Sturgeon County and Town of Morinville Broadband Analysis:
A Collaborative Approach to Understanding Business Needs of the Broadband Network

IBI

July 9, 2018
Presentation to Council

Sturgeon County

1. Overview and Scope

2. Current State of Broadband

3. Surveys and Speed Testing

4. Stakeholder Interviews and Workshops

5. System Gaps, Expansion and Funding

6. Economic Development Analysis

7. Recommendations

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- Analyze the **current state of broadband infrastructure** and services

- Identify **existing gaps** based on stakeholder requirements

- Potential **models, rights of way, costs and funding sources** for future network augmentation

- Identify **economic development impacts** of improved broadband services

- Develop **recommendations and long-term action plan**

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- Shaw has limited presence outside of the Towns

- Broadband is mostly delivered by fixed wireless services providers (relies on radio towers and systems) and TELUS

- Fixed wireless services experience limited capacity and service degradations/interruptions due to weather and environmental factors

- TELUS broadband services are generally very limited in availability unless businesses have made unique arrangements for DSL or fibre optic cabling

- TELUS is generally focused on residential developments within the County rather than in the industrial parks

- Mobile wireless providers offer 3G and LTE with ubiquitous coverage but have data limitations and overage charges

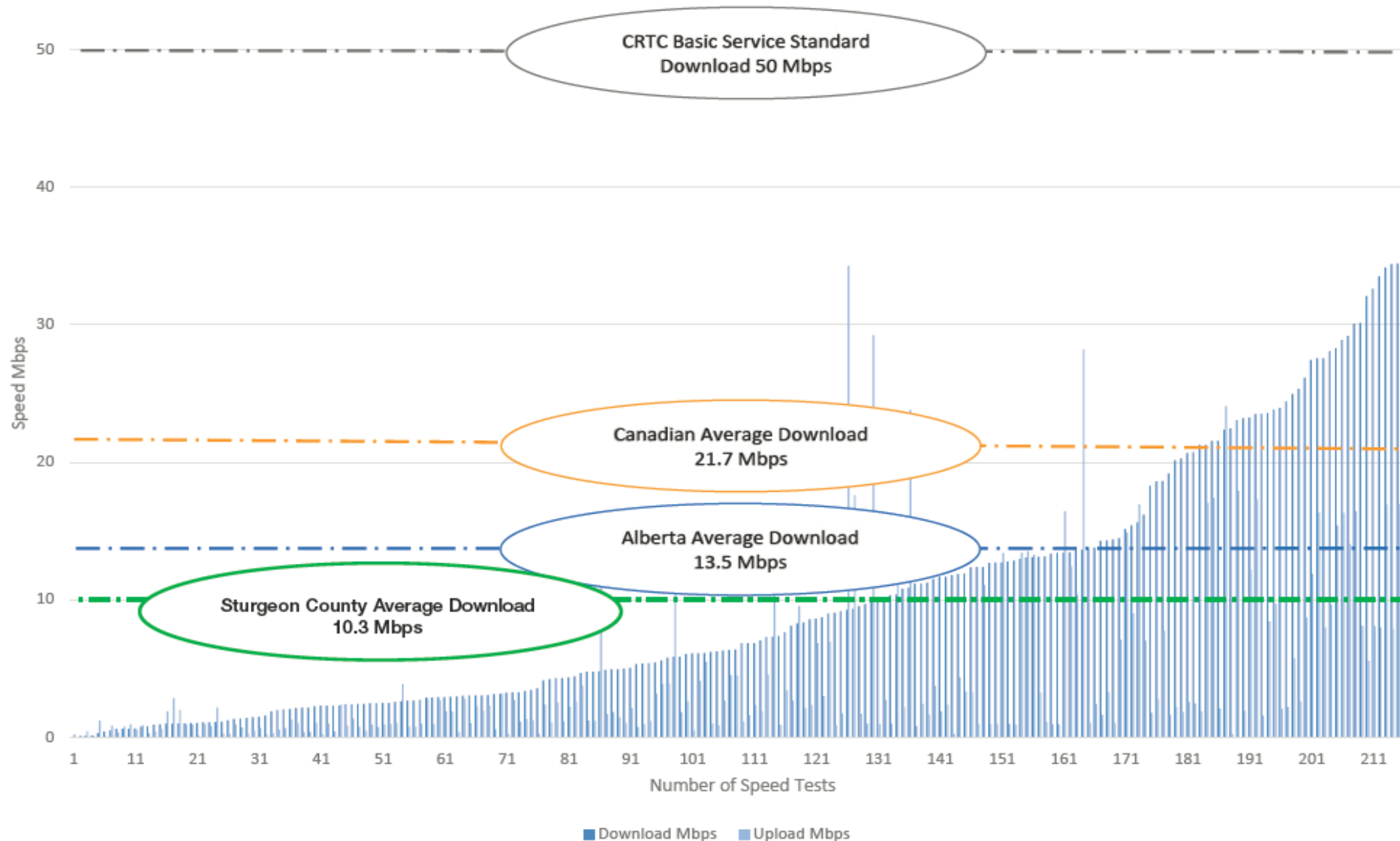**IBI Group**
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Agenda

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Key Findings

1. Average download speeds

   o Town of Morinville: 11.1 Mb/s

   o Sturgeon County: 10.3 Mb/s

	Average Download Speeds
CRTC Standard	50 Mb/s
Canada	21.7 Mb/s
Alberta	13.5 Mb/s
Town of Morinville	11.1 Mb/s
Sturgeon County	10.3 Mb/s

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Key Findings

2.

CRTC Basic Service Standard
Download 50 Mbps

Canadian Average Download
21.7 Mbps

Alberta Average Download
13.5 Mbps

Sturgeon County Average Download
10.3 Mbps

Speed Mbps

Number of Speed Tests

■ Download Mbps   ■ Upload Mbps

9

Key Findings

3. Sturgeon County: high reliance on wireless services (fixed, satellite and mobile) with 68% of respondents using wireless

   Town of Morinville: higher percentage of wired services compared to Sturgeon County

4. According to respondents surveyed:

   - Affordable internet services is important to businesses

   - 50% of them are home-based businesses

   - They are willing to pay $100 – $150/month for better broadband

5. Respondents' view on the County and Town's role:

   - 85% feel that the County and Town should have moderate to proactive involvement

   - The County and Town should ensure that future broadband requirements can be provided at a reasonable cost

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Stakeholder Feedback

- Improved broadband would enable businesses to:

    o Utilize cloud services, online accounting software and video services

    o Quickly send and receive files to improve productivity

- High speed broadband is an essential service for most businesses and plays a role in businesses attraction and retention

- Most businesses cannot afford to install fibre optic broadband services to their location ($20,000 – $100,000)

- Businesses that paid for construction of broadband facilities were generally satisfied with the quality and speed of services but see value in a secondary provider.

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Stakeholder Feedback

- The County and Town should play a significant role in improving broadband services. Potential roles include:

  o Investing in broadband infrastructure to attract private ISP investments

  o Partnering with service providers

  o Establishing service standards to improve quality of broadband services delivered

  o Subsidizing construction of infrastructure

  o Establishing standards for new developments such that fibre optic infrastructure would be included by developers at the time of new construction taking place

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System Gaps

1. Majority of businesses in industrial parks are serviced by wireless technologies or legacy copper based services.

2. Wireless service providers lack fibre optic connections to their radio towers, limiting their data backhaul capabilities.

3. Businesses have been quoted unaffordable construction costs to upgrade to fibre optic technology ($20,000 – $100,000)

4. Major businesses and institutions that have a critical need have funded the construction of fibre optic services to their locations. These locations would prefer additional, redundant fibre optic connections.

5. Even though fibre optic cable has been constructed to the locations identified in #4, carriers continue to quote large construction charges for adjacent properties.

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System Gaps

3. Government of Alberta SuperNet fibre optic facilities are distributed throughout the County

   - Current policies in place from the network operator (Axia) prevents other parties from utilizing this facility

6. Incumbent carriers (TELUS, Shaw) have deployed fibre optic systems to select residential developments in the County

   - Facilities are limited and prioritized for their own use

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Rights of Way Alternatives for Expansion

- o Use of public roadway allowances

- o Potential use of electric utility pole structures

- o Limited potential to use pipelines and water utilities

Costs of Expansion

	Fibre Optic Backbone (Note 1)	Fibre Optic Connections to Business/ Industrial Park Lots	Total Cost per Business/ Industrial Lot
Sturgeon County	$6.5M - $15.6M (Note 2)	1.8M	$8,610 - $18,397 (Note 2)
Town of Morinville	$1.17M	$0.4M	$6,110

- Note 1: This costing does not assume the utilization of existing Alberta Government SuperNet fibre optic infrastructure. Should that infrastructure be made available, costs could be reduced by up to 30%

- Note 2: Cost ranges represent the possible use of existing electrical pole structures, if feasible, as an alternative to underground construction.
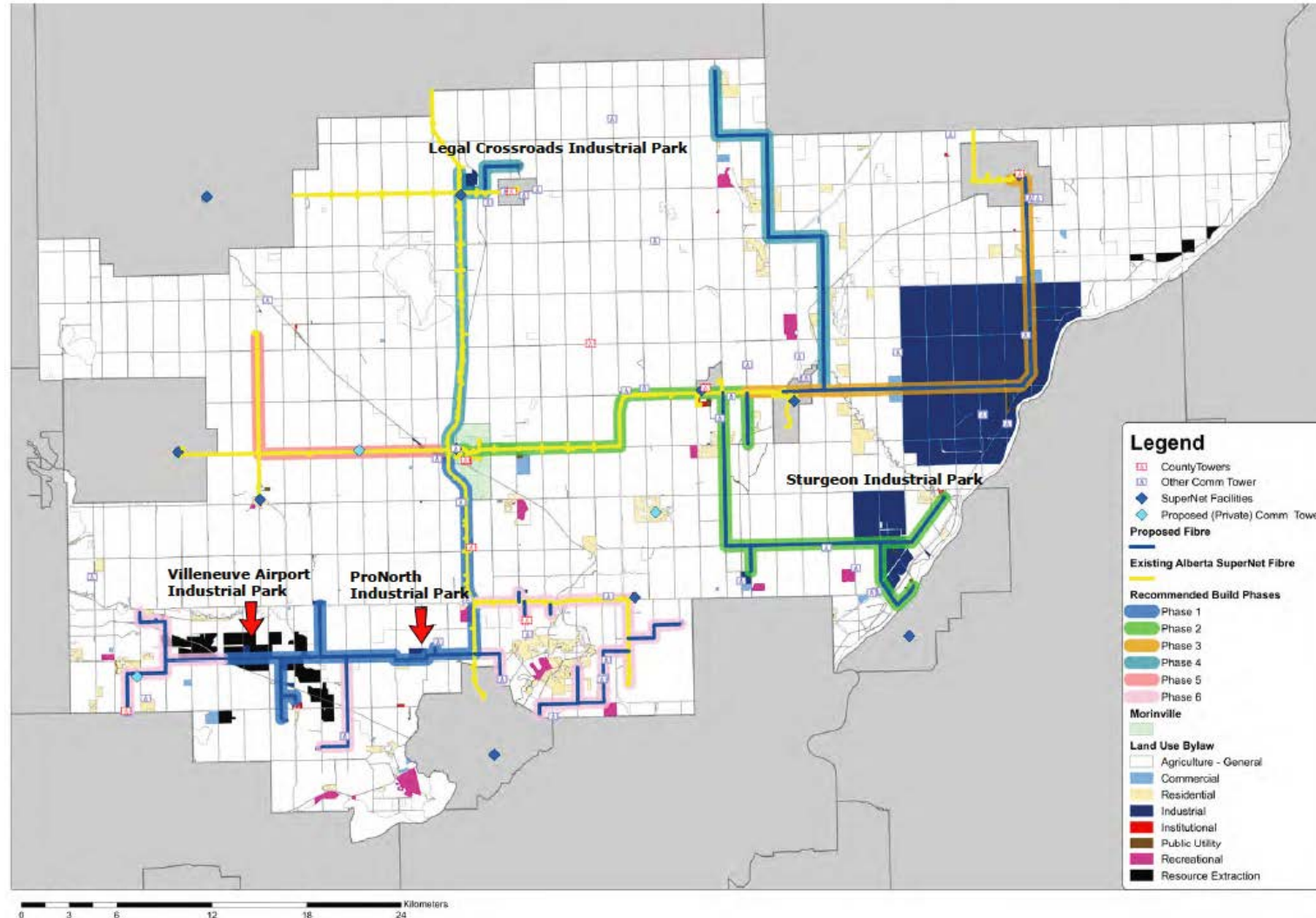
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Broadband Fibre Network – Option 1 (SuperNet Fibre not used)
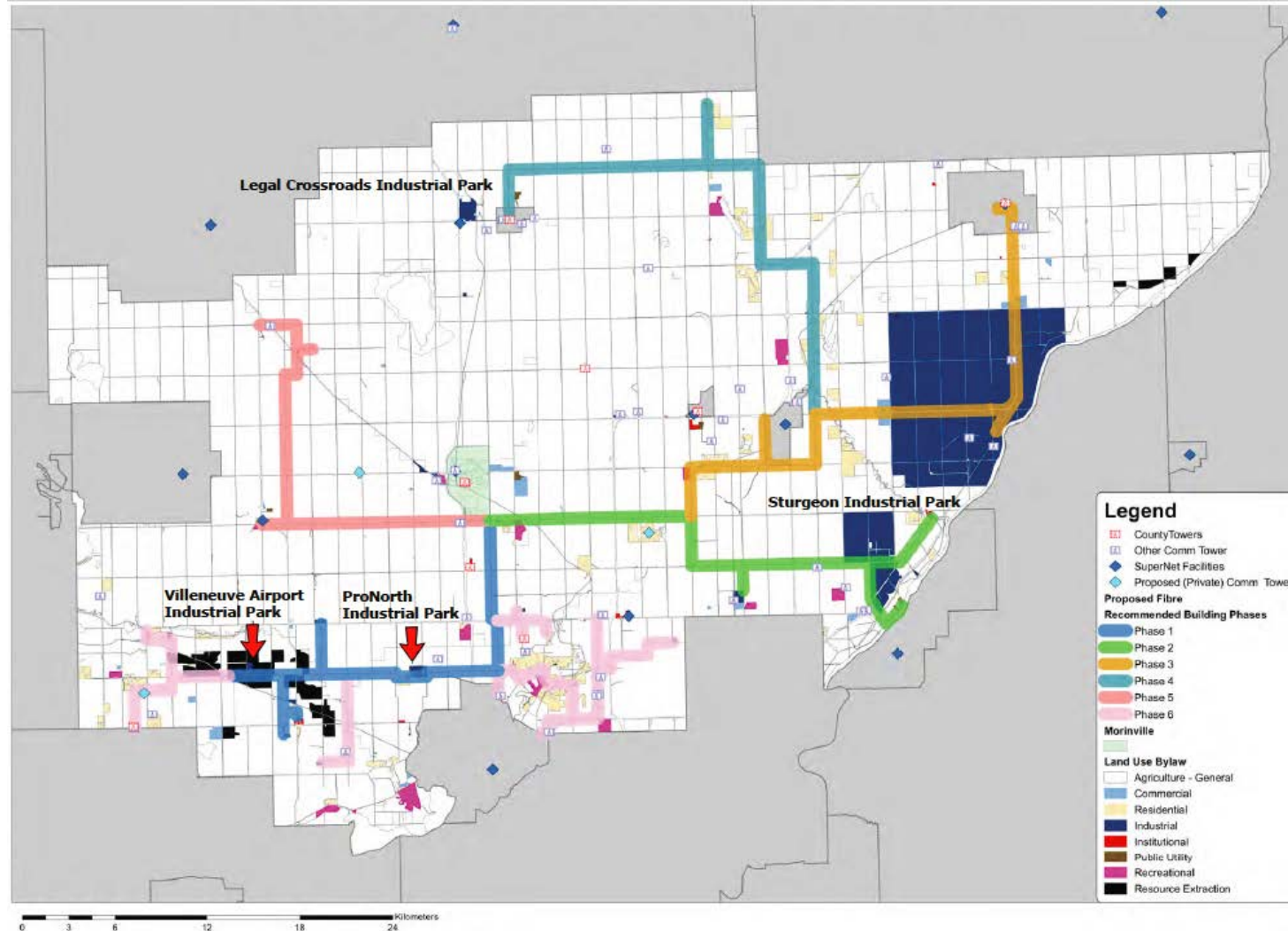
Broadband Fibre Network – Option 2 (with SuperNet Fibre)

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High speed broadband connections are a basic requirement of all business sectors as a prerequisite to Economic Development

- The County's industrial parks have the ability to provide a range of product types and settings from lower cost base, limited-service type product to full service industrial environments

- Smaller scale businesses in the industrial parks have broadband needs that are not being met today and are searching for affordable alternatives

- Development of an Entrepreneurial Zone/ Community Innovation Hub could enable the creation of an Innovation Corridor, stretching from the mixed use areas within the Town, through to more rural Industrial Parks.

- Land use would support experimental and innovative approaches to Advanced Manufacturing/Robotics and Food Processing in the remote industrial parks while allowing the Professional, Technical and Scientific services to flourish in Town centres through video conferencing and streaming services to enhance collaboration.

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Broadband-Enabled Technologies

 Internet of Things (IoT) – a system of objects embedded with computing devices (i.e. electronics, software, sensors, etc.) that are connected through the internet to enable them to send/receive data

 Artificial Intelligence (AI) – the simulation of human intelligence processes by machines. It can give rise to the use of robotics to perform human tasks.

 Blockchain – a decentralized digital ledger in which transactions or records can be made chronologically and publically. It is a growing list of records, called blocks, which are linked and secured using cryptography.

All of these technologies require broadband as a foundation for connectivity and have the potential to influence various economic sectors in the County.

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Broadband-Enabled Technologies in the Advanced Energy Sector

IoT can revolutionize the oil and gas industry by improving operational efficiency, increasing revenue, providing real-time data, reduce safety risks, and lower the industry's environmental footprint.

AI can change safety and productivity through automation and reducing the risk of human error. It can also create new job classes and introduce new ways of managing people and performance.
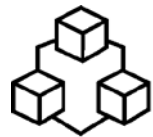
Blockchain can simplify processes to enhance efficiency and reduce costs. For example, it can offer transactional verification instantly across a network, without relying on a central authority— potentially reducing operating costs, more securely storing and managing data, and improving the speed of transaction processing.

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Broadband-Enabled Technologies in the Agricultural Sector

IoT can play a significant role in improving the quality and quantity of agricultural produce by bringing in technology and equipment which can help in better management and assessment of natural resources like water, soil, and climate.

AI can be applied to the industry through agricultural robots to handle tasks such as irrigation, weed control and harvesting crops using driverless technology.
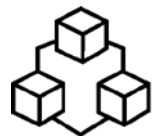
Blockchain is used in agriculture to record and update the status of crops from planting to harvest to storage to delivery. Traceability allows growers to ensure the quality of their deliveries and even manage the asset exchange, including instant payment, via the blockchain.

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Broadband-Enabled Technologies in the Manufacturing Sector

IoT sensors, switches, and intelligent controls embedded into machinery for manufacturing can capture data to help to improve operations by analyzing and optimizing processes, reduce costs, and make for a safer workplace.

AI can be used in the industry to automate manufacturing to increase accuracy and productivity. It can facilitate the use of robotics by providing capabilities like voice and image recognition to recreate complex human tasks, increasing efficiency in output, defect detection and corrective action.

Blockchain technology can be used to monitor the movement of goods throughout a supply network to reduce loss of revenue from fraud and leakage

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7. **Recommendations**

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ONGOING

1. Monitor Federal Government Grant Programs (CRTC)

Expected announcements in 2018 to define Internet as a Basic Service Fund criteria

2. Contact Canada Infrastructure Bank to understand project criteria and appropriate structure to be eligible

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2018

> **3. Engage the Alberta Government (SuperNet Secretariat) to understand status of SuperNet contract renewal**
>
> Availability of SuperNet fibre optics for Municipal use as a pilot project

> **4. Review business park and wireless tower locations for pilot program opportunity.**

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2018/2019

5. Additional public engagement

- Costs estimates

- Pilot project plans

Budget: $10,000

6. Complete preliminary design and feasibility study to construct fibre optic cable in pilot areas:

-Pro North Industrial Park (Phase 1)

-Villeneuve Airport Industrial Park (Phase 1)

Budget: $239,000

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2018/2019

> **7. Develop an RFP to solicit potential private sector partners to participate in the pilot projected**
>
> Based on the identified preliminary design, broadband standards and service levels

> **8. Select partners, confirm funding contributions**
> Budget: $25,000

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Recommended Broadband Standards

METRIC	AREA OF FOCUS	PROPOSED STANDARD (2018)	5 YEAR TARGET	10 YEAR TARGET
Average Download/ Upload Speed	• Industrial Parks	• 1/1 Gbps	• 5/5 Gbps	• 10 /10 Gbps
Average Download/ Upload Speed	• Fixed Wireless Towers along the Fibre backbone	• 1/1 Gbps	• 5/5 Gbps	• 10 /10 Gbps
Average Download/ Upload Speed	• Commercial Establishments and Institutions	• 150/30 Mbps	• 1 /1 Gbps	• 5/5 Gbps
Average Download/ Upload Speed	• All Other Areas	• 50/10 Mbps	• 150/30 Mbps	• 1/1 Gbps
Latency (North America destinations)		• Less than 100ms		
Reliability		• 99.99% service uptime with a mean time to repair (MTTR) objective of 4 hours		
Open Access to Carriers		• Yes		
% of Establishments Connected			• 100% for Industries • 60% for all other establishments	• 100%

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2019/2020

9. Secure funding, complete pilot project
Budget: $2,160,660

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2021 - 2025

Complete additional phases of fibre optic deployments
- Timing based on funding availability and business demand

2021: Phase 2
Budget: $3,181,020

2022: Phase 3
Budget: $2,984,840

2023: Phase 4
Budget: $2,622,960

2024: Phase 5
Budget: $2,014,560

2025: Phase 6
Budget: $3,778,380

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