

Community Connectivity Plan: Ditidaht First Nation



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1. SITUATIONAL OVERVIEW

The Cowichan Valley Regional District (CVRD) has undertaken the development of a connectivity strategy, to address the objectives of extending at least 50 Mbps down/10 Mbps up broadband service to all underserved areas, and to extend cellular coverage along roadways and to premises within those underserved areas.

The strategy involves focusing on the extension of backbone fibre optic infrastructure, working with ISPs to improve their business cases to deliver last-mile infrastructure, interconnecting residential and business premises. To accomplish this, the CVRD will take on the role of connectivity advocate, engaging with service providers, utilities, communities, and senior governments to advocate for funding and encourage/assist with the prioritization of CVRD communities in comparison to others across the province for funding opportunities.

Within the context of the CVRD strategy, this community plan for Ditidaht First Nation provides specific tactics and information for the Nation, with the support of the CVRD, to advocate and in turn support ISPs with respect to the infrastructure that needs to be constructed under a focused plan to improve connectivity services to residents in the community.

2. COMMUNITY OVERVIEW

The Ditidaht People have inhabited the land around Nitinaht Lake on the west coast of Vancouver Island since time immemorial. Their traditional territory stretches from mid island to include Cowichan Lake and Nitinaht Lake. It extends into the Pacific Rim National Park Reserve between Bonilla Point and Pachena Point.

The present-day Ditidaht First Nation population resides on a total of 750.7 hectares of land, composed of 17 reserves across western Vancouver Island. The most populated reserve is Malachan 11, a remote community on the east side of the upper end of Nitinaht Lake, close to the Caycuse River mouth. Of the 775 registered Ditidaht members, 168 live on the Malachan Reserve.¹ The reserve is located approximately 46 km from Youbou, and accessible only by unpaved active logging roads. Residents, including elders, face unsafe road conditions and weather-related road closures that sometimes result in the community being cut off from key services and supplies.

The median age of Malachan residents is 29.2, considerably lower than the rest of Cowichan at 50.8. 66.7% of the population is between the age of 15 and 64. The median household income was \$26,880 in 2015, compared to \$65,191 for Cowichan.² Census 2021 income data is not available for Malachan. Since most housing is owned by the Nation, the median monthly shelter cost paid by individuals was

¹ "First Nation Profiles: Ditidaht", Crown-Indigenous Relations and Northern Affairs Canada, October 2022, https://fnppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNMain.aspx?BAND_NUMBER=662&lang=eng

² "Census Profile, 2016 Census", Statistics Canada, June 18 2019, <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E>

\$282 in 2021. This includes utility costs, but not the cost of internet or cellphone plans. According to Census 2021, 13.3% of the Malachan workforce worked at home, and 46.7% had no fixed work address.³

Ditidaht Economic Development Corporation (DDC) was established in 2010 to generate revenue for the Nation, create employment opportunities for its members, and actively assert Ditidaht rights within Ditidaht territory. Close proximity to the West Coast Trail, Carmanah Walbran Provincial Park and Pacific Rim National Park Reserve, excellent sport fishing, and world-class windsurfing on Nitinaht Lake have made tourism the main economic activity for the Nation. DDC operates a number of tourism assets, including a visitor centre and general store, motel, and campground. Windsurfer Park recreation site and campground welcomes approximately 7,000 visitors each year and has been owned by the Nation since 2018. The Nation is a one fifth partner in St Jean's Cannery and Smokehouse, and the Raincoast Trading Company. They are also active in the forestry sector.⁴

3. CURRENT STATE OF CONNECTIVITY

The Regional Infrastructure and Service Availability Report identified that "ISED reports no physical facilities-based service, however, ICIS shows Telus infrastructure, but no indication of technology type. Reports from Connected Coast indicate that the infrastructure is comprised of fibre to the home or satellite services. Residents report that fibre infrastructure is served by radio link, which severely limits bandwidth." Due to a lack of address and other data, the report was unable to confirm or disprove ISED classifications for this area. Refer to Figure 1 below for additional information.

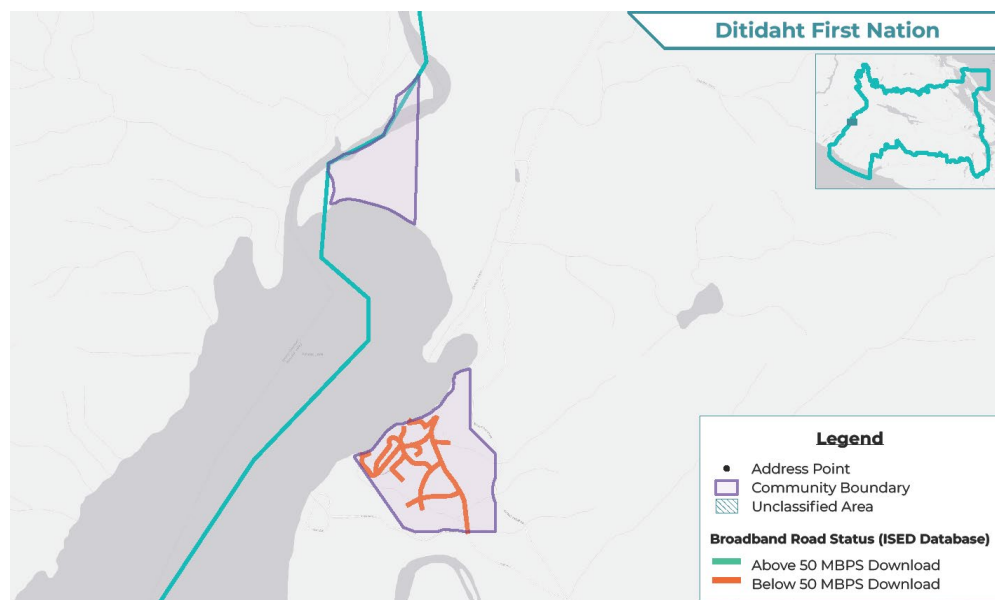


Figure 1: Ditidaht Nation Current State Broadband Coverage

³ "Census Profile, 2021 Census of Population", Statistics Canada, October 26 2022, <https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E>

⁴ "Ditidaht First Nation Economic Development Strategy", Ditidaht First Nation, November 2018, <https://nitinaht.com/wp-content/uploads/Ditidaht-EcDev-Strategy-COMplete-2019-03-08.pdf>

It is understood from discussions at the community engagement meeting that Conuma Cable has deployed fibre to the home infrastructure within the community, but that backhaul is through a restrictive Telus wireless link that results in severely limited speeds. It is also understood from that same meeting, that affordability of services is an issue within the remote community, and that competitive alternatives are restricted, as it is reported that Xplornet will no longer serve the area. It has also been communicated that a Connected Coast landing point for Ditidaht First Nation is proposed to be located within the community.

Additionally, it was noted that the construction standards, engineering and design of the existing fibre distribution infrastructure were such that it would not provide a sustainable service without risk of damage and/or regular outages.

4. WHAT WE HEARD

In September 2022, a community meeting was held to gather input from Ditidaht First Nation residents on their priorities and concerns. The meeting revealed that residents are connected to their ancestral lands but are isolated from society and feel that they are being left behind without connectivity.

Connectivity is important to the community businesses, enabling them to:

- leverage the full functionality of cash registers,
- update fuel pumps at the gas station,
- setup cameras at the dock with which to monitor weather conditions and provide security surveillance of boats and equipment,
- access health care,
- enable work from home, and
- enable remote learning and language practice.

The main concerns, or barriers to connectivity include:

- Redundancy and resilience,
- Community control of internet security and safety, and
- Community remote location and isolation.

Economic development activities in the community, including the construction of a large campground/park to support national and international visitors during Windfest (Canada's premier kiteboarding festival), also support the need for increased infrastructure development.

5. TECHNOLOGIES

Technology Options

	Digital Subscriber Loop (DSL)	Fibre to the Home (FTTH)	Cable (DOCSIS)	Fixed Wireless	Mobile Wireless (Cellular Data)	Satellite
Description	Digital data over telephone lines	Light transmission through glass fibres. Very low maintenance. Virtually unlimited future speeds	Electrical transmission over Cable TV system copper cables	2-way communication from fixed house antenna to tower	Internet delivered to a single mobile device	2-way communications from antenna to space and back
Challenges	Old technology Speed is distance-dependent from Telco Office	Fast, reliable, future-friendly	Ongoing maintenance of distributed batteries and active components	Susceptible to interference Line of sight to tower required	Prices moderate until data cap reached	Susceptible to interference Line of sight to satellite required
Typical Download	5-35Mbps	50Mbps-5Gbps	1.2Gbps	25-50Mbps	25-100Mbps	25Mbps GEO 50-250Mbps LEO
Typical Upload	0.5-5Mbps	50Mbps-5Gbps	200Mbps	5-10Mbps	0.5-5Mbps	1Mbps GEO 10-20Mbps LEO

Construction Methods

Construction Method	Advantages	Disadvantages
Aerial	<ul style="list-style-type: none"> • Less expensive to install • Readily available infrastructure (BC Hydro, Telus, community owned pole infrastructure) 	<ul style="list-style-type: none"> • Susceptible to wind and storm and traffic damage • Ongoing pole rental fees
Buried	<ul style="list-style-type: none"> • Less susceptible to damage • Low visual impact on environment 	<ul style="list-style-type: none"> • More expensive to install • Ongoing locate costs • Not appropriate for rocky terrains
Submarine	<ul style="list-style-type: none"> • Provides for connectivity across waterways 	<ul style="list-style-type: none"> • Very expensive
Wireless	<ul style="list-style-type: none"> • Lowest cost to serve an area • Serve multiple premises from a single tower site • Fewer locations required 	<ul style="list-style-type: none"> • Lack of community support • High visual impact on environment • Limited capacity and bandwidth • Ongoing land lease costs

Operating Model Options

Model	Advantages	Disadvantages
Community-Subsidized/ ISP-Owned	<ul style="list-style-type: none"> • Community influence on initial build technologies and configuration • Community can act as the customer to the ISP and distribute costs to the residents as it determines feasible to subsidize any affordability issues • No ongoing network operations or management required 	<ul style="list-style-type: none"> • Limited services based on one ISP • ISP controls assets
Community-Owned	<ul style="list-style-type: none"> • Full control of initial and ongoing technologies and configurations • Retail cost control to the community to manage affordability concerns • Open or closed network options 	<ul style="list-style-type: none"> • Responsible for network operations and maintenance

Model	Advantages	Disadvantages
Open Network	<ul style="list-style-type: none"> • All service providers can access all connected premises • Flexibility to attract new service providers for multiple service types (security, telehealth, education) • No high-cost infrastructure investments by service providers 	<ul style="list-style-type: none"> • Resistance in service provider community to deliver services over others' networks • Potential for finger-pointing on trouble resolution
Closed Network	<ul style="list-style-type: none"> • Single point of contact responsible for overall quality 	<ul style="list-style-type: none"> • Only one service provider has access to premises (service monopoly) • Potential for higher prices • Lower community input/involvement
Community-managed/Operated	<ul style="list-style-type: none"> • Full control of network technologies, configuration, and content • Lower variable operating costs 	<ul style="list-style-type: none"> • Must have available management skillsets and resources • Potential for higher cost of operations per home in smaller networks due to lower economies of scale • Potential for lower quality toolsets • Higher fixed operating costs
Outsourced management/operation	<ul style="list-style-type: none"> • Full control of network technologies, configuration, and content • Better economies of scale, due to operator's ability to leverage costs over multiple networks • Higher quality management toolsets • Lower operating capital 	<ul style="list-style-type: none"> • Higher variable operating costs due to "pay-per-use."

6. KEY CHALLENGES

- Lack of competition in the following areas:
 - High-capacity transport to/from the community, and
 - Fibre distribution networks.
- Broadband affordability

7. OPTIONS

This plan considers the options available within the context of the community's need for more bandwidth and reliable, affordable high-speed broadband service. The presence of Conuma Cable fibre to homes with limited Telus backhaul has tested the needs of the community and highlights how an improved offering is required. With the confirmation of a planned high-capacity Connected Coast landing site, there are two primary ways forward.

Option 1: Engage CityWest to build fibre-to-the-home from the Connected Coast landing site

Facilitate discussions between the Nation and CityWest for the construction of a new last mile fibre network from the Connected Coast landing site, along the roughly 4.5km of roads to the +/- 75 premises and businesses throughout the community and to the Nation's administrative offices, campgrounds, and all additional development sites into the future. Incorporating a "Dig Once" policy into all development projects within the Nation can add to the negotiation of rights of potential partnership or ownership stake in the network. Further connectivity access beyond the community to remote locations such as the IR 15 forestry business will likely need to remain serviced by satellite connectivity due to the cost of extending fibre over long distances.

The Nation may be able to negotiate control, or at least specify cyber security and end-user protections that could be included in the participating ISP's offerings. With the CVRD's support, the Nation can negotiate for an Open Access network to ensure that the community has the potential for competition of Service Providers to ensure that pricing stays competitive and affordable. An Open Access Network is one where there are a number of service providers which sell their retail services over the same network infrastructure, creating competition for the subscribers on the network.

Alternatively, the Nation could negotiate a single service plan where the Nation is the single customer to the Service Provider and then pass down costs to the residents and businesses at rates that are affordable and acceptable to its residents, to potentially manage affordability issues in the community.



Figure 2: Approximate 6km of Roads in the Ditidaht Nation Community and Adjacent Campgrounds

Option 1 Estimated Costs

Road Segments (including campgrounds) (m)	6,000
Premises (approximated from Google Earth)	75
Cost to Serve Underserved Road Segments	\$360,000
Cost to Connect underserved premises	\$75,000
Total Estimated Costs	\$435,000

Funding Opportunities	
Provincial and Federal Grants (70% construction costs to underserved premises)	\$304,500
Unfunded Remainder	\$130,500
Unfunded Remainder per Premise	\$1,740
Required Service Provider funding	\$1,740
Typical Service Provider Funding per premise for Fibre to the Home	\$2,500

As estimated construction costs of \$1,740 per home passed is lower than the typical service provider investment threshold of \$2,500 per home passed, it is expected that service providers would be

interested in participating in the project. Affordability of broadband services from ISPs may still need to be addressed.

If the Nation wants to provide fibre connectivity to service the IR 15 forestry business an additional estimated \$1,020,000 should be added to the capital budget for construction of aerial fibre to the site.

Option 2: Resolve Telus Backhaul and Conuma Cable Distribution Issues

Facilitate discussions with Telus and Nation staff to support resolving backhaul capacity, end-user speed issues and service level standards. One approach may be to have Telus lease circuits through the Connected Coast landing site, but it is unlikely that Telus would be interested in using other's infrastructure. Another approach would be for Telus to opt to construct new fibre infrastructure or enhance their microwave links. This option should also include effort with Conuma Cable to assess and address deficiencies of fibre to the home distribution infrastructure, which may involve complete replacement.

Option 2 Estimated Costs

Road Segments (m)	6,000	
Premises (approximated from Google Earth)	75	
Backbone Extension (m)	60,000	
Number of Towers (assumed existing link)	4	
	Extend Telus Fibre from Cowichan Lake or Mesachie Lake and Replace Conuma Cable Fibre Infrastructure	Enhance Telus Microwave and Replace Conuma Cable Fibre Infrastructure
Cost to Serve Underserved Road Segments	\$360,000	\$360,000
Cost to Connect underserved premises	\$75,000	\$75,000
Cost to resolve Telus backbone/backhaul	\$3,600,000	\$800,000
Total Estimated Costs	\$4,035,000	\$1,235,000

Funding Opportunities		
Provincial and Federal Grants (70% construction costs to underserved premises)	\$2,824,500	\$864,500
Unfunded Remainder	\$1,210,500	\$370,500
Unfunded Remainder per Premise	\$16,140	\$4,940
Typical Service Provider Funding per premise for Fibre to the Home	\$2,500	\$2,500
Total Service Provider Funding Required	\$187,500	\$187,500
Community Funding per premise	\$13,640	\$2,440
Total Community Funding Required	\$1,023,000	\$183,000
Total Funding (Grant + Service Provider + Community)	\$4,035,000	\$1,235,000

8. RECOMMENDATIONS

Based on costs to enhance backhaul and resolve existing fibre distribution issues, it is recommended that Ditidaht First Nation undertake Option 1, which involves engaging with CityWest to build new fibre to the home infrastructure extended from the proposed Connected Coast landing site. This would have the additional benefit of introducing competition to the community, improving resilience through service provider redundancy. The recommended strategies for this option are:

1) Observe, Advocate, and Influence

- i) Contact CityWest and/or other ISPs to offer support for applications for fibre to homes and campgrounds, connecting to the proposed Connected Coast landing in Ditidaht Nation,
 - ii) The Nation provide letters of support for all applicants that are following the CVRD plan requirements, if requested,
 - iii) Support all appropriate applications in public meetings or engagements, and
 - iv) Support economic development activities enhancing service delivery, such as supporting broadband connectivity to the Nation's campgrounds.
- b) Engage with Band Council and community to cooperatively work to help address affordability issues, including:
- i) Educating on Federal Government \$20/month broadband from Telus and others, as well as technology support programs for seniors, and
 - ii) Investigate opportunity for the Band to purchase Internet access in bulk, and provide as a utility to band-owned housing,
 - iii) Support the capacity of the Nation to plan and apply for funding and/or to provide free WiFi in public buildings to address affordability concerns.
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