

REPORT

Electrical Utility

To: Mayor Johnstone and Members of
Council

Date: February 27, 2023

From: Rod Carle
General Manager, Electrical Utility

File: 2234665

Item #: 2023-136

Subject: BridgeNet Dark Fibre Utility

RECOMMENDATION

THAT Council receives this report for information only.

PURPOSE

To update Council on the BridgeNet Dark Fibre Utility

BACKGROUND

The BridgeNet Fiber Network evolved from the City IT Fiber Network into a commercial venture approved by the City of New Westminster in 2015 and initiated in late 2016. Having a reliable and robust fibre network infrastructure is critical to facilitating economic development and attracting new talents and industries to New Westminster.

The network is being built to support the local economy, residential ISP connectivity and City Facility IT connections as per the city' Intelligent City Initiative. The city fiber network connects 19 city facilities and saves the city IT department approximately \$270,000.00 a year in 3rd party connectivity based on 1GE connections to each building at today's commercial rates

BridgeNet's open-access to dark fibre network means more choice for New Westminster residents and businesses for their digital services. BridgeNet offers access to lightning fast internet at competitive prices and creates increased employment and investment opportunities in the city's knowledge sector.

BridgeNet provides New Westminster residents and businesses greater access to reliable, affordable high-speed internet services and improves choices by enabling more Internet Service Providers who can offer digital services in the community.

BridgeNet leases unused capacity in the City's carrier-grade fibre optic network to Internet Service Providers (ISPs) and telecommunication companies who in turn offer high speed internet, phone, TV/video services to local business and multi-family residential customers at some of the best rates in the country. With affordable and readily available high-speed broadband services, the City is equipped to attract more innovative companies and knowledge workers to the community, helping businesses of all sizes to compete in today's global digital economy.

Fibre can easily carry digital information over long distances, and is much faster than traditional copper wire services. With fibre, downloads and uploads occur simultaneously with no reduction in speed, creating the ideal environment for cloud access, big data, real-time applications, and heavy file transfers.

FINANCIAL ANALYSIS

2015 Estimates:

Financials to support the network build were based on revenues from ISP's selling services over the dark fiber network to:

1. MDU residential buildings of 50+ units
2. Local businesses
3. Government agencies
4. Telco's to support wireless networks
5. The local school district and other educational institutions in New Westminster

Capital Infrastructure: cost estimate to build out the network was set at \$10.9M with an added contingency of \$2.2M.

Operating Cost Estimates: ISP's were estimated at \$300.00 per month per building connected or via a revenue sharing formula (20% to 25% of building generated service revenue).

2022 Estimates:

Capital Infrastructure: spend to date to build out the network is \$9.4M; with \$7.9M from Debt Financing and the balance from Electrical Reserves.

Table 1-1 - Capital Budget vs Actual Cost to date

PROJECT COST COMPONENT	Budget	Cost To Date
Consultation	\$506K	\$416K
Utility Setup Cost	\$154K	\$260K
Engineering	\$1.7M	\$1,3M
Materials + Construction	\$7.8M	\$6,9M
Contingency	\$2.2M (unused)	\$0M
Colocation Facility	\$777K	\$493K
Total Project Cost (excl unused Contingency)	\$10.9M	\$9.4M

The following is the 5-year 2023-2027 Capital Plan for BridgeNet. Additional details can be found in Appendix 1.

Table 1-2 - BridgeNet 5-Year 2023-2027 Capital Plan

Projects	2023 Forecast	2024 Forecast	2025 Forecast	2026 Forecast	2027 Forecast
BridgeNet Fibre Fund					
11041 BridgeNet Infrastructure	526,817	-	-	-	-
12343 Pattullo Bridge Fibre	150,000	-	-	-	-
12407 Aff Housing Fibre Infrastruc	30,000	30,000	30,000	30,000	-
A0343 BridgeNet Regional Fibre Hub 2.0	-	2,000,000	-	-	-
Total BridgeNet Infrastructure	706,817	2,030,000	30,000	30,000	0

Operating Net Revenue Estimates: To date we have connected 86 residential MDU's, 16 local business and 5 Educational Institutions of which 17 residential MDU locations were added in 2022. To date from inception, total net estimated revenue received is \$0.85M.

2022 Operating Budget Service Enhancement: In 2022 the Utility Commission approved the investment of a Business Manager to accelerate the Revenue Growth as the infrastructure was being under-utilized; staff redirected efforts away from the infrastructure growth to focus on the revenue growth.

Progress in 2022/2023

- Total Buildings with SO's (non-city facilities) = 106
- Total new in 2022 = 17 (all residential MDUs)
- In Progress 2023 = 12
- New daycare connected at Portside development in Queensborough
- Colocation expansion is planned in 2023
- Working on updates to the BridgeNet website based on feedback and consultation with ISP's
- First 5 Gig business connection to local tech firm
- Completion of BridgeNet Construction Supplementary Guide (our version of an MMCD)

Challenges, Risks and Mitigation

1. Early construction, with a well-planned out micro-trenching scheme, did not have a solid quality control plan which has resulted in rework of existing infrastructure and a move from a single sourced (unit priced) contractor to a competitive job based tender process. This has added minor project delays and costs to the project.
2. 2018 and 2019 civil construction costs skyrocketed due to the development construction boom in lower mainland – this put pressure on our timeline and construction costs
3. Initial micro-trenching construction specifications were designed to a minimum 12" (100mm) depth conduit installation. However, we have moved to a minimum 18" (150mm) deep narrow trenching installation for a number of reasons:
 - a. Utility construction saw cutters are now using first pass 12" depth blades which can cut our cables before passing through our coloured warning grout.
 - b. Technical Safety BC is pushing for a minimum depth of any utility installation which will likely have an impact on future micro-trenching installations.
 - c. Higher Tier telecommunications providers, like Zayo or Bell, are hesitant to utilize shallow built 3rd party fiber networks and the extra depth will create better market confidence.
 - d. Construction costs for deeper trenches are approximately 15% higher, but the overall product is much better and easier to market to telecom industry.
4. Revenue forecasts from wireless companies and the school district are non-generating factors at this point in our business cycle. The local School District has a long term agreement with Telus to provide its network data/communication needs and that will likely not change without political support.
5. Planned building inventory of 125 units may not be met due to:
 - a. Lack of ISP inroads marketing to rental only buildings.

- b. Difficult to access existing communications infrastructure in townhome complexes.
 - c. Lack of city direction from development department to support open access communications infrastructure design criteria which would support competitive ISP's
 - d. High costs to 're-wire' in-building communication systems to accommodate use by competitive ISP's.
6. Joint construction projects with other departments in the city are not consistent in cost and a challenge to manage. There is good value in these joint projects, nonetheless.
7. Developer driven construction costs for offsite utility works are not always being borne by the developer. This is due to inconsistent internal messaging between planning and engineering groups regarding city communication installation per the city's development bylaw for offsite utility requirements.

COVID impacts:

- a. City Capital budget restrictions delayed build out to new neighborhoods and made it difficult to take advantage of joint builds with other city utility projects.
- b. Service orders for residential building connections have slowed as our ISP's utilize 'on-site' marketing programs which are impacted by COVID concerns.
- c. We may possibly see more residential MDU connections with more people working from home.
- d. Shaw and Telus have a rigorous upgrade program in place for people working from home, but sticker shock once promotional offers expire and higher costs kick in should provide a renewed appetite for a competitive ISP market alternative.
- e. There has been an impact to business connections due to the economic impact of COVID as companies move to have more of their staff work remotely.
- f. 2 new 'business focused' ISP's have delayed scheduling of equipment installation at our colocation facility due to the economic downturn impacts of COVID

Opportunities

Wireless Providers

Wireless providers in BC are TELUS, Rogers and Shaw who have plans to upgrade their fiber networks for wireless 5G deployment. These are all large providers with specific criteria to utilize other 3rd party last mile networks.

TELUS is the incumbent carrier (ILEC) in BC and has advised us that they have no interest in using BridgeNet fiber assets, while Shaw and Rogers have both had discussions with BridgeNet for their future requirements.

With pending upgrades to wireless networks (5G), Shaw and Rogers are good candidates to utilize our last mile fiber network. Bell Mobility has indicated they will keep their shared network partnership in place with TELUS Mobility for future wireless network deployments

Wireline Providers

Tier 1 wireline providers (Bell/Rogers/Shaw) who deliver traditional fiber based business connections have certain quality and operational requirements – we should look at a different fee schedule than we have for smaller providers (capital cost recovery and non-revenue share model)

To provide services to Tier 1 wireline providers we may need to negotiate upfront Access Agreements (BLA's) with building managers, developers and property managers. This will add up front and recurring costs and require outside firms to negotiate those agreements, but those firms are readily available.

Support Structure Agreements (SSA's)

Support Structure Agreements (SSA's) for pole attachments and spare capacity in underground fiber conduits and poles has good potential for future revenues.

Third party communications access to the city's poles and underground would also bring more competition to the city's telecommunications wireless market and have a positive impact on the local economy.

Typical SSA Pole and underground fee structures:

Distribution Fiber Urban pole attachments of less than 10km:

- a. \$1.61 per pole attachment and \$0.43 per 30 meters per month of messenger strand
- b. Maximum outside diameter of cable is 30.5mm
- c. All engineering and make ready costs paid by applicant
- d. \$2.25 per 30 Meters per month for underground conduit (\$0.90/meter/year)

Joint build and asset swap opportunities:

- a. Rogers and Shaw are looking to build out wireless network fiber backbones quickly and efficiently
- b. There will be opportunities to do joint builds in these situations which would save capital costs and upgrade the quality of the underground network we are building

- c. Swap and conduit/pole attachment criteria should be in place to take advantage of those opportunities
- d. These carriers will be looking for quick turnaround approval times to meet their planning and scheduling needs
- e. Governance on 'deals' should have weighting criteria in place for the Fiber and Electrical department to review and provide a streamlined approval process

BridgeNet 2.0

Our Chief Information Officer (CIO) prior to retiring promoted the BridgeNet 2.0 idea to have New Westminster be part of a lower mainland hub connecting surrounding cities and municipalities to the BridgeNet fiber network and connectivity to the Vancouver Internet Exchange (VANIX) at Harbour Centre.

This is a good opportunity for surrounding city and municipal IT networks to create a meshed fiber based redundant network with peer to peer opportunities. This would result in better network performance and a more robust network to better withstand catastrophic events like earthquakes and flooding.

It also opens up more revenue possibilities with connections between entities like Qnet in Coquitlam and BridgeNet in New Westminster. As well, there is wide spread support in the competitive fiber market to build relationships and goodwill with governmental organizations and city IT departments.

This requires fiber connectivity to be built between adjacent cities and municipalities. We have just completed our first dark fiber connection to the Qnet and the City of Coquitlam. We are in close talks with the City of Burnaby IT department to create an interconnection point over the next 12 months.

We have a conduit connection to the border of the City of Richmond, a possible connection to the Corporation of Delta via MOT ducts in Queensborough, and the Patullo Bridge will provide MOT conduit capacity between the City of Surrey and New Westminster. We have allocated funds to have a conduit connection installed between the Patullo conduit system and our BridgeNet infrastructure.

INTERDEPARTMENTAL LIAISON

The Electrical Department has been in regular consultation with the Finance Department staff.

OPTIONS

1. THAT Council receives this report for information only
2. That Council provide alternative direction.

Staff recommend Option 1

ATTACHMENTS

Attachment 1: 5-Year 2023-2027 BridgeNet Capital Plan

APPROVALS

This report was prepared by:

Rod Carle, General Manager, Electrical

This report was approved by:

Lisa Spitale, Chief Administrative Officer