



Community Connectivity Plan: Cowichan Station

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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 50Mbps down/10Mbps 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 prioritizing of CVRD communities in comparison to others across the province for funding opportunities.

Within the context of the CVRD strategy, this community plan for Cowichan Station provides specific tactics and information for the community, 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 service to residents in the community.

2. COMMUNITY OVERVIEW

Cowichan Station is a small rural community located just south of Duncan. It lies within the unceded territory of the Coast Salish people, who have stewarded the land since time immemorial. The land on which present-day Cowichan Station is located was pre-empted¹ from First Nations in the late 1800s by the Esquimalt and Nanaimo Railway.² The village built up around the local railway station. Today, this quiet agricultural centre is known as the gateway to the Kinsol Trestle and Bright Angel Regional Park, as well as for local farms such as Blue Grouse Winery and Cowichan Milk.³ Cowichan Station is a close-knit community with an active area association that operates the local community centre, and neighbour-to-neighbour Facebook group.

Cowichan Station includes portions of Cowichan Valley Electoral Areas B and E. Our analysis shows 635 premises in the study area. The median age of Area B is 44.4 and Area E is 46.0, both slightly lower than Cowichan overall at 50.8. 64.4% of the population is of working age (15 to 64), slightly higher than Cowichan overall at 58.1%. Given this, it is not surprising that incomes tend to be higher than the Cowichan average. The median household income of Area B is \$99,000, the highest of any Cowichan Electoral Area. Area E has a median household income of \$83,000, which is still higher than Cowichan overall at \$79,500. A higher proportion of the population in Areas B and E either work from home (B: 23%; E: 19.5%) or have no fixed work address (B: 21.9%; E: 21.9%) than Cowichan overall (17.8% and

¹ *Pre-emption was a method of acquiring provincial Crown land by claiming it for settlement and agricultural purposes.

² "First Nations History", Cowichan Station Area Association, <https://cowichanstation.org/first-nations-history/>

³ "Cowichan Station", Cowichan Station Area Association, <https://cowichanstation.org/cowichan-station/>

18% respectively). Over 80% of residents in these areas own their home, and the median value of dwellings is between \$650,000 and \$700,000, versus \$624,000 for Cowichan overall.⁴

3. CURRENT STATE OF CONNECTIVITY

Within Cowichan Station, the Regional Infrastructure and Service Availability Report found that although Telus and Shaw have some infrastructure present, 29% of premises (184 of 635), and 45.6% of road segments (33.4km of 73.2km) remain underserved. Figures 1 and 2, provide geographical context in terms of the broadband services and infrastructure gap in the community.

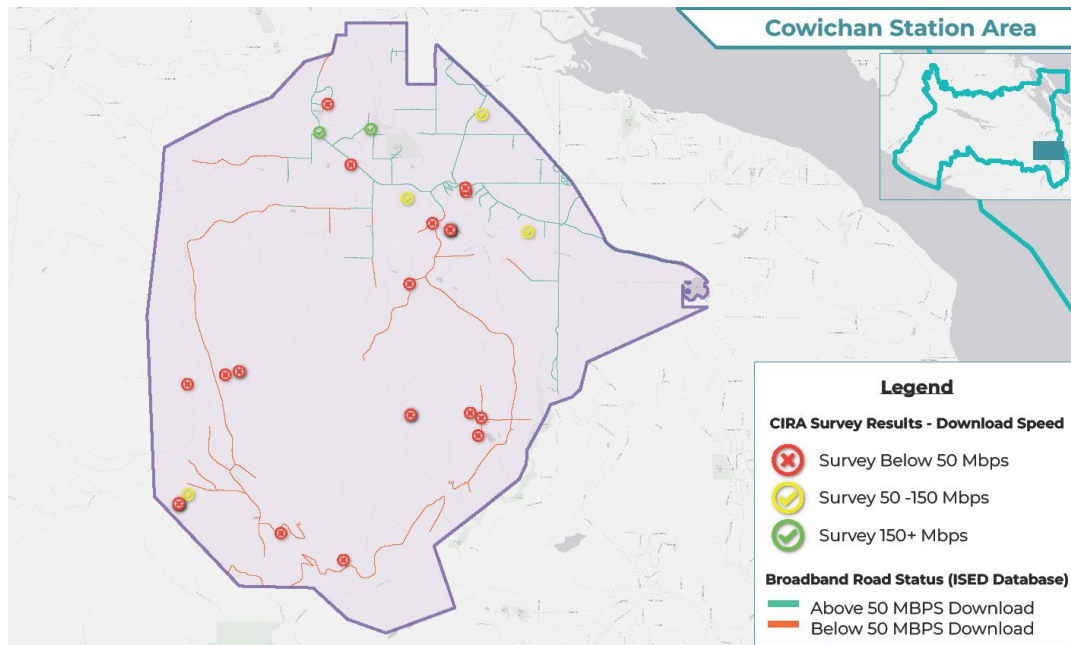


Figure 1: Cowichan Station Broadband Survey

⁴ "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>

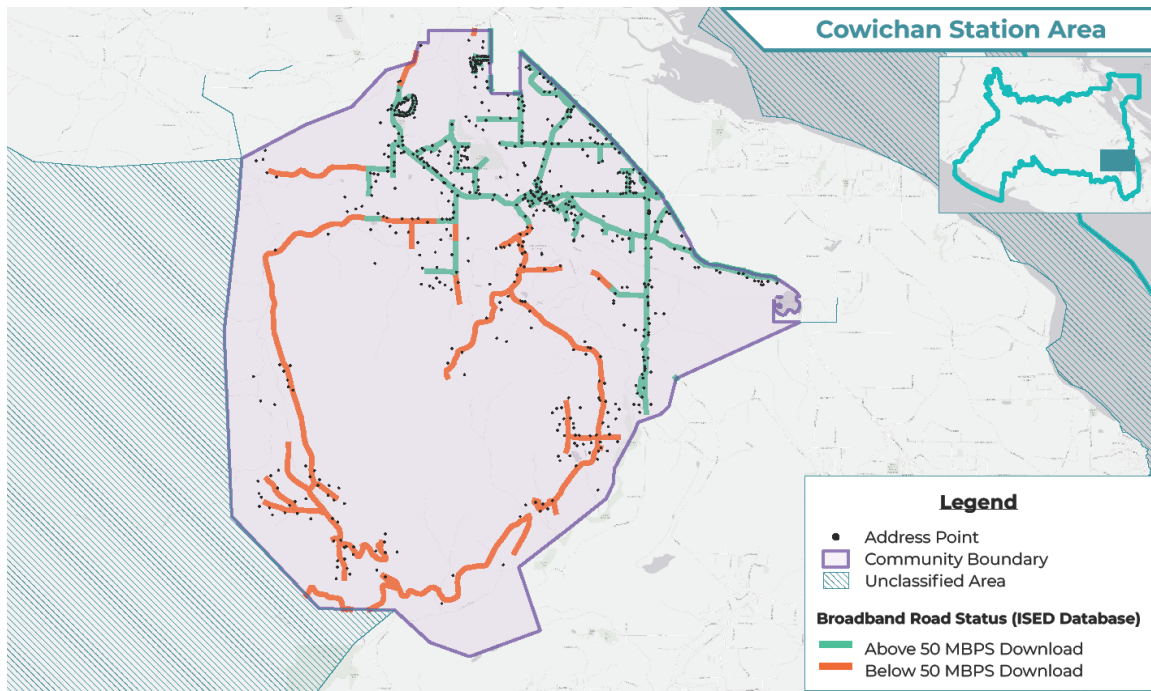


Figure 2: Cowichan Station Current State Broadband Coverage

4. WHAT WE HEARD

In September 2022, a community meeting was held to gather input from Cowichan Station residents on their priorities and concerns. The meeting revealed that residents enjoy the peaceful and private nature of their community, and view that improved connectivity will help to:

- provide better education opportunities for their children,
- better connect residents with friends and family, and
- enable improved access to services not easily available otherwise, including telehealth and community services registrations.

The expressed development priorities for the area included active transportation and reliable Internet, while the main concerns, or barriers to connectivity included:

- Poor and aging infrastructure,
- Resistance to change, and
- Resistance to cellular and wireless networks, due to the perceived health implications. It was noted that their highest priority was health.

Residents in attendance identified that they were concerned with the potential for cell tower and wireless proliferation in the area and supportive of maintaining some community control of a fibre build to help address these concerns.

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) 	<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/ IPS-Owned	<ul style="list-style-type: none"> • Community influence on initial build technologies and configuration • 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 • Open or closed network options 	<ul style="list-style-type: none"> • Responsible for network operations and maintenance
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

Model	Advantages	Disadvantages
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

Key challenges to extend connectivity across Cowichan Station include:

- Vegetation overgrowth, and terrain impacting aerial or underground cable placement in underserved areas,
- Ongoing maintenance and operational costs associated with joint use of BC Hydro and/or Telus pole infrastructure,
- Topology and vegetation attenuation of wireless RF signals,
- Lack of competition in high-capacity transport and local distribution,
- Funding and ongoing management of a broadband network,
- Public perception of and resistance to wireless infrastructure, and
- Potential safety concerns at tourist sites (Kinsol Trestle) for the community where insufficient cellular connectivity exists for access to emergency services.

7. OPTIONS

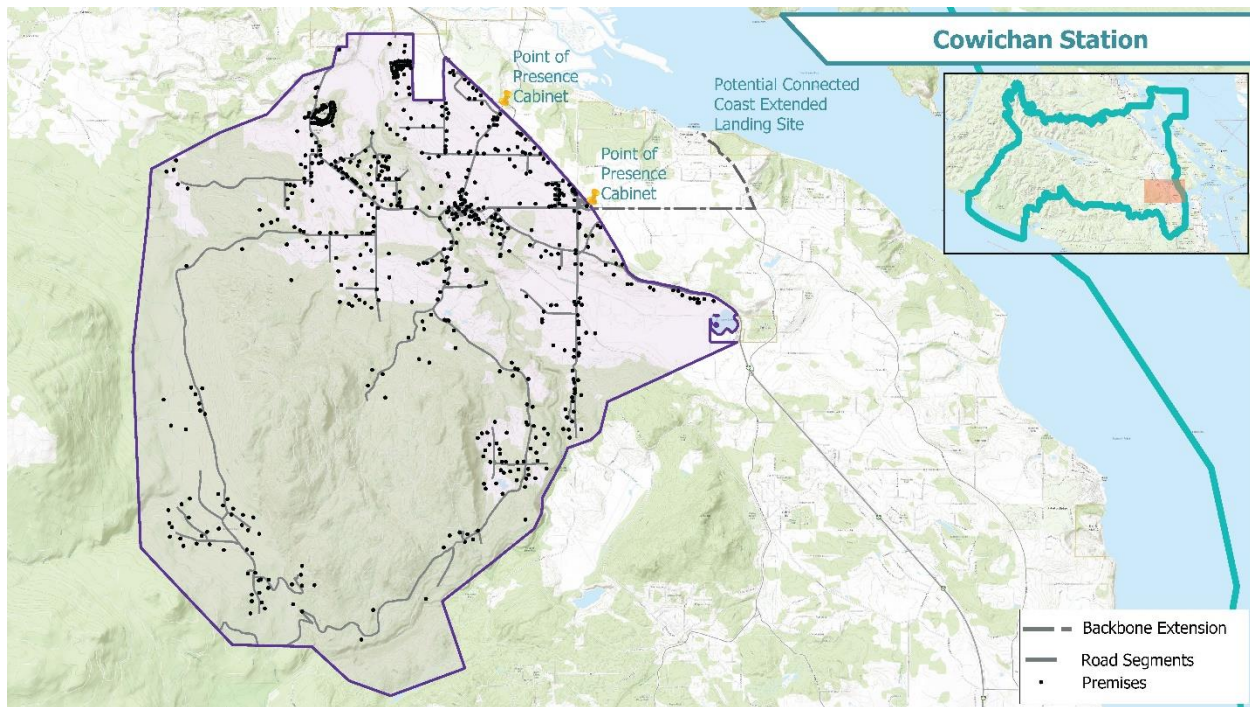
Where cellular service is insufficient to meet community safety requirements the CVRD must advocate to the incumbent service providers to resolve coverage issues immediately. Public safety is a leading concern for government support to the telecommunications industry and support from the industry is forthcoming. It is recommended that the CVRD supports and advocates to the service providers to ensure that all tourist sites in the region are serviced by minimum cellular coverage for security services.

When considering the options in the context of the community's expressed concerns and requirement to have control over technologies deployed, the most appropriate way forward would be to build a non-

wireless network, extending broadband to underserved premises throughout the community. There are two primary options available:

Option 1: Build a New Network to all Community Residents

This option involves building a new network to serve all road segments, shown in grey on the map below.



This would entail building a new community-owned network to all premises across the community, using fibre optic infrastructure to maximize lifespan, with strong consideration to an open network to maximize service provider choice for residents. The approach provides community control over initial and future technologies deployed as well as content (service providers accessible via the network). The network would have two points of presence in cabinets along Highway 1, for diverse interconnection to Shaw, Telus, and/or other service providers. It would also include an extended backbone to the coast at Cowichan Bay Road. This extension would enable connectivity to CityWest infrastructure, through a submarine extension from the Musgrave Landing Connected Coast landing site. Neighbouring communities would also benefit from additional service provider competition.

It is anticipated that a project to build and operate a community-owned network to only the 184 underserved homes would not reach critical mass required to turn a business case positive. It would be more viable, however, if the network also encompassed road segments and premises that were already served, providing opportunity for those currently dissatisfied with their existing service to support the community by sourcing their services over the community-owned network. An opportunity would also exist to expand the network further, into neighbouring communities.

The network could be funded through a combination of government grants (for extending broadband to underserved premises), a local area service, and potentially outside investors through a P3 partnership

or shared ownership. It could be operated by the community, or have its operations outsourced to a service provider, such as CityWest, or a third-party managed services provider, to leverage economies of scale achieved by managed services organizations. In the case of a P3 partnership, the network could be jointly owned by the community and the P3 partner. Ideally the network could be operated as an open network to encourage more service providers to provide more services to the community. This would also give the community more choices of online services and provide more potential lines of revenue for the network. Operations could be handled by the P3 partner, and revenues split. Operations would be funded by revenues, and the opportunity would exist to use any community portion of profits to pay down the funding provided by a local service.

When establishing a new corporate entity to deliver broadband services, which would be the case when the community builds, or partners to build its own network, registration with the CRTC would be required. This would be true, regardless of the network technology adopted (fibre, coax, or wireless). In an open network, the distribution network would place active electronics at each premise, and connect back to multiple ISPs, providing residents with a choice of service providers. In a closed network, the distribution network connects to a single service provider for connectivity to the Internet. The network could be built, managed and operated by the community, or by a contracted third party. Additionally, in order to provide grant funding applications, respondents are required to provide letters of support from the community. This gives the community further influence on the direction of the strategy in developing a network. Further community engagement will need to be conducted to ensure the specifics of this option are met for the community.

Construction Cost Estimate-Option 1

	Quantity	Unit Cost	Extended
Build network across all road segments (m)	73,218	\$60	\$4,393,080
Connect premises (ea)	635	\$1,000	\$635,000
Active Electronics (per premise)	635	\$1,000	\$635,000
Establish 2 points of presence at Highway 1 and connect to Shaw, Telus, Bell (ea)	2	\$5,000	\$10,000
Extend backbone to potential new Connected Coast landing site at Cowichan Bay Road (m)	4,500	\$60	\$270,000
Total Cost to Build Infrastructure and Connect Premises			\$5,943,080

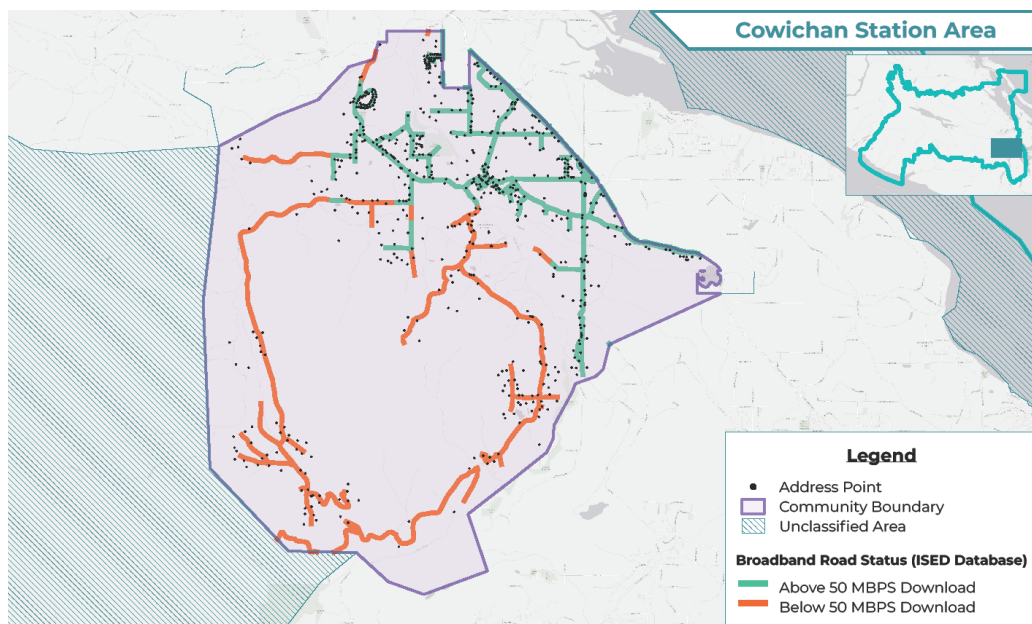
Funding Opportunities

Potential Provincial/Federal Grants (70% Construction Costs to Underserved Premises)			\$1,660,736
Unfunded Remainder		\$4,282,344	
Unfunded Remainder per premise		\$6,744	
Potential P3 Partner Investment (per premise)		\$3,000	
Total P3 Partner Investment			\$1,905,000
Community Funding (per premise)		\$3,744	
Total Community Funding (Local Service)			\$2,377,344
Total Funding			\$5,943,080

While this report provides the rationale for building a community-owned network, it is not a full business plan complete with cash-flows and detailed designs. If this option is pursued, it is recommended that the next steps include the development of a detailed business plan, with which to gain approval to establish corporate entities, confirm preferred governance structure, register with the CRTC, secure financing, resources, undertake engineered network design, negotiate partnerships, and establish operations.

Option 2: Subsidize an Existing ISP

Subsidize an existing ISP to extend their network to provide coverage along underserved road segments, shown in orange on the map below.



This would entail:

- Selecting Telus or Shaw and establishing an agreement to extend their network along underserved roads. As a fibre solution is preferred over cable, due to its extended lifespan and ability to deliver future higher speeds, a preference may be afforded to Telus.
- Providing community letters of support for the selected ISP to secure grant funding, on the condition that the service provider deploys non-wireless technologies; and
- In cases where service provider funding is marginally high, communities may benefit from providing an additional incentive (in the form of a per-premise subsidy) to the ISP, thereby improving their business case to undertake and prioritize the project above other competing projects.

While working with an existing ISP to extend their network may be the easiest solution, as it does not require the community to become involved in the construction or operation of the network, it would not provide community control over future technology decisions and would limit choice of service providers for premises served. In this particular case, as can be seen in the table below, a required investment of in excess of \$3,500 is getting close to the threshold for a viable business case for private

ISPs, so additional community funds may be needed to incentivize ISPs to prioritize Cowichan Station. Such subsidies may be funded through gas tax, or other mechanisms, such as local area services.

It should also be noted that while tying community funding to technology enables the community to have influence on the network technology, it may not provide opportunity to influence future service provider technology decisions.

Construction Cost Estimate – Option 2

	Quantity	Unit Cost	Extended
Build network across underserved road segments (m)	33,408	\$60	\$2,004,480
Connect underserved premises	184	\$1,000	\$184,000
Total Cost to Build Infrastructure and Connect Premises			\$2,188,480

Funding Opportunities

Potential Provincial/Federal Grants (70% Construction Costs)			\$1,531,936
Unfunded Remainder		\$656,544	
Unfunded Remainder per premise		\$3,568	
Suggested Community Subsidy per premise	184	\$1,000	\$184,000
Service Provider Investment	184	\$2,568	\$472,544
Total Funding			\$2,188,480

Regardless of the option selected, potential support mechanisms for CVRD may include:

- Creation of local area service to help fund the extension or creation of a distribution network, backbone and connectivity to underserved premises and communities.
- Utilizing the CRTC Broadband Fund's third call for applications⁵ may give the community options for transport grant funding assistance. Eligibility will have to be confirmed and applications must be submitted by May 16, 2023 and fall within the eligible area.
- Exploration of options to permit shallow-buried infrastructure within road shoulders to reduce ongoing operational costs related to joint-use fees to pole owners and reduce design/construction time.
- Exploration of options to leverage BC Hydro right of way and potentially to lease existing fibre strands for transport across the area.

CVRD advocacy would also be required to:

- Confer with higher tier governments to fund the construction and operation of the Cowichan Station project,
- Provide letters of support for all applicants that are following the CVRD plan requirements, if requested, for applications to grant funding from senior levels of government, and
- Support all appropriate applications in public meetings or engagements.

⁵ <https://crtc.gc.ca/eng/internet/apply-demande.htm>

For this call, we invite applications for the following types of projects:

- *transport infrastructure projects: a project that introduces or upgrades transport network capacity to one or more points of presence in underserved communities.*

8. RECOMMENDATIONS

Given the opportunities, challenges and costs associated with each option presented in this report, it is recommended that further community engagement be conducted to determine which option is preferred by residents and businesses. The options must be clearly communicated to the community through written material and a community meeting, and clear direction must be sought before implementation can take place.
