

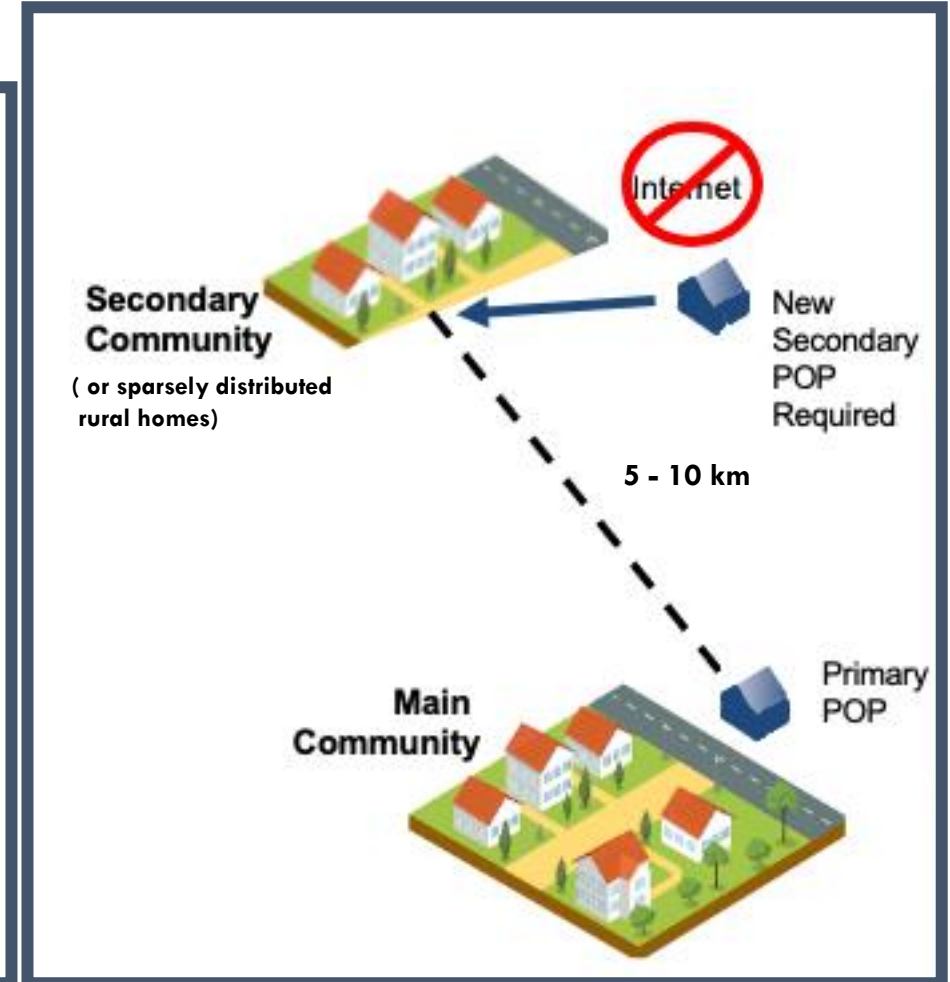


Providing Middle
Km Access
Over Rolling Farmland
in Rural Milton – Halton
Region

Project Problem Statement

A Middle-km Broadband Problem Statement

A technology solution required to provide a cost-effective, self-configuring, high-resilience, high performance solution extending internet access service distances of 5 - 10 km from the broadband POP in a host community. This high performance residential broadband solution needs to work across rolling hills of farmland with moderate tree cover.



Selected Service Provider



Headquartered in Calgary,
Alberta

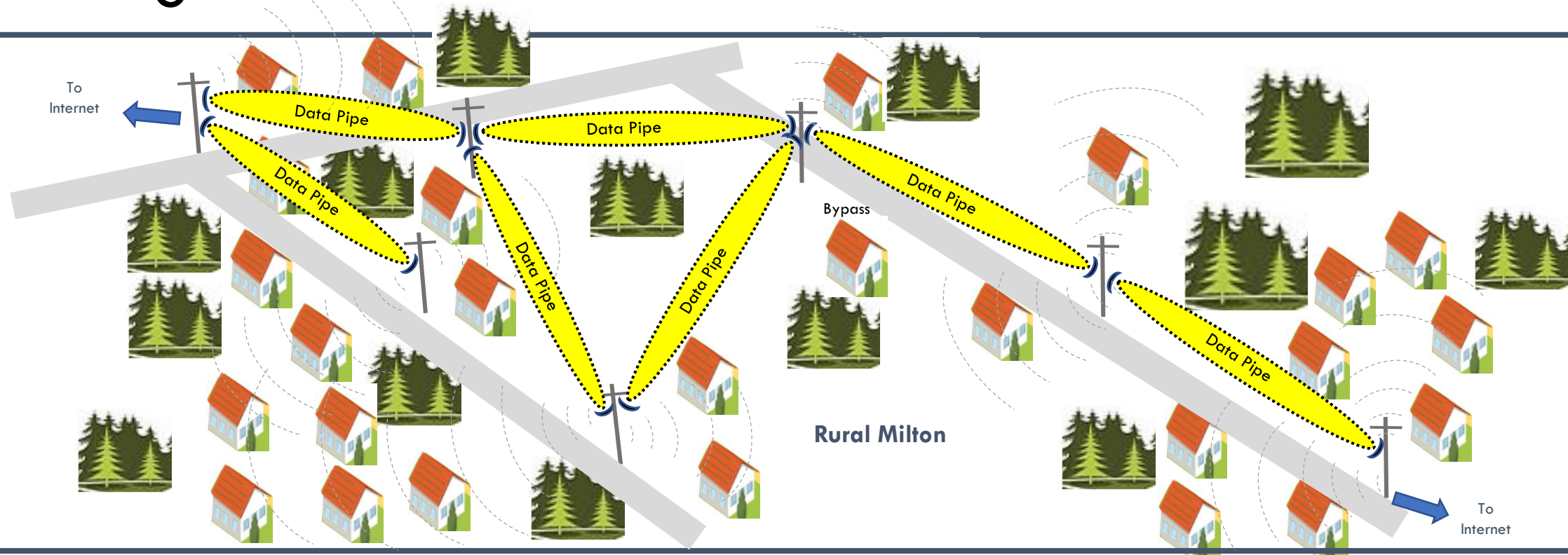
Key Strengths of Mage Networks for Residents

- Executive team have strong technology and business background
- Innovative solution for difficult terrain (rolling hills and dense tree canopy)
- Solution is well designed and can be dynamically re-engineered as network grows
- Strong business case and reasonable ROI
- Detailed installation, costing and project plan defined
- Feature their own R&D department to offer custom optimized software solutions with commercially available products
- Symmetrical speed that exceeds 50/10 requirement, up to 100Mbps
- Commitment to having a local presence support and installation team
- No new telecommunications towers required as solution uses utility poles and light standards

Rural Ontario Community Experience

- Most experience so far is in rural Alberta
- Aggressive plans to expand throughout rural Ontario

Extending Broadband for Rural Milton



✓ New Meshed Technology for Dense Tree Areas

- Works well for dense tree residential application

✓ Meshed Traffic Routing for High Throughput

- High-bandwidth, fixed-wireless, meshed radio network

✓ Automatic Load-sharing

- High availability to maximum bandwidth
- Excellent user experience

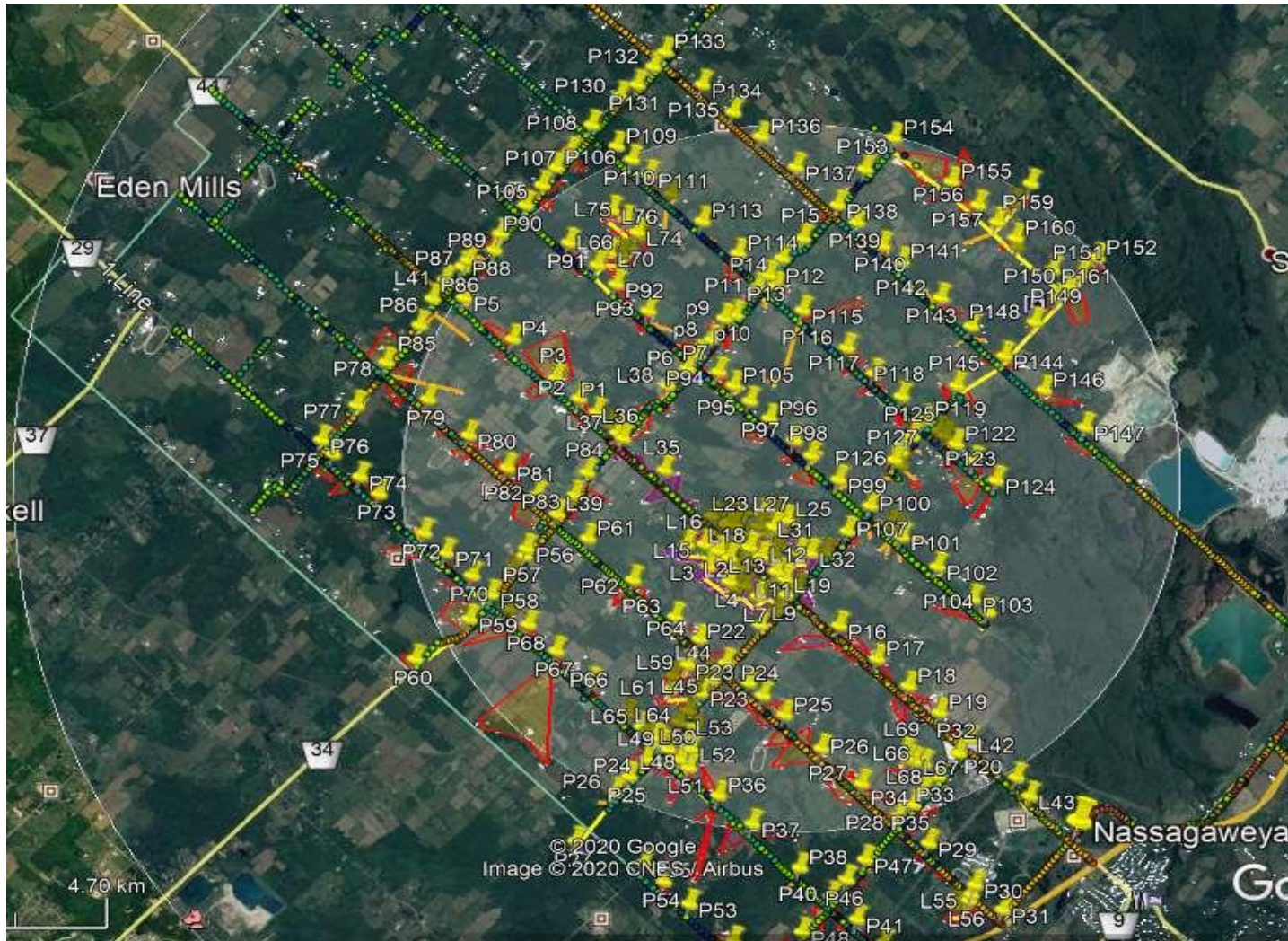
✓ Symmetrical Data Capacity

- High performance video conferencing
- Fast picture or image uploading

Business Case Innovation

- ✓ **Data Pipelines eliminate the need for New Towers**
 - In this network, it eliminates the need for up to 7 new towers
- ✓ **Solution is at least 60% cheaper than Equivalent Fibre Installation**
- ✓ **Improved Access to Customers that other Technologies Cannot Reach**
 - Reaching more customers through dense treed area increases ROI opportunities
- ✓ **Greater Customer Retention through Higher Network Reliability**
 - Temporary tripod installations available in emergency situations to prevent prolonged outages
 - Dual internet access points and highly meshed architecture for higher reliability
- ✓ **High Performance and No Data Caps**
 - Significant improvement over existing service with low data caps
 - Symmetrical service 100 Mbps up and down

MAGE Networks – High Level Proposed Network Design for 5km radius- Phase 1



Hydro Poles & Light Standards Proposed

- 136 Hydro poles
- 58 Light standards

Data Pipelines

- 247 Data Pipeline pairs
- 58 Outdoor R6 Routers

MAGE Networks – A Different Wireless Technology Approach



- ✓ No New Towers Required
- ✓ No Community Conflict over New Tower Sites
- ✓ No tower approval and build delays

Symmetrical Internet Access

Up



100
Mbps



Down

- ✓ Fast internet Surfing
- ✓ Great Multiple Concurrent Video Call Performance
- ✓ Very Fast Picture Upload Speeds



- ✓ Automatic load sharing for optimal performance
- ✓ Highly meshed design offers backup routes
- ✓ Redundant internet backhaul design



- ✓ Guaranteed Minimum Service Levels
- ✓ Multiple Access Service Plans
- ✓ Local Service & Support

Technology Innovation



Very versatile in heavily wooded, hills and valleys environments where traditional wireless is challenged

- Using short, high-capacity 60 GHz data pipes to create a mesh network



Flexible Light-weight equipment, mounted on hydro and light poles



Robust system that can recover from emergencies very quickly

- A pole can be temporarily replaced with a tripod & have it running in hours



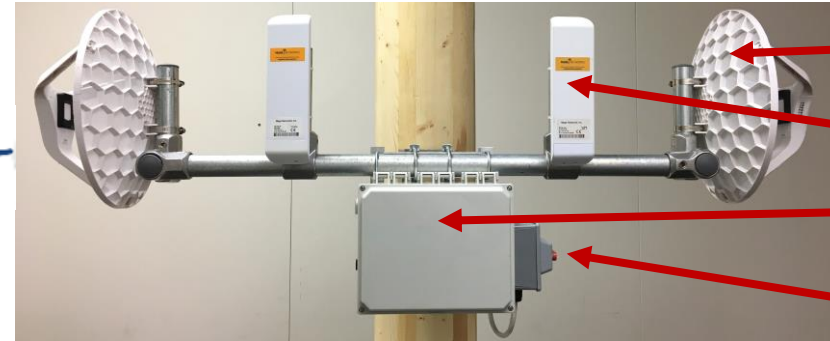
Devices are mounted only where needed

- Avoids wastage of resources
- Skip multiple poles if no customers in-between

Pole Mounted - Data Pipeline Designs



Hydro pole installation design



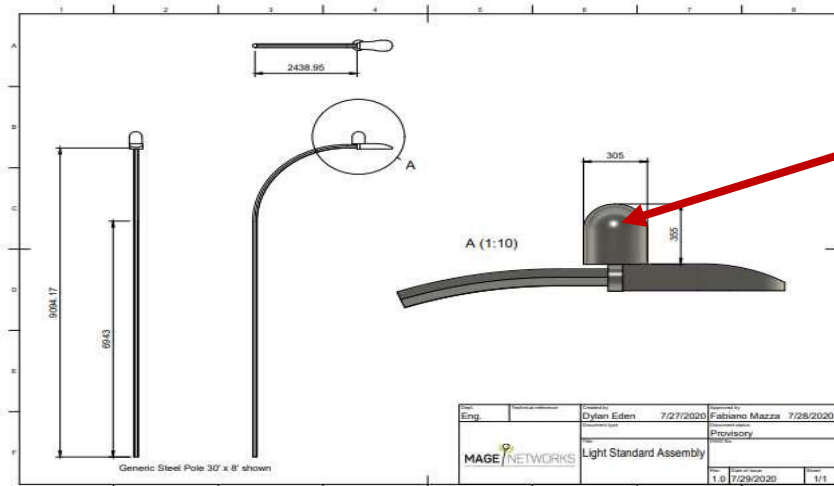
Hydro pole installation design

60GHz Data Pipe End Point

5GHz WiFi Access Point

R6 Router

Power supply



Light standards installation design with a dome shaped antenna

Compact dome shaped antenna



Temporary installation on a Tripod

Community Benefits of Project



High-speed Reliable Broadband Internet Services to Underserved Residents

- Fixed wireless access to the home (Network capacity can be easily increased as required)
- **No data cap!!** Low monthly internet access charges.



Symmetrical Wireless Internet Access for Residents

- Excellent solution when multiple concurrent video conferences required per household
- COVID-19 Ready solution for working from home, learning from home



Technology solution could be extended to the other nearby communities easily

- Significantly reduced incremental cost per community (eg. wider rural Milton, or rural Burlington)



No New Telecommunications Towers Required in Rural Milton for this Network

- Eliminates community conflict regarding new tower sites



Rapid Network Rollout and Customer Hookup

- Installation on hydro or lamp poles can be done at any time of the year
- Fast rollout possible since no delay waiting for tower builds

Overall Impact of the Project



High-speed Reliable Broadband FWA Internet Services to Underserved Residents

- Current project FWA home access to up to 300 homes (within 5km radius)
- Potential expansion to over 900 homes (within a 10km radius)



Reliable Wireless Service in Difficult Geography

- Wireless access across rolling hills of farmland and moderate tree cover



Potential Spin-Off Projects for other parts of Halton Region

- Many other nearby rural areas could benefit from the design approach used for rural Milton.



300% Business Growth Opportunities for Mage Networks in the Halton Region

- Opportunity for further expansion in rural-Milton, and rural Burlington areas
- Same technology solution would also be a great solution in other nearby counties

Contacts for More Information

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THANK YOU!