CENGN

# Nipissing First Nation Project Overview

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# 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 and flat terrain and 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

# Leepfrog 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 TVWS and 5GHz LTU

**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.

# Wireless Technology Used

## 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 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

# Wireless Technology Overview

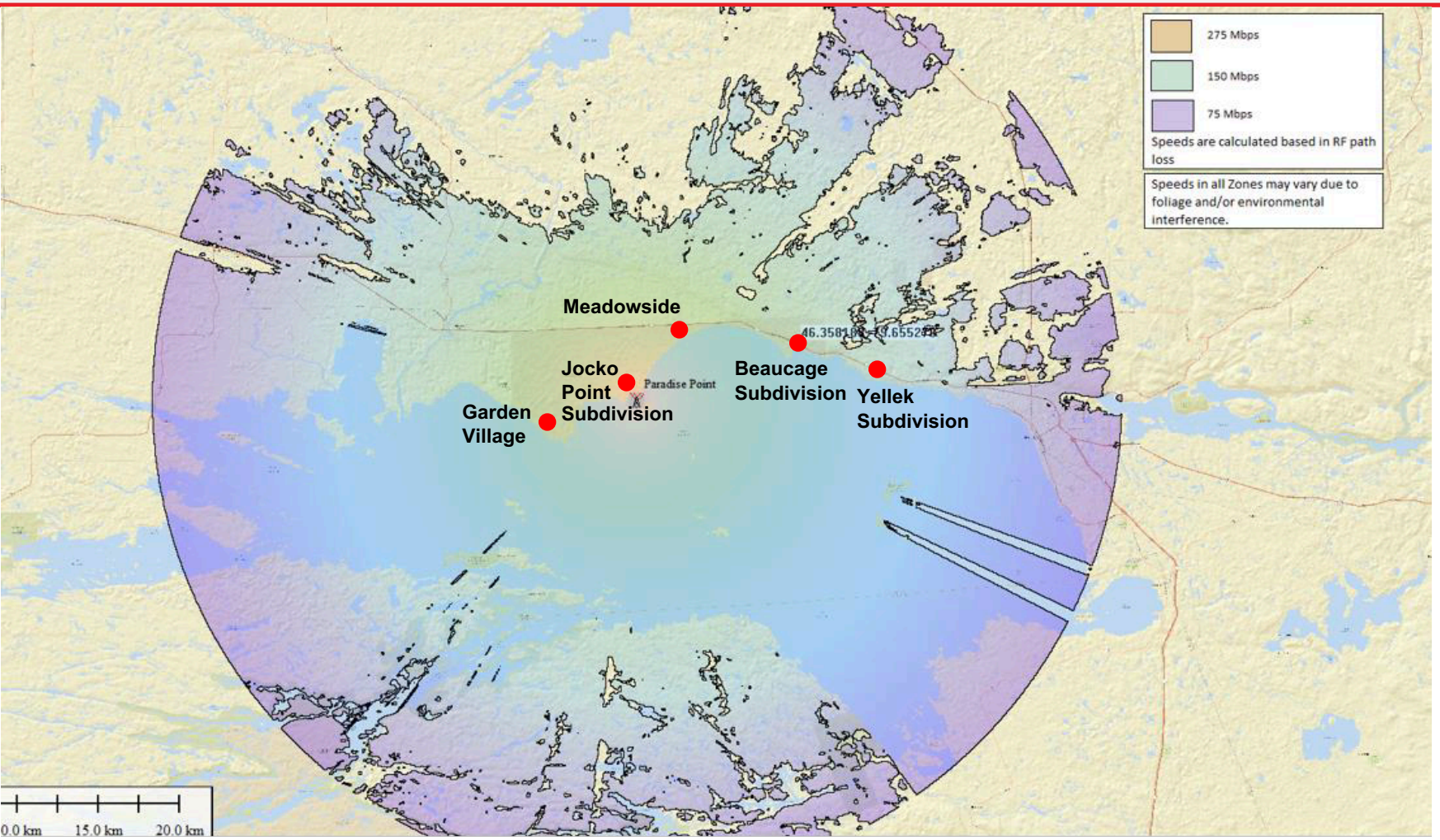
**Symmetrical Horn TP Antennas**

- No Side Lobes
- Very selective reception just to the main beam
- Facilitates spectral reuse for broadcast in different directions
  - Ideal for small towers or dense configurations

**Hybrid Radio Tower Configurations**

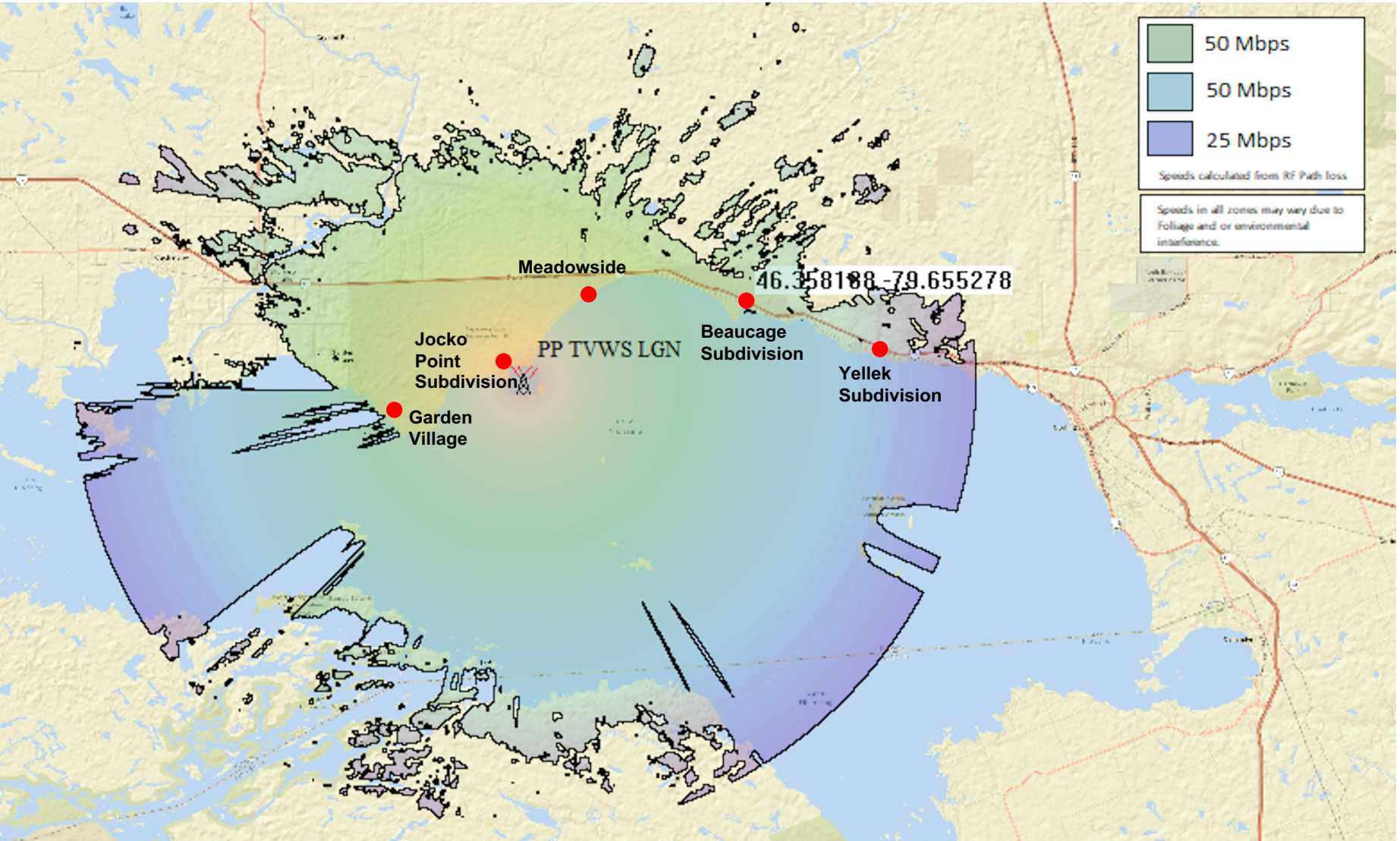
- Hybrid fixed wireless solution
- Supports 5.0 GHz Unlicensed internet access services and Licensed TVWS internet access Services
- Range of services offered
  - New 25/5 Mbps and 50/10 Mbps internet access services (TVWS)
  - New 50/10 Mbps, 100/10 Mbps, 150/10 Mbps, and 200/20 Mbps internet access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

# 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

# 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<br>Upload speeds up to 10 Mbps | Unlimited Data | **$80/month** |
| **- 100/10 Unlimited** | Download speeds up to 100 Mbps<br>Upload speeds up to 10 Mbps, | Unlimited Data | **$100/month** |
| **- 150/10 Unlimited** | Download speeds up to 150 Mbps<br>Upload speeds up to 15 Mbps | Unlimited Data | **$110/month** |
| **- 200/20 Unlimited** | Download speeds up to 200 Mbps<br>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

NIPISSING FIRST NATION
A-Kii, Bemaadzijik, E-Niigaanwang
The Land, the People, the Future

# Benefits to the Community

CENGN

- **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**.