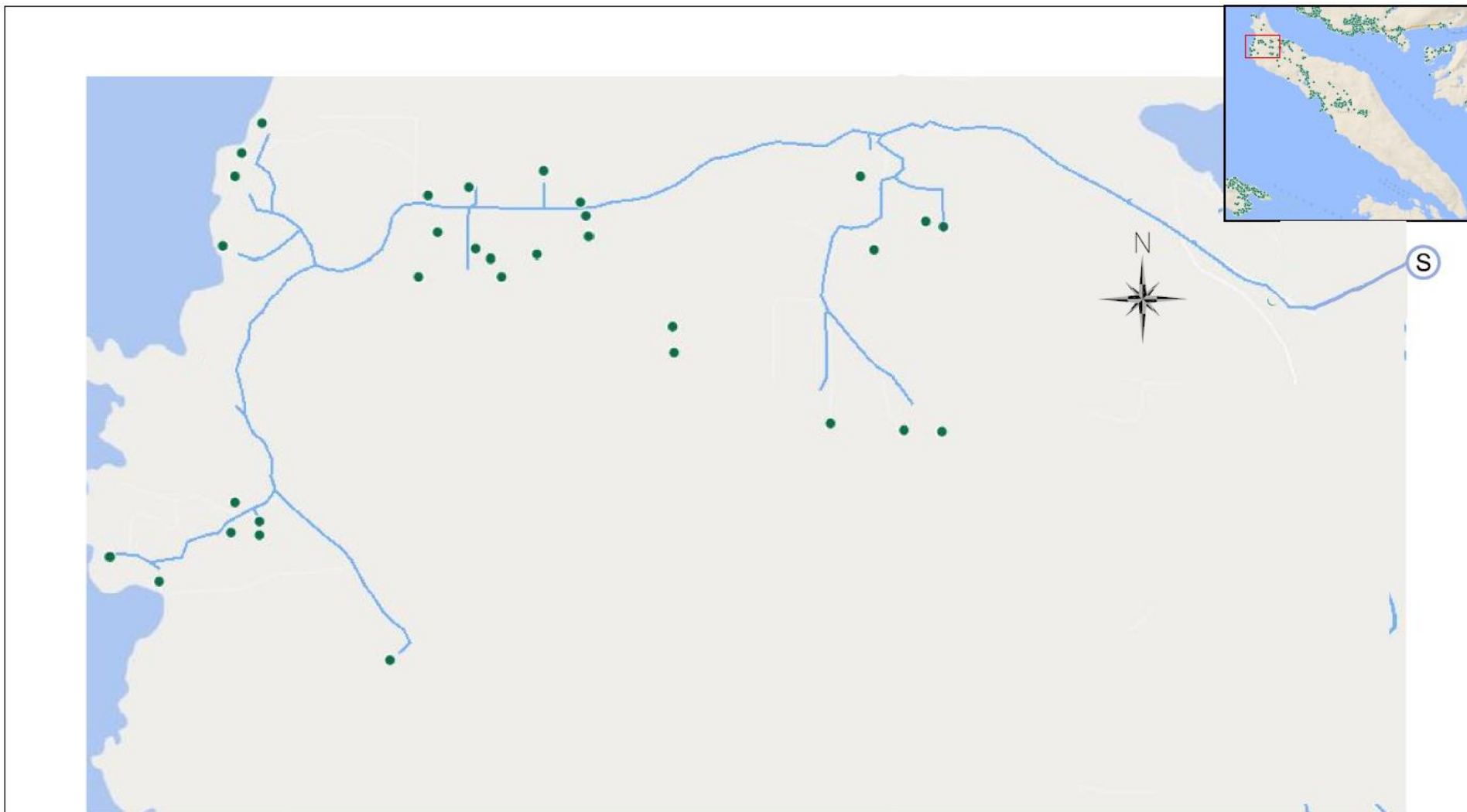
REGIONAL DISTRICT

PROPRIETARY INFORMATION

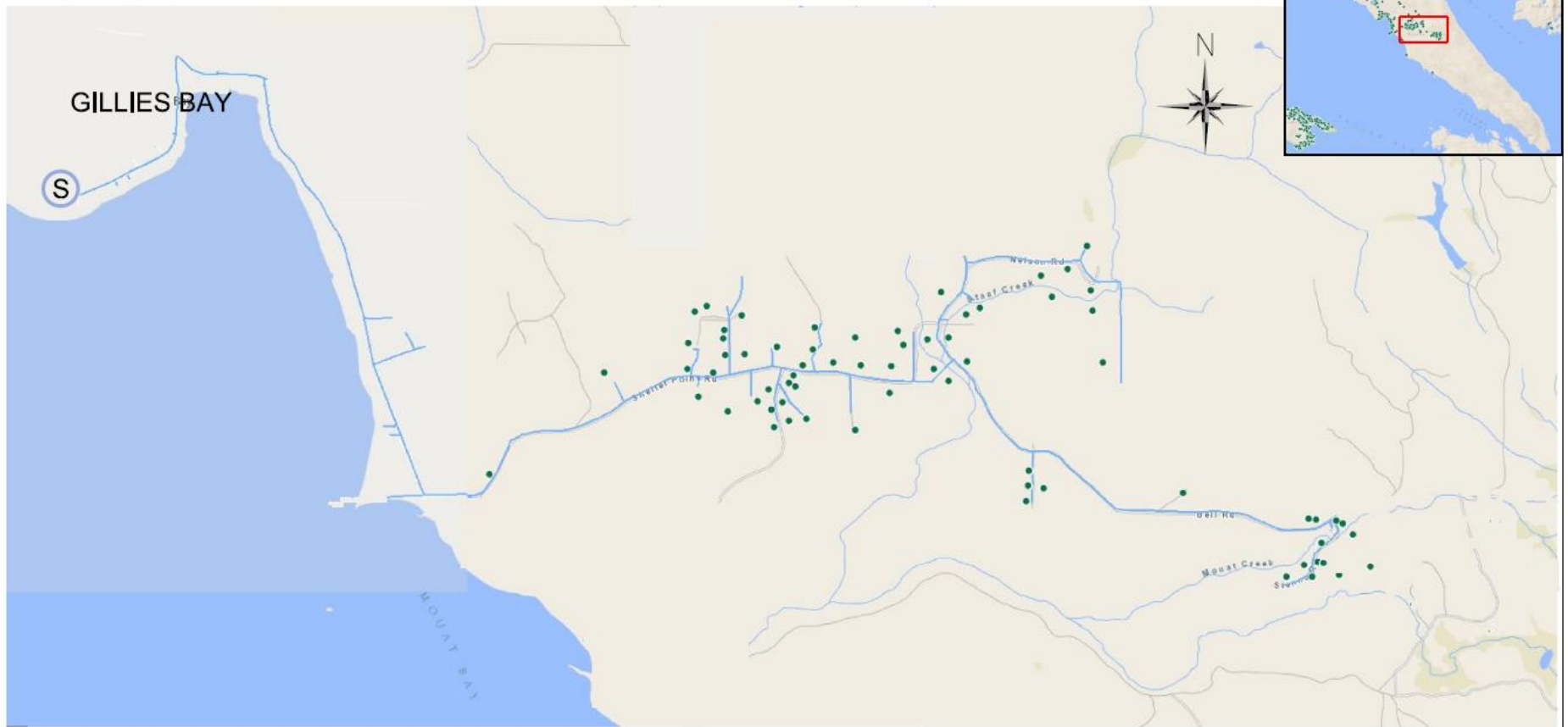
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TEXADA ISLAND	
ADDRESS COUNT: 776	DRIFTWOOD PROJECT #: 20202005
SCALE: N/A	SHEET SIZE: B

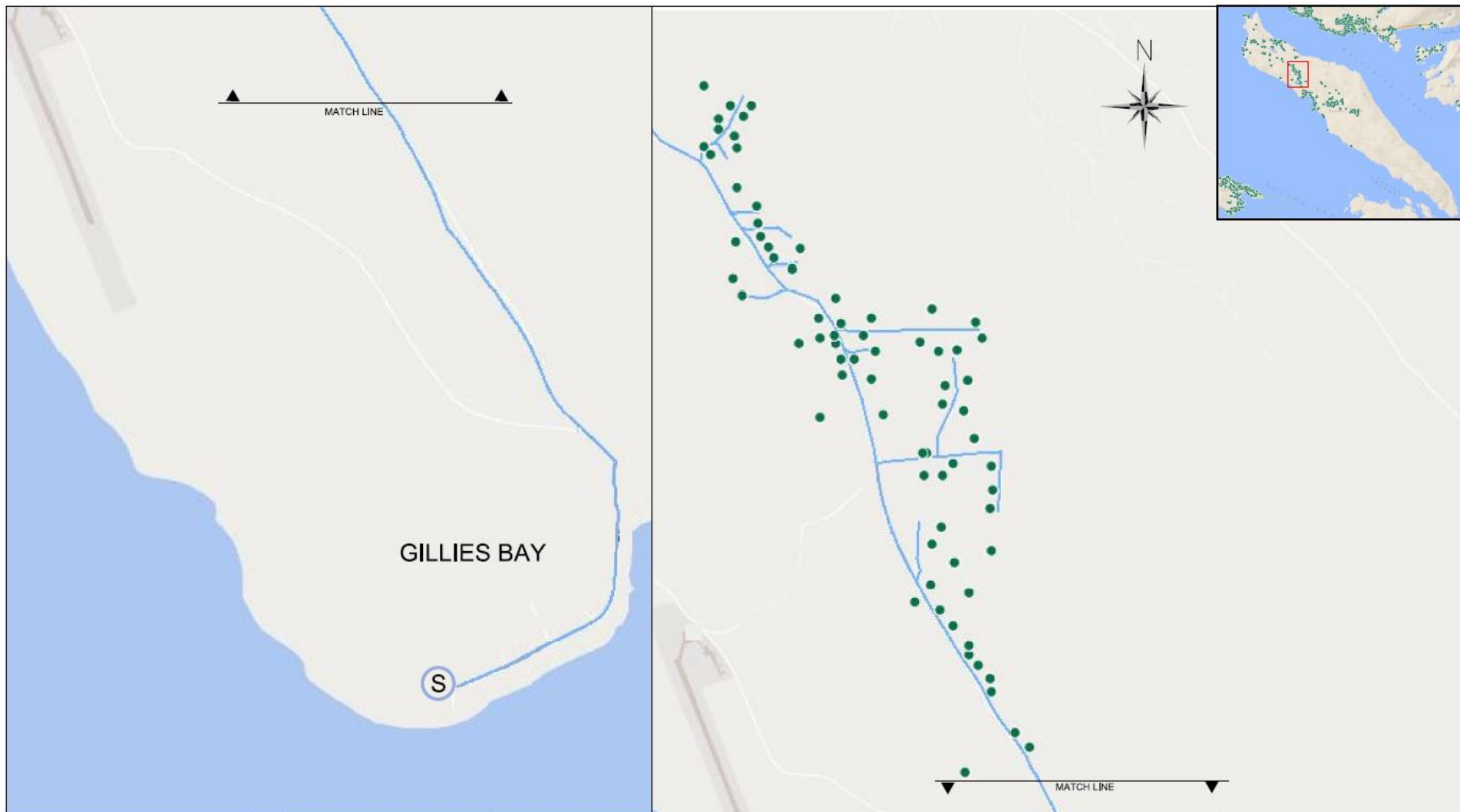
ESTIMATED ROUTE METERS	
33,459m	
TITLE:	ROUTE METERS
LOCATION:	SALTREY BAY
SHEET NO.	1 OF 1



<div></div> <div>PREPARED BY: DRIFTWOOD COMMUNICATIONS LTD. 8881 VETTER ROAD, VANCOUVER, BC V6M 3M6</div>	LEGEND		<div></div> <div>qathet REGIONAL DISTRICT</div> <div>PROPRIETARY INFORMATION THIS DOCUMENT IS UNCLASSIFIED BY THE DISSEMINATION GROUP ON 20200505. IT IS NOT TO BE RELEASED OR DISSEMINATED WITHOUT THE AUTHORITY OF THE DISSEMINATION GROUP.</div>	WEST VAN ANDA			ESTIMATED ROUTE METERS: 9,133m		SHEET NO. 1 OF 1 Page 81 of 93
	<div></div> Support Structure Route	<div></div> Address location					TITLE: ROUTE METERS		
	DRAWN BY: CHERYL SAELE				ADDRESS COUNT: 33		LOCATION: WEST OF VAN ANDA		
	DESIGNED BY: NAME				DRIFTWOOD PROJECT # 20202005				
	CHECKED BY: CAS				SCALE: N/A				
PLOT DATE: 02-FEB-2021			SHEET SIZE: B						



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	<div><div>ADDRESS COUNT: 56</div><div>DRIFTWOOD PROJECT # 20202005</div><div>SCALE: N/A</div><div>SHEET SIZE: B</div></div>		<div><div>TITLE: ROUTE METERS</div><div>LOCATION: SOUTHWEST GILLIES BAY</div></div>		SHEET NO 1 OF 93	



<div><div>PREPARED BY DRIFTWOOD COMMUNICATIONS LTD. 6905 VICTORIA ROAD WILLOWDALE, ONT. M2H 3M4</div></div> <div>DRAWN BY: CHERYL SAELE</div> <div>CHECKED BY: CAS</div> <div>PLOT DATE: 02-FEB-2021</div>	<div>LEGEND</div> <div><div><div></div>Support Structure Route</div><div><div></div>Address location</div></div>	<div><div><div>qathet REGIONAL DISTRICT</div><div>PROPRIETARY INFORMATION THIS INFORMATION IS PROPRIETARY TO DRIFTWOOD COMMUNICATIONS LTD. AND IS NOT TO BE REPRODUCED WITHOUT WRITTEN CONSENT</div></div></div>	NORTH GILLIES BAY		ESTIMATED ROUTE METERS 9,878m	
	ADDRESS COUNT: 75		TITLE:	SHEET NO. 1 OF 1		
	DRIFTWOOD PROJECT # 20202005		ROUTE METERS			
	SCALE: N/A		LOCATION:			
	SHEET SIZE: B		NORTH GILLIES BAY			

Current known services available in the Savary Island area include:

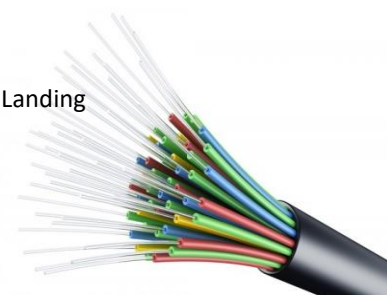
- Raincoast Wi-Fi
- Cellular Service Providers
- TwinComm Wi-Fi / LTE
- Xplornet Satellite

1. Existing providers Raincoast and TwinComm continue to improve their coverage and service offerings.
2. An existing or new ISP could construct a new FTTH Network for the entire island.

The advantage of a FTTH network is that it is passive. The only requirements for electricity are the electronics at the start of the network and the customer equipment in the residence. The customer equipment ONT has a very low power requirement (Typically under 10 watts) that could be met with minimal solar or wind power for example.

ENTIRE ISLAND NEW FTTH – Requirements for this method would include the following elements:

- Network design
- Secure a structure with power and adequate space for equipment
- Application of proposed Conduit system placement and construction
- Submarine fibre placement from mainland to the Island or new Connected Coast Landing on Savary Island
- Placement of main fibre, fibre drops, splicing and activation to the customers
- Service contract with Connected Coast provider



Approximate Network Route Meters = 11 Km

There are several challenges to construct a solution with a FTTH product:

- As there are no pole lines on Savary Island all construction would have to be achieved with underground placement. This significantly drives up costs.
- There are 1700⁶ lots on Savary Island¹⁵ and a network would need to be designed to provide for service to all lots to be futureproof.
- No power service is available on Savary Island to support the central distribution point equipment. If the central distribution point were on the mainland, Lund for example with a submarine fibre to Savary, a passive optical network would be viable assuming that each user could power their individual ONT unit.
- Savary Island is not included in the current Connected Coast submarine fibre plan. It is ~4 Km to the nearest planned site in Lund. A submarine fibre build from Lund to Savary would be necessary unless the proposed Connected Coast plan was amended to include a landing location on Savary

Estimated cost range - \$2,943,000- \$3,576,251 / \$2,110- \$2510 per lot (1700)



\$3,788- \$4,603 per developed lot (777)

\$34,958 - \$43,499 per permanent resident (70)

As Savary Island is predominantly comprised of recreational properties with ~70⁶ permanent residents, the most viable solutions for Savary Island would continue to be wireless services such as Cellular 5G, LTE, Wi-Fi and Satellite. The development of new technologies and services such as TwinComms LTE network and Starlink for those requiring greater speeds or being in locations where existing wireless services are either unavailable or poor quality.

¹⁵ Savary Island Official Community Plan Feb 22, 2007



 <p>PREPARED BY: DRIFTWOOD COMMUNICATIONS LTD. 8888 VETTER ROAD, VANCOUVER, BC, V6N 3M4</p>	<p>LEGEND</p> <p>— Support Structure Route</p> <p>● Address location</p>	 <p>qathet REGIONAL DISTRICT</p> <p><small>PROPRIETARY INFORMATION THIS INFORMATION IS DEVELOPED ON THE ASSUMPTION THAT THE DATA IS ACCURATE AND COMPLETE. THE USER SHALL BE RESPONSIBLE FOR VERIFYING THE DATA AND ITS ACCURACY.</small></p>	SAVARY ISLAND		ESTIMATED ROUTE METERS 11,045m	
			ADDRESS COUNT: 777		TITLE: ROUTE METERS	
			DRIFTWOOD PROJECT # 20202005		LOCATION: SAVARY ISLAND	
			SCALE: N/A		SHEET SIZE: B	

Current known services available in the Bliss Landing area include:

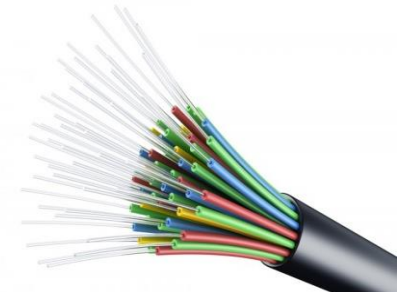
- TwinComm Wi-Fi
- Cellular Service Providers
- Xplornet Satellite

An existing or new ISP could construct a new FTTH Network for the area.

The proposed landing site for the Connected Coast Project with a switch offering Multi Gb service which will open the opportunity for an existing or new provider to connect and deliver broadband Internet services to the areas approximate 28 addresses.

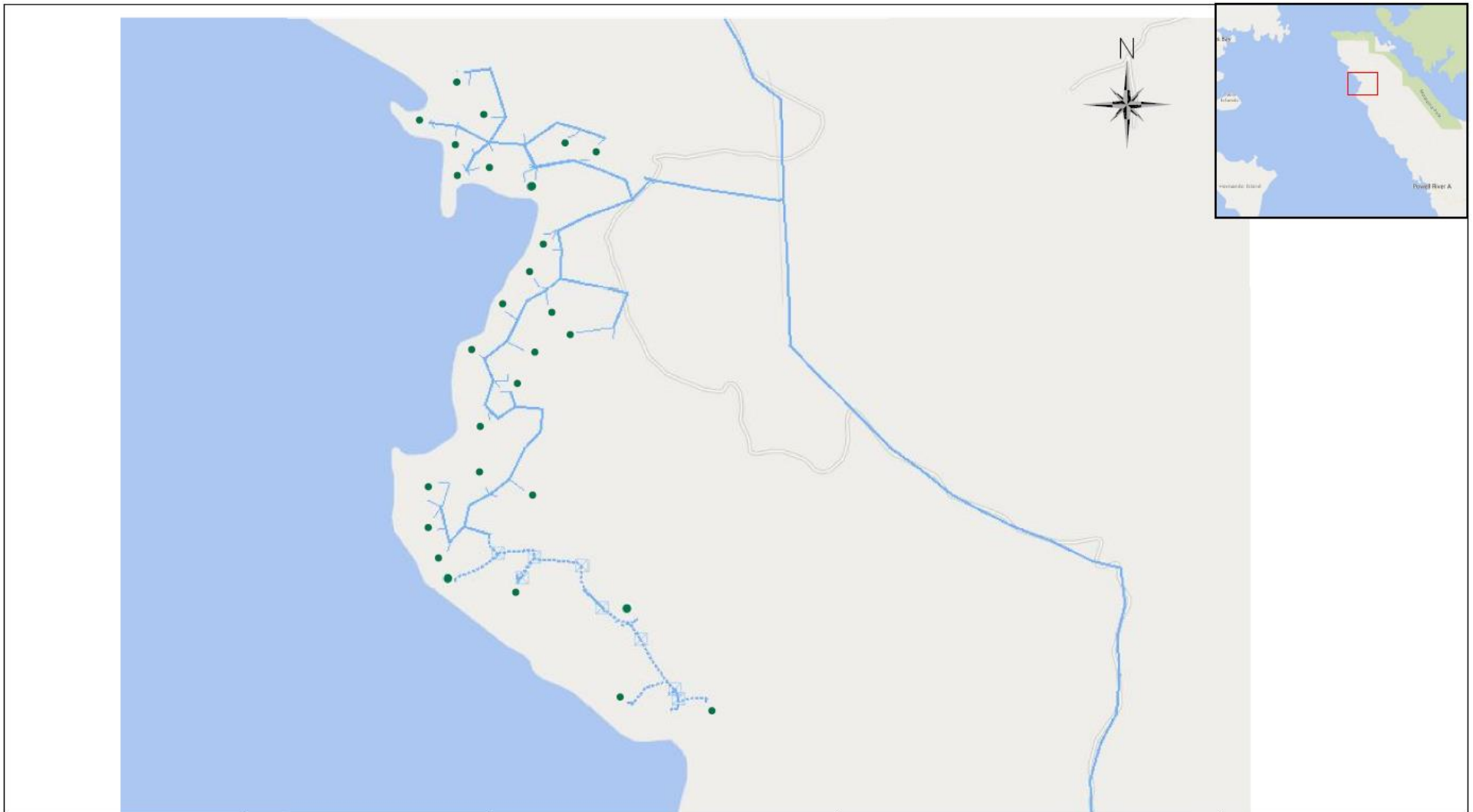
NEW FTTH – Requirements for this method would include the following elements:

- Network design
- Secure a structure with power and adequate space for equipment
- Contract with BCHydro or TELUS to use their aerial support structure
- Application of proposed fibre placement to selected utility
- Fibre build from Base location to Connected Coast Landing Site
- Placement of main fibre, fibre drops, splicing and activation to the customers
- Service contract with Connected Coast provider



Approximate Network Route Meters = 4.097 Km

Estimated cost range - \$167,570 - \$188,055 / \$5,985 - \$6,716 / per address (28)



<div><p>PREPARED BY DRIFTWOOD COMMUNICATIONS LTD. 8800 VENTURE ROAD VANCOUVER, BC V6N 1A6</p></div>	LEGEND		<div><p>qathet REGIONAL DISTRICT</p><p><small>PROPRIETARY INFORMATION THIS INFORMATION IS FOR USE ONLY ON THE DOCUMENT IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM.</small></p></div>	BLISS LANDING		ESTIMATED ROUTE METERS 4,097m	
	<div><div>— Support Structure Route</div><div>● Address location</div></div>			ADDRESS COUNT: 28	TITLE:	SHEET NO. 1 OF 1	
				DRIFTWOOD PROJECT # 20202005	ROUTE METERS		
				SCALE: N/A	LOCATION:		
				SHEET SIZE: B	BLISS LANDING		
DRAWN BY: CHERYL SAELE							
CHECKED BY: CAS							
PLOT DATE: 02-FEB-2021							

BUSINESS CASE

As is clearly shown within this report and other similar reports, the cost to build broadband Internet services to those areas presently without service can be very expensive. With costs per home exceeding thousands of dollars it is hard to realize any business case that could be viable. However, with the increased focus of all levels of government toward creating universal access to broadband Internet for all Canadians, and with significant grant funding support, the business cases that were once considered cost prohibitive have moved back into the realm of viability.

It is an extremely exciting time for the telecommunications industry in Canada. The global impact of the Covid-19 pandemic has underlined the critical need for unrestricted Internet access and has prompted massive governmental funding programs to meet this need. In short, telecommunications endeavors have never been more well-funded.

Still, the most viable technology to support a feasible business plan on a capital cost basis are terrestrial fixed wireless services such as Wi-Fi or LTE. However, with the launching of LEO satellite constellations like Starlink, higher levels of service will eventually become fully licensed and available.

GRANT FUNDING & SUPPORT OPPORTUNITIES

There are several key broadband funding channels available for Regional Districts, Communities and Private Enterprises in British Columbia including:

UNIVERSAL BROADBAND FUND: \$1.75 BILLION IN FUNDING OVER 7 YEARS

- Includes \$750M for large impact projects
- \$50M for mobile Internet projects for Indigenous communities
- \$150M Rapid Response Stream for projects that can be started and completed quickly (current phase now closed)

CANADA INFRASTRUCTURE BANK

The CIB and Innovation, Science and Economic Development Canada (ISED) have agreed to collaborate to encourage and jointly assess and enable large broadband projects within ISED's Universal Broadband Fund.

As the CIB works with ISED to promote the development and funding of large broadband projects, we expect large ISPs to bring forward large broadband projects across Canada, and small to medium sized ISPs to do the same in regions where smaller projects could have a material impact on communities.

The CIB will provide significant capital across senior debt, subordinated debt, or equity investments. These investments will be made alongside contributions from ISED (and potentially provincial programs) and private capital from ISPs and private investors to connect hundreds of thousands of households across Canada to broadband Internet.

NORTHERN DEVELOPMENT "CONNECTING BRITISH COLUMBIA" PROGRAM

- Multiple funding channels including latest Phase 3 Transport and Last Mile scopes closed March 15, 2021
- Northern Development Economic Recovery Intake: \$90 Million for infrastructure than needs to be allocated by March 2021 and project competition by October 31, 2021
- Regional Connectivity Plan Funding also available to help cover the impactful expenses of developing, designing and budgeting for new regional broadband projects
- Program founded on the principle that the best decisions for the North should be made in the North

- Provides network upgrade funding to 203 First Nations communities
- No application required but lands must be part of the current list of approved communities
- Level of funding unknown

CRTC BROADBAND FUND

- \$750M over 5 years
- Second call for applications now closed with date for third call TBD

MUNICIPALITIES GAS TAX FUND

- \$3 Billion over 10 years for infrastructure projects

INFRASTRUCTURE CANADA FUNDING FOR RURAL AND NORTHERN BC COMMUNITIES – FEDERAL GAS TAX FUND

- 2 billion a year allocated nationally to infrastructure projects including broadband and connectivity
- Serves over 3600 communities

CANADIAN INTERNET REGISTRATION AUTHORITY

- Grants of \$100K available to small group of applicant types including non-profit organizations
- Call for applications start March 2, 2021

COASTAL COMMUNITY CREDIT UNION (BUILDING HEALTHIER COMMUNITIES FUND)

- Programs implemented by community organizations
- Financial education programs
- Economic development initiatives
- Island-based programs or initiatives
- Initiatives that support more than one person

BC MINISTRY OF CITIZENS' SERVICES – CONNECTED COMMUNITIES

Connected Communities is a new initiative for the Ministry of Citizens' Services to support the digital readiness of local governments, First Nations, and rural communities. The Connecting British Columbia program has set aside funding to assist regional districts and local governments with grants up to \$15,000 to undertake connectivity planning for their area to determine the gap areas and priorities for connectivity.

One very important item to note, is that there are grant funds available to research a proposed solution to determine feasibility and costs. If the results are positive, a grant application to complete the project may be submitted.

qRD BECOMES AN ISP

The qRD is presently very healthy when it comes to the number of existing ISPs in the entire region and as such, we do not believe there is any benefit for them to become another ISP. For the qRD to become its own ISP, they would need to provide a benefit that the existing ISPs are unable to provide and would need to demonstrate an advantage. It is our opinion that there are not any advantages available that the existing ISPs do not already have. In addition, the qRD would be faced with start-up costs not required for those already established.

qRD BECOMES AN ISP THROUGH A PARTNERSHIP

The qRD could consider invoking Section 275 of the Local Government Act to provide assistance for project(s) that meet the qRD's desired goals. "Assistance" can be defined as a "Grant".

The Connected Coast project is moving forward and includes 15 landing sites in the qRD. Some of these sites are key locations for the future service delivery to areas that are presently among those facing challenges.

The qRD could explore and consider what opportunities exist to promote, support, and potentially partner with the Connected Coast Project.

qRD AS A FACILITATOR

We believe that this is the single, biggest opportunity for the qRD to leverage its position and resources for the benefit of the community.

To that end, we have outlined potential opportunities in the following short, medium, and long-term goals.

The qRD has several service providers who possess a multitude of deployed technologies including: Fibre to the Home, Hybrid Fibre Coax, LTE Internet Network, Wi-Fi, Cellular mobile and fixed, and most recently, the launching of a new LEO satellite constellation. Our report has included OneWeb, Starlink and Telesat. Starlink has services for customers currently in beta testing. However, there are additional entities that are pursuing the launch of their own LEO Internet service constellations to provide Internet services to the world.

- Amazon - In 2019 Amazon filed an application for a 3,236-satellite constellation of low-earth orbit Internet service satellites titled Project Kuiper.
- China's global Digital Silk Road - In 2020 applied for spectrum for a 12,992-satellite constellation.

The future goal of providing everyone in the qRD with a minimum of 50/10 Internet service is close to becoming a reality. This is possible today if a user is willing and able to sign up with Starlink as a beta tester, and providing they are in a location that provides adequate satellite viewing.

SHORT TERM OPPORTUNITIES

1. Continue providing important letters of support for grant applications that are consistent with the qRD's objectives for Internet service availability. It is worth noting that there are grants available to support the need for Cellular service in areas presently lacking coverage. The qRD can assist these applications as well with letters of support.
2. There could be existing ISPs who are not fully aware of the number or location of those who want service. The qRD could develop a protocol to collect this information and present it to existing ISP's.

For Example: There could be several cases where customers located at the edge of existing service areas, may have individually contacted ISP(s) and because they are viewed as such and not a larger group, their requests may have been denied. It is conceivable residents who live in separate geographical areas could construct a viable business case for numerous smaller extensions; in effect, acting as a *Group* rather than *Individuals*. Leveraging the qRD's community connection, the qRD could play a valuable role in facilitating ISP awareness of new business opportunities.

Information collected could include resident or business name, service address and desired service level.

3. qRD Board Members noted that there are schools that currently lack adequate Internet service and that there are qRD Directors and Staff who were unable to effectively work from home due to their remote location. By installing Starlink Systems as an interim solution, the qRD could effectively address and resolve these critical issues. Providing each location meets the viewing requirements.
4. Provide support and encouragement for grant applications that seek to access possible solutions that could add or improve both Internet and Cellular services to a given area. One example opportunity would be Lasqueti Island's connection of their network to the Connected Coast fibre landing location. Grants are available to determine the best solution design along with the associated costs. This information can then be submitted for a further grant application to complete the project.

MEDIUM TERM OPPORTUNITIES

1. Continue to provide the above short-term support, as necessary.
2. With the inevitable increase in Internet availability and usage, comes the need to increase local skilled resources to support these networks and users. The qRD could play a pivotal role in supporting local, educational opportunities in the tech industry by exploring what currently exists and where new opportunities could be developed.

While we are confident that support from available grants and new technologies will provide residents and businesses in the qRD with access to a minimum service level of the 50/10 objective, there will continue to be challenges in two remaining categories:

1. **Affordability**

There will continue to be qRD citizens who simply cannot afford Internet service. Perhaps they cannot afford the minimum level of service, buy a computer, or they require a higher level of service that exceeds their financial reach.

However, a positive development is that *Innovation, Science and Economic Development Canada* launched a program called “Connecting Families”, which provides Internet access to lower income Canadians in the form of reduced rates for lower-level service.

Despite the importance of high-speed Internet, almost half of Canadian households with an annual income of \$30,000 or less do not have access to this vital service. The Connecting Families initiative brings together public, private, and non-profit sectors to ensure that more Canadian families have access to the Internet.¹⁶

To support regional low-income families, the qRD could examine opportunities for the development of supporting programs in those areas:

- Additional top-up subsidies for youth education that require greater speeds than currently supported
- Local recycling initiatives to put refurbished computers/tablets into the hands of those in need

2. **Service Level disparity**

Achieving a minimum of 50/10 service availability to all qRD addresses will be a monumental milestone, but it still will not fully meet the needs of everyone. Many Canadians require service levels far beyond these speeds and currently this can only be achieved by terrestrial-based fibre and HFC networks.

To address this and to promote new business opportunities, the qRD could provide an additional important service by collecting and sharing details of homes & businesses who require higher levels of service (than what is currently available), and then share this information with all ISPs.

¹⁶ <https://www.ic.gc.ca/eic/site/111.nsf/eng/home>

CONCLUSIONS

The qathet Regional District is absolutely bubbling with Internet and cellular improvements and expansion activities from multiple service providers. The qRD board has provided letters of support for important projects, which is a necessary requirement for many grant applications.

Active service improvement activities:

- Twincomm's construction of an LTE fixed wireless system serving Lund and Savary Island areas
- TELUS' installation of additional cellular towers improving cellular connectivity along Hwy 101 and opening the ability to offer fixed wireless Internet services and well as mobile
- Rogers' deployment of 5G services with coverage over many areas of the qRD
- Gillies Bay Internet Societies upgrade of the existing cable system to offer DOCSIS Internet
- The Connected Coast Project moving into the Network Design and Construction phase
- StarLink offering service as a beta tester with download speeds of 50Mbps to 150Mbps

The launch of the Starlink LEO constellation is very positive news for rural and remote locations as it gives their Internet users the choice to access higher levels of service. Because this is a new technology currently in Beta trials, it is important to note that it is not yet fully licensed to offer services in Canada. In addition, like other satellite systems, the user must have a certain level of viewing field for the system to work but fortunately, Starlink has apps that can be installed on your phone to test this at any given location.

Numerous grant opportunities are available to support projects that will deliver Internet services to those who currently fall short of the minimum acceptable levels.

In fact, existing local service providers have been approved for supportive grant funds, making the business case for expansion or upgrades more viable. Indeed, there are many additional areas in the region that could also generate viable grant applications, so we anticipate this trend continuing forward in the region.

At this point in time, the Connected Coast project has moved into the Design & Construction phase.

This project will generate significant Internet connection points throughout the qRD and opens the door for existing and new service providers to connect and distribute high speed Internet to currently underserved areas.

In addition, for areas like Gillies Bay and Van Anda, the challenge for existing providers is that they are unable to obtain a large enough Internet connection to support the capacity required for high-speed services.

Driftwood has been in the telecommunications industry for over 25 years, and we have never seen this much focused activity to get Internet & Cellular services to all Canadians as we have in the past 1 to 2 years.

From our perspective, this is both an exciting and positive sign for folks living in any region of the qRD.