



# **NIPISSING FIRST NATION PROJECT OVERVIEW**

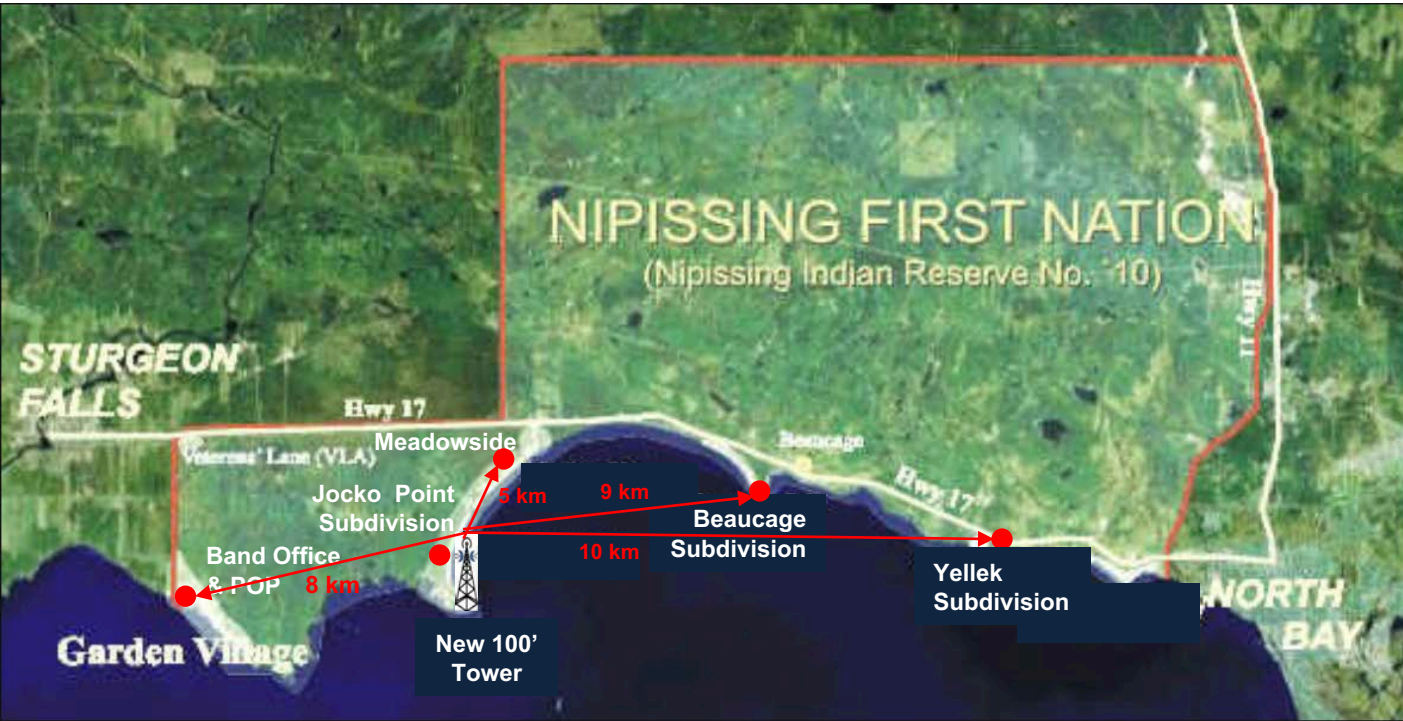
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BROADBAND PROGRAMS**

# 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

- ✔ 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



- 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



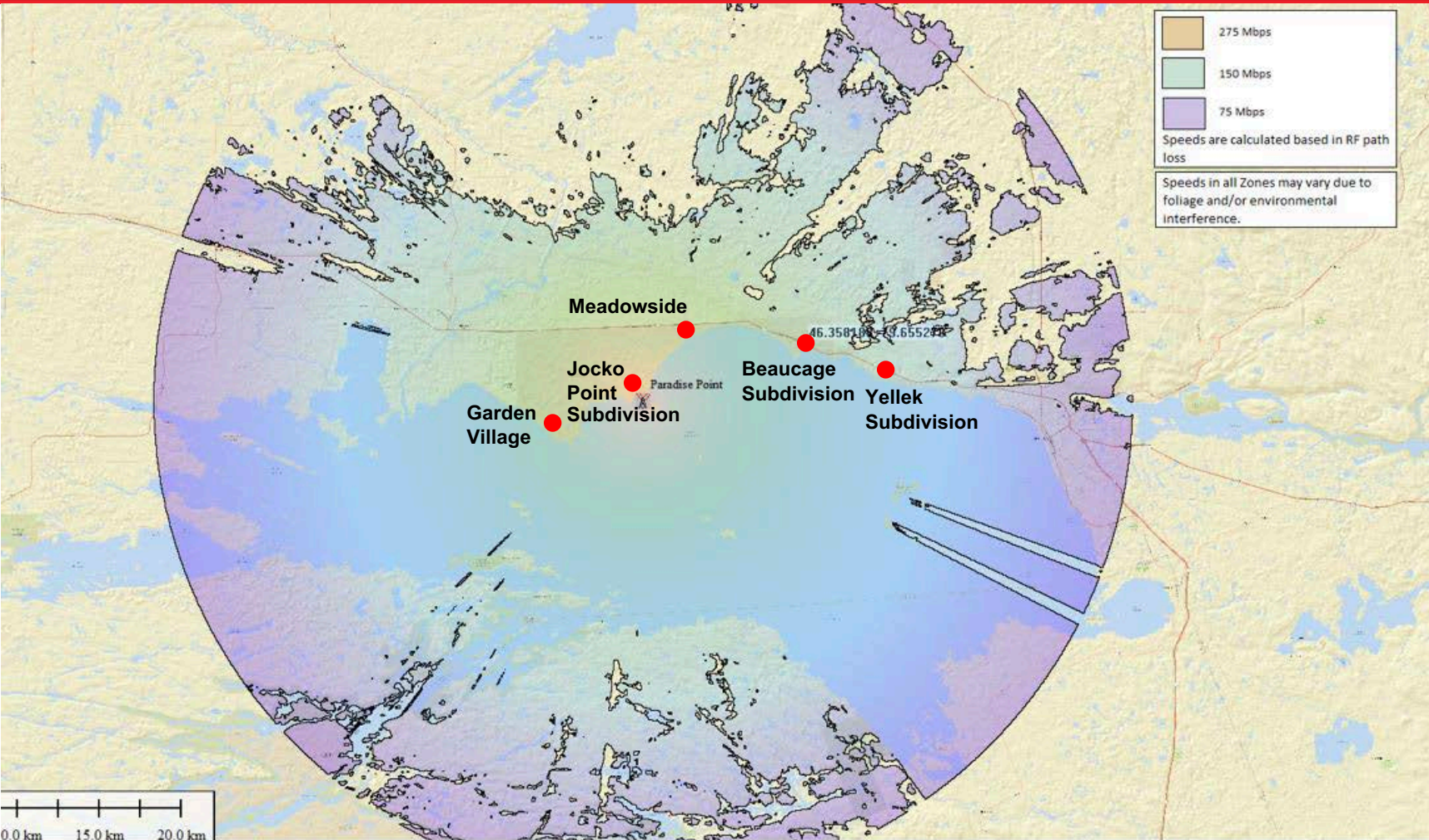
**Symmetrical  
Horn TP Antennas**



**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)

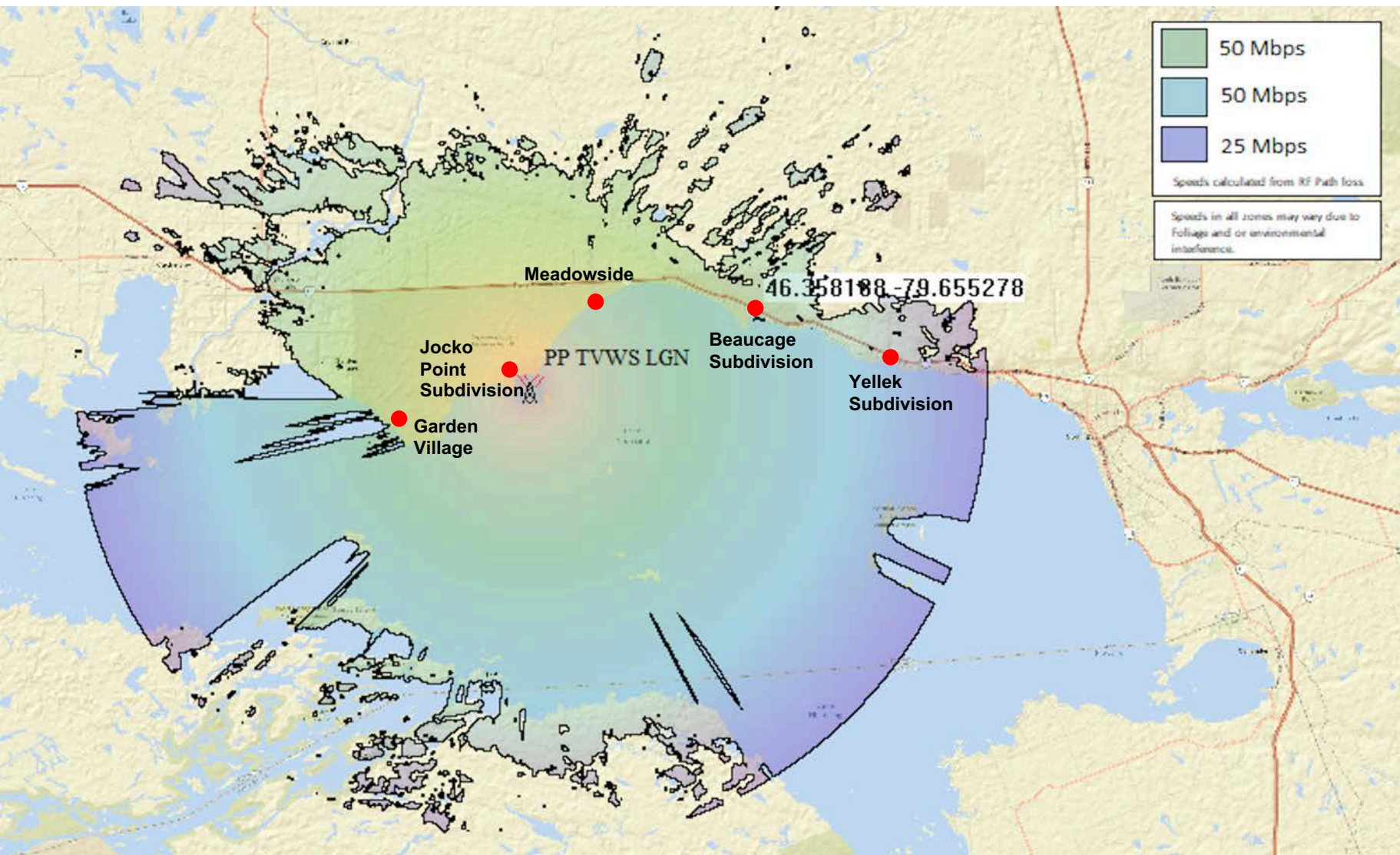
# 5 GHz LTU Coverage Area



- 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

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

**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

- ✔ **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.**