Dealing with Technical Challenges for Residential Broadband in Northern Ontario

Kirby Koster, Senior Manager
Broadband Program
CENGN Vision and Mission

Advancing global technology innovation for the prosperity of all Canadians

CENGN drives technology innovation and industry growth through our test bed, technical expertise, talent development, and partner ecosystem
CENGN Program Areas

Smart Agriculture
- Infrastructure to support Agriculture SMEs & innovation projects.
- Local IOT and wireless capabilities

Smart Mining
- Testbed for demonstration of ICT technology in a working mining environment to drive the commercialization of innovation

Rural & Northern
- Identify and demonstrate NGN technologies, solutions, and business models to expand broadband internet connectivity in rural and northern Ontario.

AVIN
- Providing connectivity requirements to test track to demonstrate and develop Autonomous Vehicle technology.
Residential Broadband Innovation Projects

- 8 Residential Broadband Projects across Northern and Rural Ontario over the next 2 years

- 3-6 Month technology project to prove residential broadband technology solution
- 50% of expenses funded, up to $500,000 from CENGN, per project

- No cost to host community participating in residential broadband project
- Technology applicant must be willing to fund up to at least 50% of the cost of the project

**Primary Objectives of Program:**

1) Drive and support innovative solutions that solve real problems for small communities.

2) Select Technology Applicants that have the drive, ability, experience, and technology that can be deployed in a commercial service that will meet the performance needs of the community.
Residential Broadband Access

**Technology** - copper/cable, wireless, optical, or satellite.

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No Last Km Access

POP in community but no residential broadband access.

Technology Solutions for Small Communities

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<td>5G Massive MIMO - New multi-dimensional modulation dramatically increases bandwidth and coverage.</td>
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<td>5 – 10 km Range Performs well in heavily treed areas Penetrates buildings</td>
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## Middle Kilometer – Broadband POP Extension Technical Solutions

**Middle-KM POP Extension Needed**

POP in main community but no residential broadband access in remote community or residences.

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Very High Optical Fibre Installation Costs

New and innovative approaches to fibre installation techniques and armored cabling technologies can eliminate the need for trenching or hanging fibre from poles.

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<td>High BW, Data Compression, Licensed Spectrum, and Lightly Licensed eg. Eband</td>
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Project#1 – Innovative Middle Km Solution

- **FTTH - Future-Proof Last-kilometer Solution**
  - Cost-limited 4 km buried optical fibre ring

- **Low-cost POP Extension Middle-km Solution**
  - High-bandwidth, fixed-wireless, microwave radio link

- **Avoided Fixed-Wireless Challenges**
  - Towers ensure Line of Sight above dense tree canopy, large water bodies, & hills of rock/forests
  - Buried optical fibre in gravel shoulder of roads means dense tree cover for last km not an issue
Cost Reduction Innovation

Fixed Wireless POP Extension, with FTTH loop in outlying community

**Significant Last Km Cost Reduction**

- No Last Km Pole Costs - road shoulder plowing and horizontal drilling for fibre

**Very Large Middle Km Cost Reduction**

- Very Large Reduction in Middle Km POP Extension Costs - reduced by 85%
- No Middle Km Pole Costs – no poles required, no pole replacements, no pole engineering
- No Middle Km Fibre Costs – no fibre required for middle kilometer

$1.2 Million Cost Saving
Subsequent Network Expansion Opportunities

Using the same technology approach as the CENGN project, additional townships could be reached with new tower sites to provide much better broadband access.
Contact Info

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