Migisi Sahgaigan First Nation
Project Overview

November 08, 2021

Northern Project#2 – Problem Statement

The technology design proposed for the project needs to deliver a self-configuring, high-resilience, point-to-multipoint, fixed-wireless last-kilometer solution, covering distances of 1 - 3 km from the existing broadband Point-of-Presence (POP) in the community, as part of a highly innovative last kilometer (km) residential broadband solution.

Migisi Sahgaigan First Nation

Selected Host Community
Migisi Sahgaigan First Nation
(Formerly Eagle Lake First Nation)

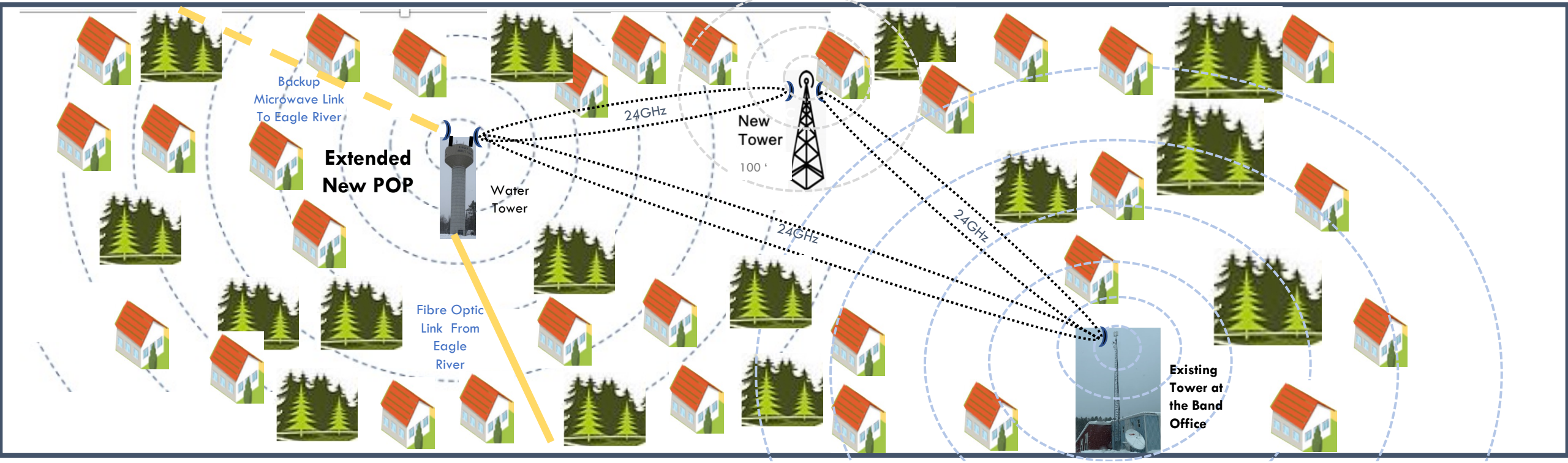
Host Community Strengths	Community Challenges	Community Needs
• 3 Towers owned by the community • Majority of community residences within 0.5 km of water tower • Near Baseball Diamonds is a great site for new tower to reach part of the community not well served currently • Band Office Tower will allow access to expanding part of community • 300' tower could provide backup access to Eagle River to ensure backup if fibre link was to get cut • Subsequent expansion phases available to the Resort, and Water Treatment Plant	• Only 50% of residents have adequate broadband • Broadband access and WIFI coverage inadequate when large community events occur • No broadband support to Resort limiting future development as treatment centre • Broadband access to school and band office could be better • No fibre backhaul support to community for future bandwidth options • Heavy Norway pine growths in the community	• 40-50% of community has no broadband access or very poor broadband access • Monitoring and reporting data from water treatment plant very difficult • Would like to expand broadband support to Resort for future treatment centre use • Would like to expand support for area of community designed for future growth • Better overall broadband would help with large Powwows and large tourism events

Camp Communications

Headquartered in
Kenora, Ontario

	Key Innovation	Key Differentiators
Technology Innovation	• 3 Tower FWA Innovation (1 new 100' tower) • Multiple Spectrum FWA • 20 km Underwater Fibre Optic Design • Microwave Redundant Backhaul	• High Bandwidth Fibre Internet Access for Future Growth • Wide selection of FWA for better customer experience • 3 Tower Solution to deal with tree cover and NLOS • Innovative Local ISP with Strong Business Case
Business Case Innovation	• Low Cost per Residence • Reasonable ROI Timeframe • Low Internet Access Costs • Low-cost Telephone Services	• No Data Cap for Internet Access • Range of Low-Cost Service Options • Affordable Internet Access Options • Implementation can support both the community and residences in the surrounding area

Last Km – Solution for the Community



New High-Availability Wireless Ring

- High-capacity 24 GHz Wireless Ring between towers

Low-cost POP Extension Solution

- High-bandwidth, submarine optical cable
- High-bandwidth, microwave backhaul protection

Addressing Fixed-Wireless Challenges

- Multiple WIFI Spectrum Solutions
- 3 Tower Approach for Maximum LOS

New Tower and Minimum Footprint

- Small low-cost, low profile equipment cabinet
- Environmentally controlled enclosure

Proposed Fibre Backhaul from Eagle River

- 18 km of Underwater Fibre
- Run down the riverbed from Town of Eagle River to Eagle Lake then underwater in the lakebed to Migisi Sahgaigan First Nation
- Three breakouts along the way offers chance to pick up other residential and commercial business along the way
- Very low cost to install using a barge, cable sinks into the bottom of the river and lake
- Fibre cable lands near water treatment plant then buried to water tower

High Performance WIFI Technology Proposed

A5c

Connectorized PTMP Access Point

4.9–6.2 GHz | 1 Gbps | 20+ km

MICROPOP PERFECTED

The Mimosa N5-360 antenna is designed to pair exclusively with the Mimosa A5c access point, and incorporates quad-panel 180 degree overlapping vertical and horizontal antenna polarizations. The innovative antenna design boosts throughput by providing balanced dual-stream coverage over 360 degrees of azimuth, exploiting beamforming gain, and extends the range of the MicroPoP deployments up to 60% compared with Mimosa's A5 integrated solution. Responding to customer demand for extended frequency range, the N5-360 operates from 4.9 GHz to 6.4 GHz without compromising performance.

SPECS

Gain	15 dBi
Frequency	4.9-6.4 GHz
Azimuth Beamwidth	360° via 4 overlapping 180° sectors
Elevation Beamwidth (3 db)	8°
Downtilt	2°
Dimensions	Height: 465 mm (18.31") including bracket Width: 80 mm (3.15")
Weight	1.11 kg (2.45 lbs)
RF Connectors	4 N-type female

Middle Km – Solution for the Community

Underwater Fibre from Eagle River to the Community

Significant Middle Km Cost Reduction

- **No Middle Km Pole Costs** – submarine fibre installation in river and lake beds, and using 24GHz fixed wireless for backhaul protection
- **Limited Digging Required** – 20 km of underwater fibre, only last km to water tower buried
- **Low cost backhaul from Eagle River** – Over **80% Cost Saving** vs from Tier 1 Backhaul Offers
- **Low-Cost Un-licensed Wireless Protection** – No monthly licensed spectrum costs
- **Lower Tower Costs** – potential to use community-owned 300 ft tower

Last Km – Solution for the Community

Fixed Wireless Access for the Whole Community

Significant Last Km Cost Reduction (70% lower than FTTH)

- **No Last Km Pole Costs** – using fixed wireless for residential broadband to residents
- **No Digging Required** – No trenching or plowing costs, using microwave radios between towers
- **Low Cost Backhaul from Towers** – use low-cost underwater fibre and unlicensed microwave
- **Reduced Tower Costs** – proposal to use 2 existing community towers, add only 1 new tower
- **Low Service Costs** – cost effective prices with no data caps

Community Benefits of Project

High-speed Reliable Broadband Internet Services to Underserved Residents

- Fixed wireless access to the home for up to 100 residences (Capacity for up to 240)
- No data cap! Low monthly internet access charges.

Multiple Wireless Tower Options for Access to Residents for 100% Community Coverage

- 3 Towers to ensure best chance at clear LOS per residence

This technology solution could be extended to future residential expansion of the community

- Significantly reduced incremental cost to support future community growth

Future-proof Fibre Optic High-Capacity Underwater Cable to Eagle River

- Internet access capacity can be increased as community needs increase in the future

Lower cost optional phone services

- Camp Communications will also offer optional lower cost value added telephone services

THANK YOU!

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