



Nipissing First Nation Residential Broadband Project Overview

Northern Project #4 – Problem Statement



Northern Ontario Community that needs to extend broadband service from a part of the community that is well served in the community centre, or a more-densely populated area, to an area that is underserved in one or more out-lying lower-density residential areas greater than 5 km out, but still within the municipal boundaries of the host community.

Nipissing First Nation



Single tower design made possible by hybrid TVWS and 5GHz radio design for flat terrain, broadcast across lake, and clear access to distributed lakeshore community.

- ✓ Progressive First Nation
- ✓ Motivated to grow urban housing
- ✓ Easy to extend support to 4 new subdivisions
- ✓ Available optical POP in the Community
- ✓ Community open to building new towers
- ✓ Good Match for Problem Statement
- ✓ Over 5km from tower site to outlying communities
- ✓ Relatively flat terrain and good wireless access over lake
- ✓ Single tower design feasible

Leapfrog Telecom

- ✓ Strong Local Support Presence in North Bay Area
- ✓ Extensive Experience in designing wireless distribution networks in Northern Ontario.
- ✓ Significant Growth over last 2 years in staffing and support
- ✓ Proven willingness to provide innovative solutions and adjust design to scale to changes in available budget
- ✓ Innovative and low-cost approaches to tower deployment and hybrid radio technology for distribution.
- ✓ Very good pricing for broadband internet POP access in community from Eastlink.

Key Innovation – Single Tower with both TVWS and 5GHz Radio Equipment



100'
Non-Penetrating
Tower

Climate Controlled
Equipment
Shed

Middle Km TVWS and 5GHz FWA distribution using single 100 ft non-penetrating tower instead of conventional steel self-supporting or guyed Telecommunication Towers. This approach allows fast and low-cost rollout of fixed wireless distribution with excellent tree foliage penetration.

Key Advantages of Single Tower with TVWS/5GHz

- ✓ **Minimal Environmental Impact** – no foundation excavation and no concrete foundation required.
- ✓ **Fast Installation and Service Rollout** – Radio equipment installation and tower raising only takes about 3-4 days.
- ✓ **100' Tower is Lower Profile** – lower visual impact to the community.
- ✓ **Significantly lower cost**, use of TVWS reduces need for 1 - 2 additional towers (Up to \$150,000 to \$300,000 saved per tower in cost saving)
- ✓ **Significantly lower time to deploy**, single tower build saves months of permitting and build time for other towers.

700 MHz TVWS Radios for Tree Cover Penetration and 5GHz Radios for Clear View of Tower



- Hybrid fixed wireless solution
- Supports 5.0 GHz unlicensed internet access services and Licensed TVWS internet access Services
- Range of services offered
 - New 25/5 Mbps and 50/10 Mbps internet access services (TVWS – 700 MHz)
 - New 50/10 Mbps, 100/10 Mbps, 150/10 Mbps, and 200/20 Mbps internet access services (5 GHz)

700 MHz TVWS Radios for Tree Cover Penetration and 5GHz Radios for Clear View of Tower



6Harmonics

- Point to Point, Point to Multipoint or Mesh
- Support dual channel operation
- Up to 60 Mbps UDP per radio link
- Up to 23 dBm transmit power
- Low latency (< 5 mS)
- Adjacent channel blocking
- 256bit AES encryption
- IP67 enclosure

Distribution

- 700 MHz Point – Point High-Capacity Microwave Radios
- Used to distribute internet access to residents through dense tree foliage
- Service delivery up to 50 Mbps Down/ 10 Mbps Up
- Up to 30 km range



LTU Rocket

LTU LR

- 5 GHz PtMP LTU Client,
- functions in a PtMP
- Works with LTU-Rocket as base stn
- 26 dBi Antenna Range: up to 30 km

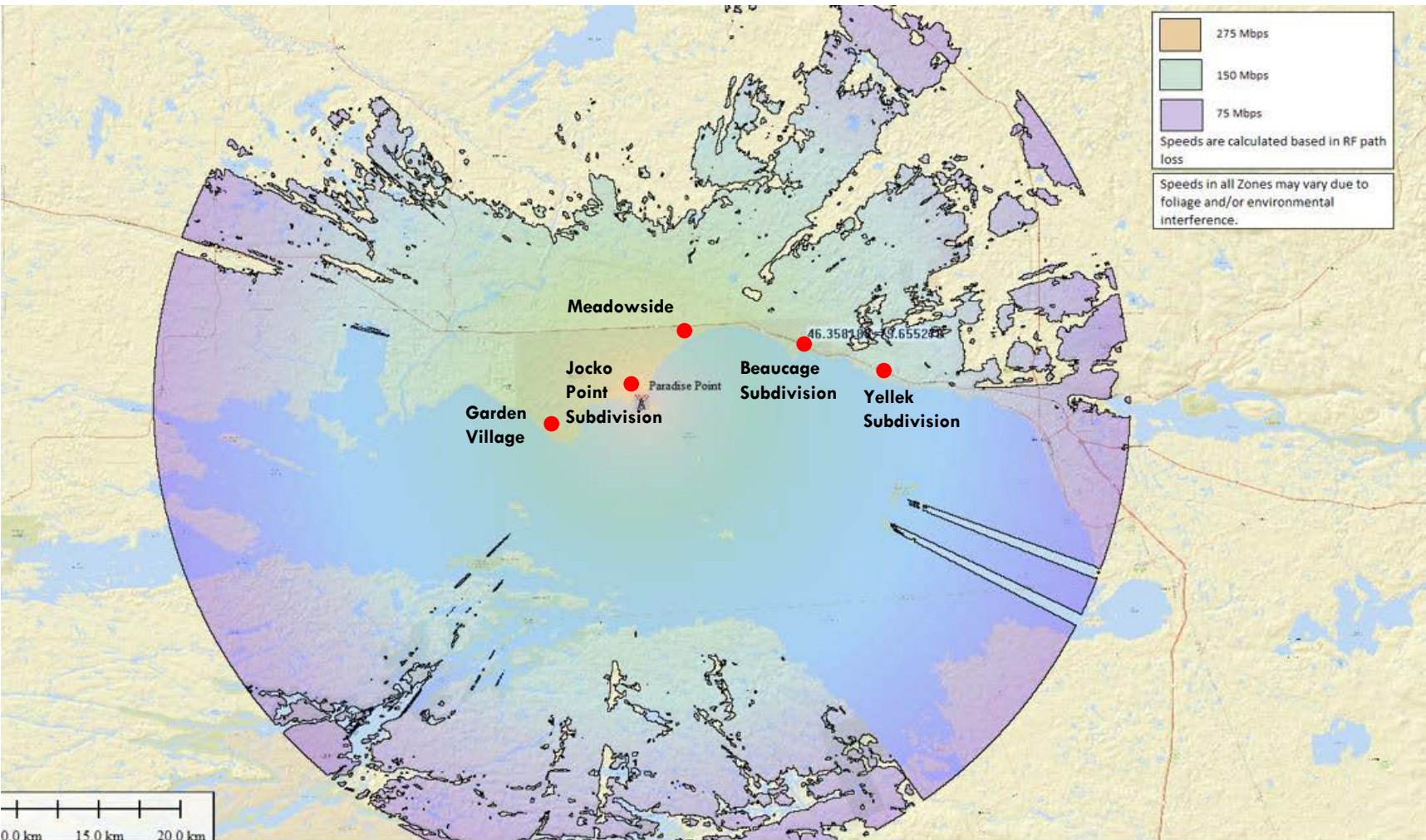
LTU Rocket

- 500+ PtMP performance
- Up to 256 connections per tower

Distribution & Backhaul

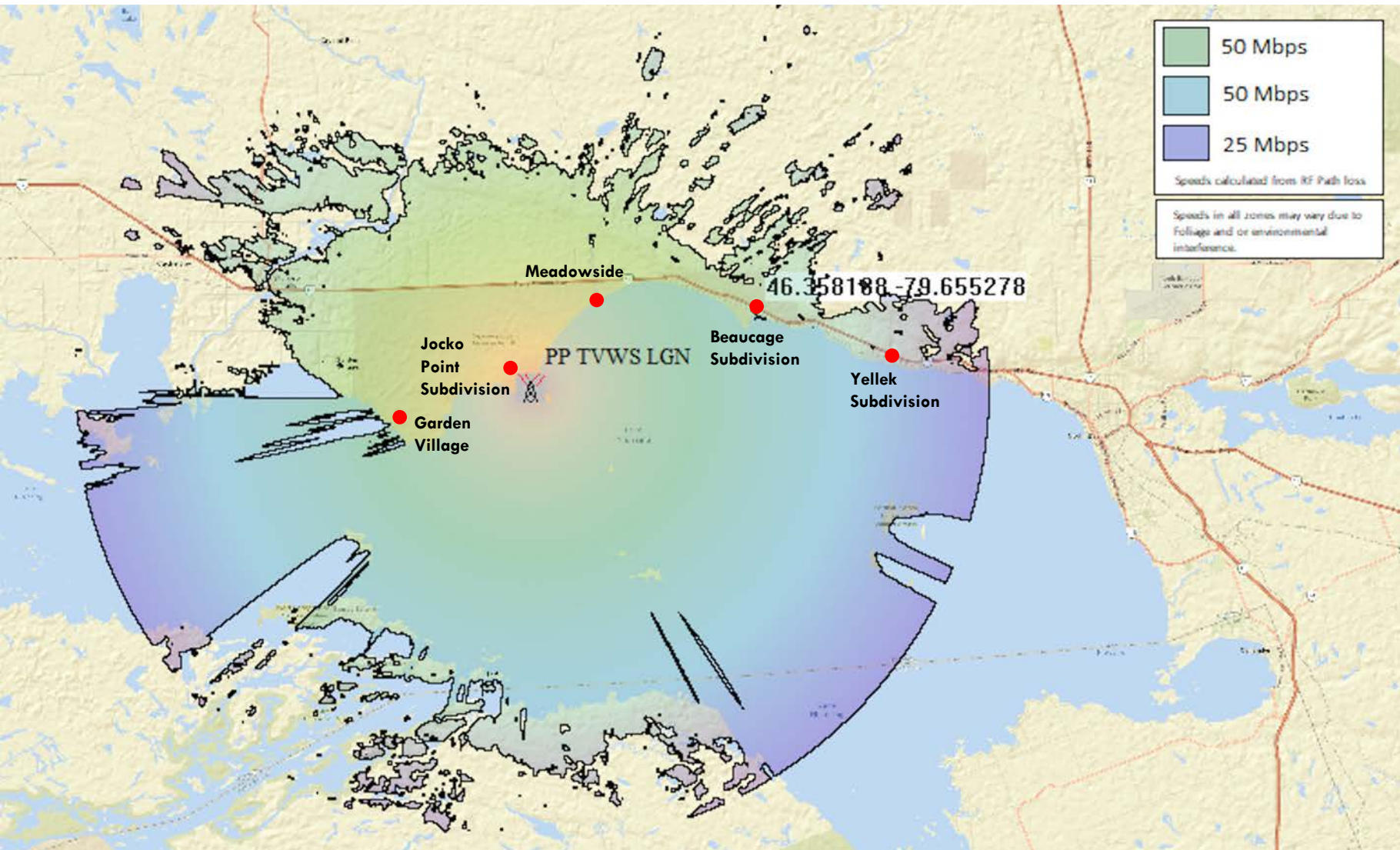
- 5 GHz Point to Multi-point – Microwave Radios
- Used to distribute to residents with clear LOS
- Service delivery up to 200 Mbps Down/ 20 Mbps Up
- Up to 30 km Range

5 GHz LTU Coverage Area



- Coverage Area will reach entire Nipissing FN with greater than 50/10 performance
- All 5 areas of community could get up to 150 Mbps service
- Garden City and Jocko Point could get better than 150 Mbps service support

700 MHz TVWS Coverage Area



- Coverage Area will reach entire Nipissing FN with 50/10 performance

New Service Offerings

Service Offerings

- 50/10 Unlimited	Download speeds up to 50 Mbps Upload speeds up to 10 Mbps	Unlimited Data	\$ 80/month
- 100/10 Unlimited	Download speeds up to 100 Mbps Upload speeds up to 10 Mbps,	Unlimited Data	\$100/month
- 150/10 Unlimited	Download speeds up to 150 Mbps Upload speeds up to 15 Mbps	Unlimited Data	\$110/month
- 200/20 Unlimited	Download speeds up to 200 Mbps Upload speeds up to 20 Mbps	Unlimited Data	\$145/month

Home phone service could also be installed with this solution

- \$19 unlimited Canada-wide calling or \$22 monthly with unlimited North American calling

TV packages can be added for \$40 - \$95 per month

Benefits to the Community

- ✔ **Significantly Better Internet Access + Low-Cost Telephone + Low-Cost Video** for residents.
- ✔ **Only single 100' Non-Penetrating Tower Required** for whole community.
- ✔ **Fast deployment** to meet needs of pandemic internet work at home, learn at home demands.
- ✔ **Access to 50/10 Mbps and up to 200/20 Mbps** Internet Access Service with **no data caps**.
- ✔ **Proven cost-effective method to add new tower for expanding improved internet services** if required as community grows.
- ✔ **Wider 50/10 Mbps or higher service access** to remote parts of the community.
- ✔ **Minimal environmental impact due to non-ground penetrating tower.**



THANK YOU!