

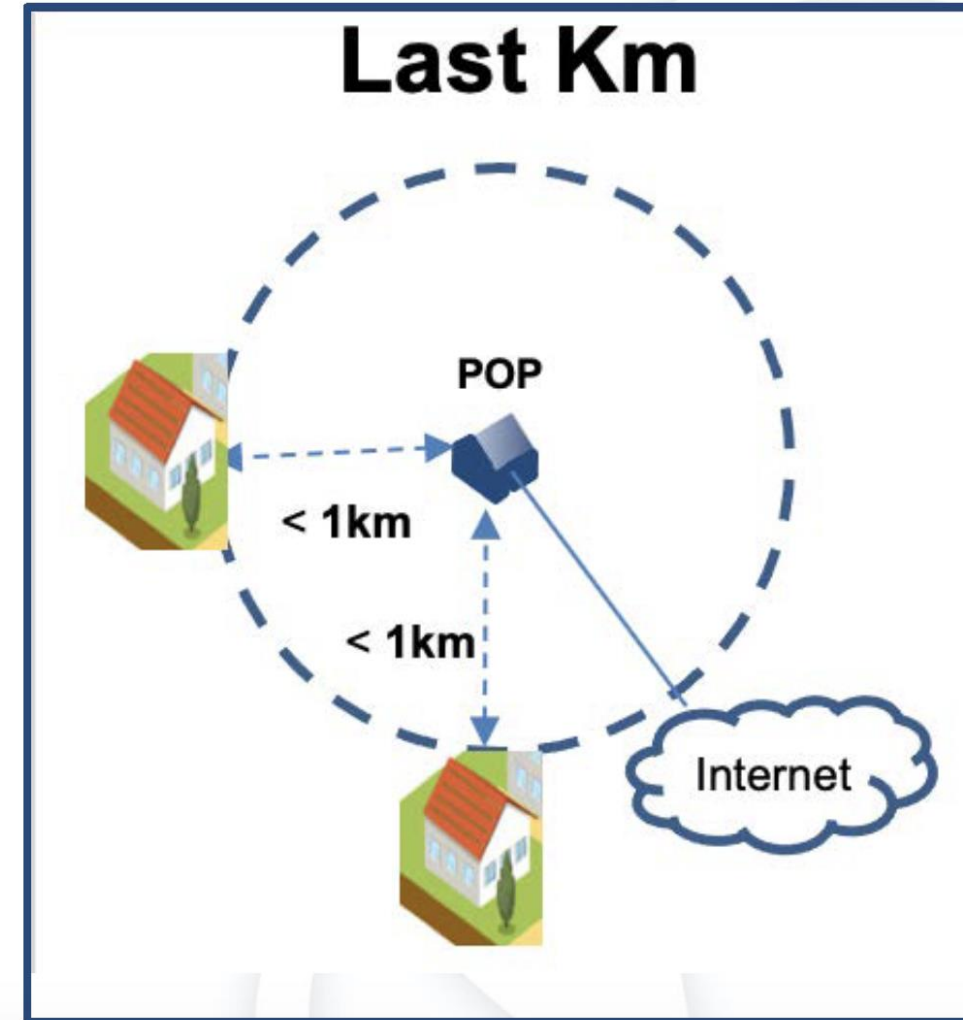


Solving a Last Km Distribution Requirement in Iron Bridge

Project Problem Statement

A Last-km Broadband Problem Statement

A technology solution is required to provide a cost-effective, self-configuring, high-resilience, point-to-multi-point wireless solution covering distances of 1-3 km from the broadband POP in the community.



Selected Technology Partner



Headquartered in
Richmond Hill, Ontario

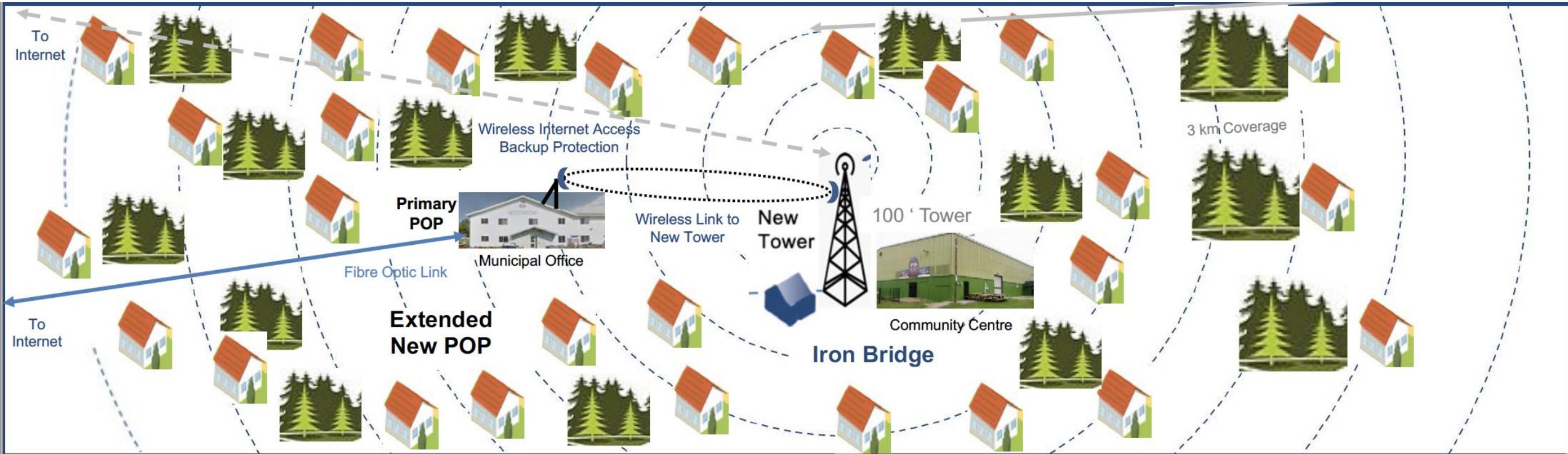
Company Overview

- Innovative wireless technology – deals with dense tree cover with TVWS radio technology, to access local homes for last km.
- Uses hybrid solution with 2.4GHz and 5GHz WIFI access for access to homes where less dense tree cover is present.
- Extensive wireless experience
- Offices in Ontario and Alberta
- Local support and installation staff in Northern Ontario
- Extensive wireless experience
- Wide product offering using IoT technology including mobile VoIP, VoLTE, VoWIFI, IPTV, **no data cap**, no contract.

Northern Ontario Community Experience

- Rapidly expanding in Northern Ontario
- Experience in forested areas of Alberta and Southern Ontario

New Broadband System for Iron Bridge



- ✓ **New TVWS Technology for Dense Tree Areas**
 - Primarily dense tree residential application

- ✓ **Protected Internet Access from New Tower**
 - High-bandwidth, fixed-wireless, microwave radio link

- ✓ **Multiple Wireless Options to the Home**
 - Multiple WIFI Spectrum Solutions
 - TVWS for Dense Tree Cover

- ✓ **New Environmentally Friendly Tower**
 - Non-penetrating Tower
 - Solar-Powered Equipment Building

Wireless Technology Innovation

Hybrid Fixed Wireless Last km Internet Access Service Delivery, within the community of Iron Bridge

Different Wireless Solutions for Different Levels of Line of Sight

- ✓ **5 GHz unlicensed WIFI** - 150/15 Mbps service where clear LOS is available within 1 km
- ✓ **2.4 GHz unlicensed WIFI** - 100/10 or 50/10 Mbps service with moderate tree cover within 2 km
- ✓ **700 MHz TVWS** – 50/10 Mbps service with dense tree cover up to 3 km from tower

New Tower Innovation – Non-ground-Penetrating 100' Tower

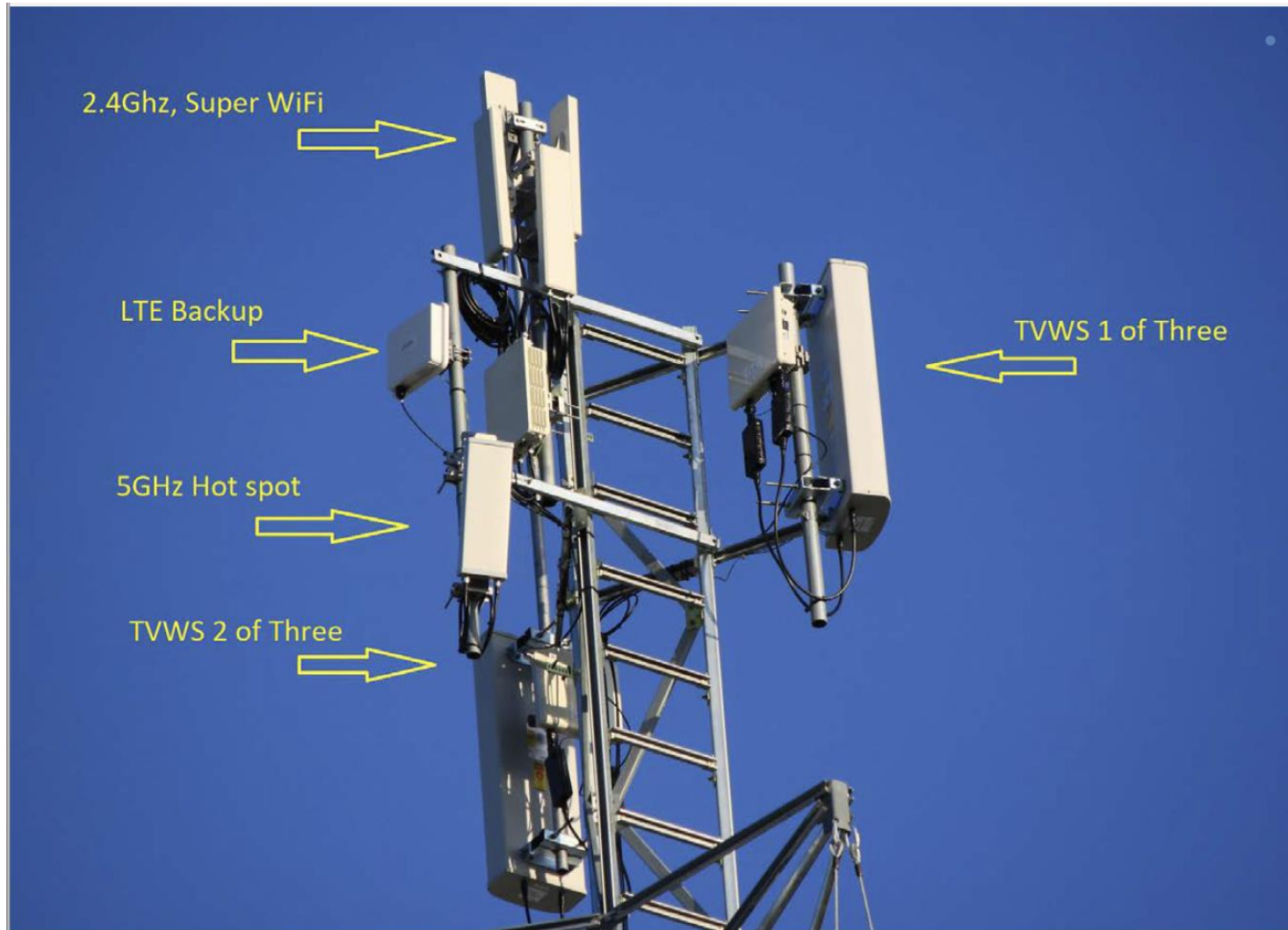


**Total time
to raise the
new tower
4 minutes!**



Sept. 11, 2020

Hybrid Radio Distribution Solution



Hybrid Radio Technology Solution

- **3.65 GHz LTE** IoT Solution for Emergency Backup of Internet Access
- **5 GHz WIFI** High Speed Internet Access Service Support
 - 1 km radius Line of Sight
- **2.4 GHz Super WIFI** High Speed Internet Access Service Support
 - 1-2 km radius better tree foliage penetration
- **470 MHz - 698 MHz Television White Space (TVWS)** High Speed Internet Access Service Support
 - 1-3 km radius superior dense tree foliage penetration

New Solar-Powered Equipment Shed – Base of the New Tower



- Solar Powered with Inverter/Battery Backup
- High Reliability support for Tower Equipment
- Attractive and clean enclosure
- Climate Controlled (heating and ventilation provided)
- Provides more equipment support for hub location in Iron Bridge, for centralized support for multiple communities

Community Benefits of Project



High-speed Reliable Broadband Internet Services to Underserved Residents

- Fixed wireless access to the home for up to 100 residents (Capacity for up to 300)
- **No data cap!!** Low monthly internet access charges.



Multiple Wireless Options for Access to Residents

- Choice of technology will be based on level of line-of-sight to the new tower
- Two choices optimized for near line of sight (some tree cover) or non line of sight (heavy tree cover)



This technology solution could be extended to the other 2 nearby communities easily

- Significantly reduced incremental cost per community (Dean Lake and Sowerby)



WIFI extension to municipal staff can lower cell phone costs for community

- Access can be extended from this new tower to allow municipal workers to use WIFI instead of cell



Lower cost optional phone and television services

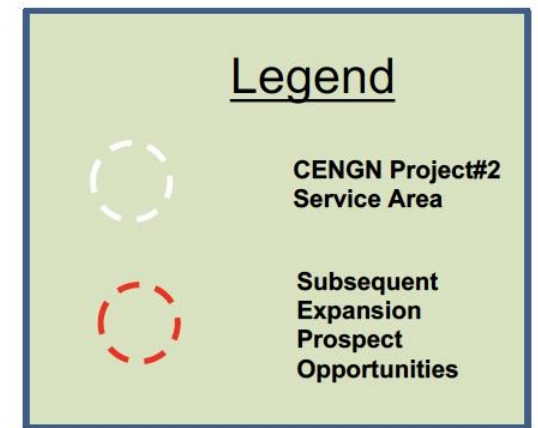
- Leapfrog Telecom will also offer optional lower cost value added services via wireless access

Subsequent Network Expansion Opportunities



Using the same technology approach as the CENGN project, additional communities within Huron Shores could be upgraded with a very cost-effective solution to provide much better broadband access.

Leapfrog Telecom is interested in working with the community to extend Service to Sowerby, Dean Lake and other communities within Huron Shores.



Overall Impact of the Project



High-speed Reliable Broadband FWA Internet Services to Underserved Residents

- High-speed wireless access for up to 90 homes and multiple businesses



High-speed Reliable Broadband for Ministry of Education Funded Underserved Students

- Wireless access for at least 3 additional local students for home learning



Approximately \$166,000 CENGN Investment resulted in over \$600,000 Investment

- Leepfrog and Surrounding Communities are in discussions to invest over \$600,000 into broadband in this and 3 other spin-off projects using the same technology solution blueprint used for this project



3 Other Spin-Off Projects Planned for Municipality of Huron Shores & Sault Ste. Marie

- New broadband service expansion under discussion with 3 other nearby communities



300% Business Growth Potential for Leepfrog Telecom in the Huron Shores Area

- Leepfrog Telecom is also offering lower cost telephone and IPTV access services via wireless services

Contacts for More Information

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