AGORA

Smart Cities Challenge

Final Proposal

March 5, 2019

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EXECUTIVE SUMMARY

As a group of four rural counties in Alberta, we are pleased to submit our proposal to Smart Cities Canada! We believe we have risen to your Challenge.

When awarded the Challenge prize, we aim to transform how rural Canada uses and accesses Information Communications Infrastructure for the common good. We will lever the benefits of connected technologies to improve rural lives, rural economies and rural environments. We will bridge the divide with urban Canada and better connect urban residents with their sustainable food supply. We seek to create a region where internet connectivity, smart technologies, and innovative data trust applications are developed and used to increase rural prosperity and will attract citizens to an innovative and prosperous way of life.

We are about to embark on a path to tackle one of Canada's most wicked of problems:

> *Deliver decision-making tools, informed by hyper-local data and connectivity solutions, that benefit residents that, in turn, improves Canada's food production and distribution system, enhances rural safety and security, incents young families to become life-long farm operators, and, when fully implemented, increases the prosperity of rural Canada.*

The challenge is large – our plan begins the process. It delivers upon the outline submitted in the Spring of 2018, and builds upon it in significant ways. A full strategic plan, with all the supporting details demanded through this rigorous application process, defines our way forward.

We propose a not-for-profit company reflecting our rural intent – ***AGora*** – be created to bring life to our strategy.

> ***AGora*****:** an internet enabled meeting and marketplace, based on the original Greek agora where people meet, discuss, research, resolve, profit and prosper.

True to the intention of the Smart Cities Challenge, we are focussed on delivering value that can be adopted nationwide. We intend to use state of the art technologies to create *AGora* so it can be used by others. And it has not and will not be created in isolation. Collaboration underpins our achievements so far, and will be core to our long-term success. Community members and partners of all types will work with us to deliver value.

Our proposal defines a common purpose and shared approach to tackle our 'wicked problem' head on, and not wait for events to overtake rural Canada. We see a positive future for all rural regions in Canada, with connected technologies at the core.

We ask that you step forward in partnership with us to bring about a new future for Rural Canada. Something that perhaps was not contemplated when the Smart "Cities" Challenge was announced, but something that will deliver fundamental value to Canada's urban and rural residents alike.

We invite you to join us!

VISION

1. The Four-County Challenge

This proposal sustains the collective vision of Parkland, Brazeau, Lac Ste. Anne and Yellowhead counties in Alberta to create a smart rural region and describes how this will be achieved.

The proposal continues to focus on the collaborative Challenge that:

Our agricultural community will revitalize and grow through the connection of people to the land and food while attracting citizens to share in its prosperous, innovative and resilient way of life.

Our four counties envision a growing local populace that is positioned to succeed in the digital economy. Economic growth and population growth will require access to the Information and Communications Technology (ICT) economy and the decision tools required to prosper.

Our objective is to create a region where internet connectivity, smart technologies, and innovative data trust applications are developed and used to create a more prosperous agricultural economy, protect and improve the environment, enhance rural quality of life, increase safety and security, and provide leading-edge connectivity for our farms and citizens.

Rural Economy

The initiative will create a rural economy where opportunities expand, stronger links to urban markets support and diversify the economy, smaller farms are more viable, larger farms use precision agriculture to improve productivity and increase profitability, and increased opportunity and prosperity enable intergenerational farm transfer.

Rural Environment

The initiative will enable decisions that protect and improve the environment and husband the region's natural assets and land base. This includes identifying new end-uses for waste that is now being landfilled, efficient use of agricultural/residential by-products and green energy opportunities.

Rural Quality of Life

The initiative will enhance rural quality of life by creating communities with a more diverse age demographic, helping smaller farms to establish and prosper, increasing agricultural diversity, attracting residents with different social and economic interests, expanding the tax base to upgrade infrastructure, and increasing mental health as incomes grow and financial challenges are eased.

Rural Safety and Security

The initiative will make the region safer and more secure by improving road safety, reducing the incidence and severity of rural crime, and improving response times for law enforcement.

Rural Connectivity, Dataflow, and Data Trust

The initiative will provide leading-edge connectivity, where technology enables people to live further from urban centres, obtain equitable service, and derive more value from the agricultural data it produces, via a secure and fully auditable data exchange and trading platform.

Data protection has emerged as a factor critical to the long-term prosperity of communities. Data is the new enterprise currency – the ability to collect, analyze and lever it for the benefit of the data provider will distinguish one enterprise from another. This is no less so in the agricultural sector. Deriving value from this 'second crop' will be achieved by combining a single piece of data with other data and then generating more data – an evergreen crop. This virtuous cycle will help solve real-world farm management problems, provide new revenue sources and identify and solve community problems quickly and easily.

2. The Proposed *AGora*

We are proposing to incorporate a not-for-profit organization that will act as a rural innovation incubator, bringing together partners from all sectors to catalyze early adoption and use of high-speed internet communications, smart technologies, and innovative internet applications.

We are calling this new entity *AGora.*

AGora will establish the infrastructure required to provide a test platform for:

- Experimenting with new technologies and models for rural internet connectivity
- Supporting innovation in agricultural technology and agricultural practices
- Creating new applications that support rural citizens, communities, and businesses
- Protecting and monetizing data through new technologies on behalf of data producers

AGora will:

- Establish a data trust to ensure control and sovereignty of the data assets
- Deliver hyper-local data and analytics to provide value and incent participation
- Recruit an initial cohort of farmers, local businesses and rural farm-based businesses who will commit to provide their operations as a test bed for technology development and continuous improvement, and will provide high-speed connectivity for these early adopters
- Recruit technology developers who will benefit from and are willing to pay for access to these early adopters help create new technologies on highly-connected farms
- Use revenues from this 'pay-to-play' model to extend connectivity to others in the region

Through its activities, *AGora* will:

- Develop an affordable model for rural digital connectivity that can be replicated in other rural regions
- Develop made-in-Canada innovations in smart agricultural technology
- Accelerate adoption of new agricultural practices that improve farm productivity and profitability
- Catalyze development of internet-based applications that enrich rural life
- Improve urban Canada's understanding of its food production and security system
- Establish data as a 'second crop' for farmers that is renewable, expandable and profitable

Data will be *AGora's* stock-in-trade. It is the critical focus of every product and service supported by *AGora*, which will provide content that is the most relevant, timely and valuable for regional agricultural producers and other clients. This focus on data will help *AGora* and its clients capitalize on these rich and comprehensive data resources that many commercial enterprises already exploit. Increasingly, agriculture producers and the broader population are coming to understand they have been supplying these and other private enterprises with useful and marketable data, with virtually no direct return. *AGora's* efforts to cultivate leadership in rural innovation will focus on improving digital and data literacy throughout the region and will build *AGora* and client capacities for data discovery, data science, data marketing, data brokering, and other profitable functions related to the lucrative and expanding global data economy.

3. Meeting Real Community Needs

3.1. Community Consultation and Engagement

This initiative will create outcomes that are highly relevant for the four-county region and its residents. These outcomes represent real community needs that have been refined through extensive consultation and engagement. The processes used to develop our vision and prepare this implementation plan are described in the ENGAGEMENT chapter.

3.2. Supporting Evidence

There is significant supporting evidence for the relevance of our key strategic objectives and the benefits of addressing this Challenge.

Rural Economy

Farms are getting larger, numbers are dwindling, and wealth is accumulating in the largest. In Alberta, the average age of farm operators increased from 48.2 years in 1996 to 55.7 in 2016. It is more difficult for young people to enter the agriculture business and to stay in business; farms are expanding instead of diversifying.

Where able, rural residents are enthusiastic adopters of new technology. Farmers always have had to figure out how best to market their products. Today, 12.7% of Canadian farms use direct marketing tools to access markets. This is more the case for small farms than large - 25.2% of farms with sales less than $10,000 use direct marketing, compared with 5.6% of farms with $1 million or more. Small farms rely on direct marketing, on-line presence, and ability to reach the 'farm-to-fork' audience.

Larger farms are becoming equally dependent on technology. Precision agriculture is data intensive and requires high-bandwidth connectivity. A futurefarming.com survey – "Internet speed hinders farm technology use in Canada" – found 93% of respondents felt precision agriculture was useful; three-quarters plan to expand their use of the technology in the future. However, according to the report, the biggest barrier to further technology adoption, after price, is internet infrastructure.

Rural Environment

Soil erosion is a significant challenge that is costing Canadian farmers more than $3 billion a year, notwithstanding the efforts that have been made in soil conservation. University of Manitoba professor David Lobb says in 1971 farmers lost $0.96 billion in 2016 dollars every year due to soil erosion. In 2011, he says, this had increased to $3.18 billion, resulting in cumulative losses of between $40 billion and $60 billion. [“Cost of soil erosion $3 billion annually in Canada.” Chatham this Week. Tom Morrison. Feb 20, 2018.]

Continuous cropping and the use of agrochemicals have increased crop yields but also may impact long-term sustainability. Increased availability of hyper-local data coupled with improved data-mining and artificial intelligence will enhance each farmer’s ability to make responsible decisions by better understanding of environmental processes at various scales, improving land stewardship.

Rural Community and Quality of Life

In its 2017 report titled Rural Broadband: *Policy Recommendations for Improving Broadband Access & Adoption in Rural Alberta*, the Alberta Centre for Sustainable Communities at the University of Alberta advocated that “broadband should be considered a priority for community development and an important space for interaction and innovation.”

A paper published in American Behavioral Scientist in 2010 summarized research indicating that internet usage can increase voluntary participation and create social networks in rural communities, building social capital. (“Do Rural Residents Really Use the Internet to Build Social Capital? An Empirical Investigation.” Michael J. Stern and Alison E. Adams. American Behavioral Scientist. 53(9) 1389–1422.)

The authors assessed how residents in an isolated rural region of the western United States used online connections to maintain local social networks and learn about community events and organizations. They concluded Internet usage can play an important role in strengthening rural communities. Residents used the Internet both to learn about local events and groups (bonding) and to connect to interests outside the local area (bridging).

Rural Safety and Security

Farms (and municipalities) are using larger and more advanced equipment. Their size and speed make them a hazard on public roads. As rural road traffic increases so does the accident rate. A 2016 study – "The effects of roadway characteristics on farm equipment crashes: a geographic information systems approach” – in the Journal of Epidemiology confirmed that "As traffic volume increased, the odds of a crash occurring also increased. Higher traffic volume, higher posted speed limits, road type, and smaller road widths were associated with the occurrence of farm equipment crashes."

Rural crime also is a growing problem. Western Canada has higher rural crime rates than the national average. Alberta, with 9,895 offenses per 100,000 residents, places third in the west. The Provincial Caucus on Crime Reduction in Saskatchewan (2017) reported that “there has been a relocation of… traditionally urban crime to increasingly rural areas. The result is that drugs, gangs and violent crime are more prevalent in rural parts of the Province.” Rural residents feel criminals are becoming more brazen, better organized, and more brutal.

Rural Connectivity

Canada has recognized the importance of nationally available broadband. The CRTC has confirmed that, notwithstanding significant improvements, "many Canadians, particularly in rural and remote areas, do not have access to broadband Internet access services that are comparable to those offered to the vast majority of Canadians in terms of speed, capacity, quality, and price." In its Telecom Policy 2016-496, the CRTC said it "expects fixed broadband Internet access services... to be available in 90% of Canadian premises by the end of 2021, and in the remaining 10% of Canadian premises within 10 to 15 years. In communities where distance, geography, and limitations to existing technologies present challenges, the Commission expects that intermediate steps will be taken to progress towards these goals."

Service in our four regions is currently spotty and irregular. In a survey conducted for this project 93% of respondents rated cellular coverage as average-to-poor; 77.3% rated internet coverage as average-to-poor. Moreover, as part of this project Taylor Warwick confirmed that fully $100.7M would be required to implement traditional connectivity across the four counties on par with urban Canada.

Meaningful Data Creation and Use

Smart farming relies on new technologies like the Internet of Things, cloud computing, robotics, and artificial intelligence. Massive volumes of data are captured, analyzed, and used for decision-making. The global data economy is pegged at $3 trillion - a rising trend that also is evident in agriculture.

Climate Corporation's Chief Science Officer estimates 70% of agricultural yield is related to what to plant, how to fertilize, and how to protect the crop. According to equipment manufacturer John Deere, self-guided systems now farm approximately 60% to 70% of the crop acreage in North America, 30% to 50% in Europe, and more than 90% in Australia.

Monsanto paid nearly $1 billion dollars to acquire The Climate Corporation in 2013. There is a growing global market for tools that use Big Data to produce actionable insights.

In "A future internet collaboration platform for safe and healthy food from farm to fork" [Global Conference (SRII), 2014 Annual SRII, IEEE, San Jose, CA, USA (2014), pp. 266-273], Sjaak Wolfert and his co-authors identified five main challenges:

- Handling increasingly large amounts of data from all kinds of agricultural equipment
- Establishing interoperability between various systems at farm level and in the whole supply chain network surrounding the farm
- Standardizing data
- Going beyond the small scale and regional focus of farm software development
- Complying with national and regional differences in farming practices

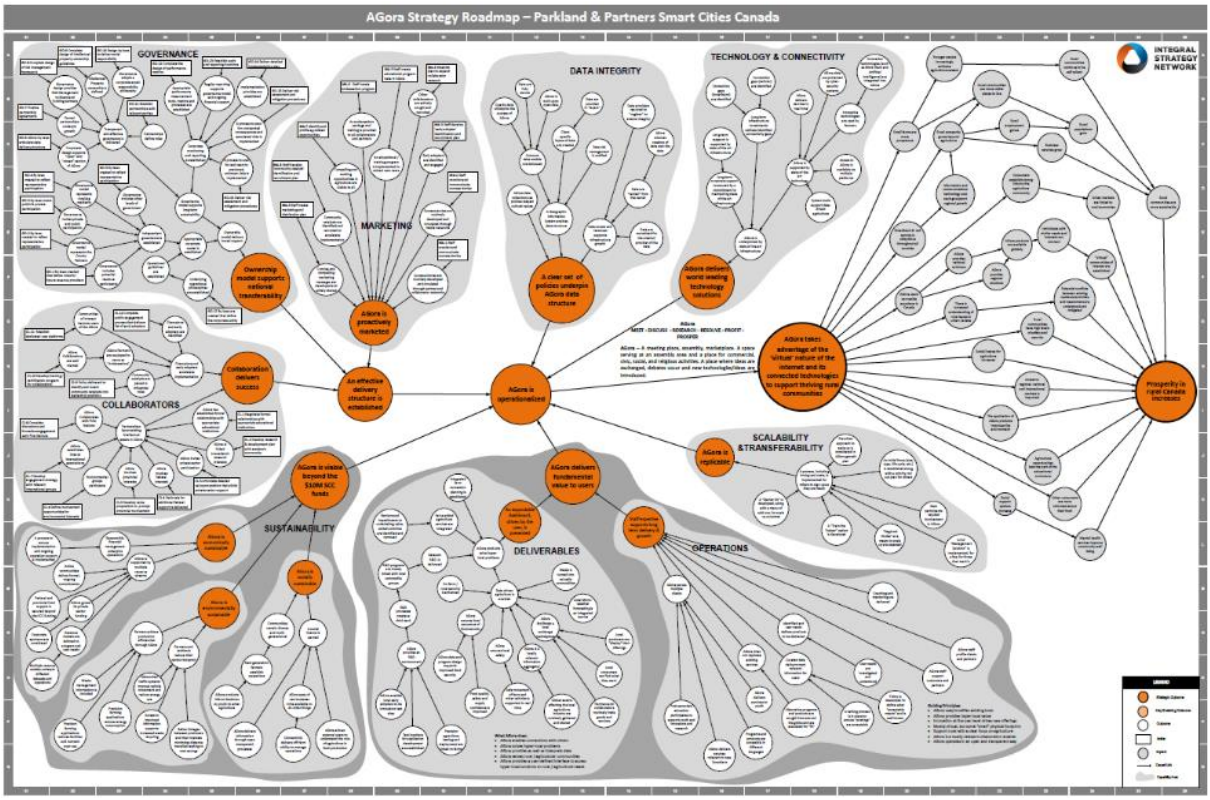
Beside business players, many public institutions are promoting Big Data applications in farming by advocating for open data and data-driven innovation. Examples include the Big Data Coalition, Open Agriculture Data Alliance (OADA), and AgGateway. The US Department of Agriculture wants to use data created by connected farming equipment, drones, and satellites to enable precision agriculture for food security and sustainability.

4. Sustained Progress During the Finalist Phase

The region commissioned an assessment of current communications infrastructure in the four counties during this finalist phase. This provided additional detailed information describing the quality of service, gaps in service provided, and the investment required to meet CRTC service standards. This will provide essential baseline information for setting priorities and developing an infrastructure strategy that will evolve to support this initiative.

Substantial progress also has been made to secure community participation and support. The Integral Strategy™ Roadmap development process involved key community stakeholders who have committed their continuing involvement to move this initiative forward. It has received broad support from other key stakeholders and potential partners, including all cities and towns in the region.

The design process we used focused on results. Collective intentions are described in the Strategy Roadmap we created. The map defines a clear strategic goal, the actions and outcomes required to achieve it, and ensuing benefits. It provides an ongoing framework for disciplined implementation, including priority-setting, assignment of accountability, risk management and performance measurement linked to key outcomes.



Major themes describe requirements to establish *AGora* (governance, collaborators and marketing); creating user value (deliverables and operations); delivering leading technology solutions (technology and connectivity); stewarding data assets (data integrity); ensuring *AGora's* continuing viability (sustainability); and replicating the innovations in other rural regions (scalability and transferability). **The Roadmap delivered the framework used to develop the strategy described in this proposal. (http://integralstrategy.net/wp-content/uploads/2019/03/ParklandStrategyRoadmap.pdf)**

5. An Ambitious and Achievable Challenge

This is an ambitious initiative aimed at:

- Providing a new and trusted Canadian platform for innovation
- Incenting technology development and commercialization
- Enlisting early adopters to test promising new technologies
- Identifying opportunities to increase productivity and profitability in agriculture
- Strengthening rural communities, farms and businesses
- Delivering new models and technologies to enable rural connectivity

The outcomes are well aligned with the objective of the Smart Cities Challenge to improve the lives of residents in Canadian communities through innovation, data and connected technology. The initiative will improve the quality of life in rural communities and will encourage the next generation of Canadian farmers to continue farming without being disadvantaged by this lifestyle choice.

Notwithstanding the scope of this Challenge, we are committed to achieving it, following a disciplined approach. Objectives will be achieved through strong partnerships, broad community collaboration, sustained commitment over time, and the use of artificial intelligence and distributed technologies to protect the intellectual property of participants.

6. Guiding Principles

AGora will adopt the following principles as the base for corporate operation and growth. They speak to the values of the organization and will guide decision making and setting business priorities.

Our conduct is honest, ethical, and responsible

AGora will not only meet all applicable legal and regulatory requirements, it will operate in a clear, open, and transparent manner in support of the rural and agricultural sector.

Value is created through partnerships

AGora will seek to create greater value through partnerships, recognizing that partners bring unique strengths to initiatives that increase their likelihood of success.

Data ownership delivers value

AGora recognizes that data has become the new enterprise currency and should deliver value for its creators, curators, and users.

Growth and innovation opportunities exist

AGora will pursue opportunities for growth and innovation, recognizing that rural economies and agriculture will benefit from capitalizing on these opportunities.

Successful development is based on knowledge, innovation and growth

AGora is committed to catalyzing innovation in Canada that meets the needs of a rural economy and agricultural base that seeks to remain competitive, diversify and grow.

Equitable access is fundamental to future opportunity

AGora will strive to deliver region-wide access to connectivity that is competitive with that in urban areas and transferrable to other rural communities across Canada.

First Nation involvement supports success

AGora recognizes that reconciliation and strong, sustainable communities will be achieved through long term engagement with First Nations and being respectful stewards of the lands we all reside on.

Customer service is key

AGora recognizes that its success depends on sustaining a culture that embraces excellence, integrity, accountability, and service to all clients in the four counties and beyond.

Data sovereignty and data trust are paramount

AGora recognizes the importance in the post-Cambridge Analytica era of deploying technology solutions that create a fair balance of power and control between those who produce the data (citizens and farmers) and those who manage the infrastructure or processes and use the data.

7. A Model that is Transferable, Replicable, and Scalable

It is a long-term objective of the Smart Cities Challenge that the investment Canada makes in this region can be replicated, modelled and transferred to other areas of the nation. Canada has advised that the funding provided should enable full national roll-out. *AGora* will demonstrate national scalability, transferability and replicability, anticipating that funding for implementation will come through other avenues.

The Organizational Model

The not-for-profit model used to establish and govern *AGora* will provide full financial accountability and transparency. Details of the model will be fully available to other rural regions that wish to participate with or emulate its services and design. In much the same way that this project leaned on the good works of existing entities like TECTERRA to help with key design elements, *AGora* will provide similar support to other interested parties.

Connectivity Solutions

Rural Canada is disadvantaged by poor internet access and speed compared to that enjoyed in urban areas. *AGora* will conduct pilot projects to determine how existing infrastructure can be twinned with new communications technologies to fundamentally re-structure ICT deployment and service delivery in rural areas and will assess the feasibility of achieving target service levels identified by the CRTC.

The 4 Counties have been broadband leaders since 2009, and have created some of the largest municipally owned infrastructure projects in Western Canada. They continually share best practices.

The *AGora* Platform

AGora's technology platform will be a web based, GIS enabled, Data Trust platform. It will be designed and architected to transfer, scale and extend to other geographic areas. The platform will enable data analytics, host applications and protect data through the Data Trust. *AGora* will create a feature rich library of products and services focused on solving hyper-local Agricultural problems.

Commercialization of Innovations

We contemplate a long-term and healthy relationship with the private sector. Private sector participation is critical to bring state-of-the-art technologies, broader skills and diverse applications to rural innovation. We expect many of the tools that are developed in *AGora* will be patented and commercialized through private sector participation. National and international replication and dissemination will take place through assertive profit-oriented companies.

An Innovation Transfer Program

AGora will establish a program to transfer innovations created in this region to other rural communities. This will include experience with its structure and governance model, values, operating principles, partnering approach, and community engagement processes. It will seek to establish relationships with other communities.

Extension to Other Rural Sectors

This proposal will create benefits for the agriculture sector and population in the four counties. The region also includes mining, oil and gas, tourism, and forestry. Implementation will improve connectivity and will create a model and technology enablement that can be extended to other sectors. Ultimately, this could include all sectors of Canada's rural economy throughout the country.

Ongoing Assessment

AGora will include ongoing assessment of the effectiveness of these approaches, to improve them and identify new opportunities to transfer findings from *AGora* to other regions. Its AI-backed and secure performance management systems will allow both project benefits and wider economic and social multipliers to be tracked and reported on.

8. Reasons to Select Our Proposal

Our proposal is strong in a number of essential respects – location, enabling conditions, technology design, and the rigor of our approach.

8.1. Location

The region represented by our four counties is ideally suited for this initiative. The site is a natural test bed to prove and develop solutions that can be deployed in other rural regions:

- There is a wide range of agricultural products, processing, and global marketing efforts in the region, and a small investment would deliver significant innovation, economic and public benefits
- Key rural economies are represented: forestry, oil and gas, mining and tourism

- Agriculture is diverse, ranging in size from large to small, including farms and ranches, and profitable and less profitable operations
- Connectivity is highly varied, with many dark spots
- The terrain presents a variety of communication challenges

The region also is close to a major urban centre – Edmonton. This proximity offers:

- A connection point for high-speed internet access
- Recognized leaders in artificial intelligence (leading city for pan-Canadian artificial intelligence strategy)
- Opportunities to establish creative agri-food partnerships for technology innovation
- A test bed to develop new rural-urban connections and market opportunities

8.2. Enabling Conditions

The following conditions support delivery and adoption.

Local Farmers are Aware of the Need for Change

Farmers are increasingly aware of data-driven agriculture, and the impact this will have on their lives, their ability to make decisions, and the way in which they produce, transport, and sell their goods.

Some Connectivity Already is in Place

A base level of connectivity exists in some parts of the region. This provides a base to build from. In the first phase of implementation *AGora* will seek to connect early adopters.

There is a Global need for Innovation in Agriculture

In expert hands, data is intelligence. Hyper-local data is a valuable resource for planning and decision-making. It enables innovation in food production and security, transportation, and waste management. It supports applications that improve farm productivity and profitability.

Progress is Being Made in Data-Driven Farming

Agriculture focused companies are developing increasingly complex and data hungry systems to support farm/crop and livestock operations. Many are seeking the next generation of improvements based on hyper-local data that enables a site-specific response.

Partners Have Come Forward

We have sought and confirmed interest from potential private sector and academic partners. These partners will enable initiatives across the full research, development, and commercialization spectrum. More work will be done in the first phase of implementation to confirm roles, responsibilities and funding, but a base is already in place. Partners are willing to bring matching money to the table.

Early Adopters Have Been Identified

Early adopter farmers and businesses have been identified. Eighteen farmers and business leaders from the four counties have agreed in principle to participate. More work will be done in the first phase of implementation to select those who are most capable, best located, and most appropriate for the initial development projects.

Technology Design

Deployment of *AGora's* digital data trust platform will deliver a data exchange system that enables control and sovereignty of data assets. This will help data producers and consumers reap the rewards and value from these data assets, create a pipeline of next-generation products and services, broaden job opportunities, and accelerate economic prosperity and inclusion, while solving real-world farm management and community problems.

8.3. The Rigor of Our Approach

The stakeholder engagement, strategic design process, and definition of an outcome-focused roadmap for implementation, has been fundamental to our approach. This delivers a plan that can be implemented across organization, system, sector and community boundaries. Through the participation of key stakeholders, the strategic direction for collective action to address the following "wicked problem" has been developed:

> *Deliver decision-making tools, informed by hyper-local data and connectivity solutions, that benefit residents that, in turn, improves Canada's food production and distribution system, enhances rural safety and security, incents young families to become life-long farm operators, and, when fully implemented, increases the prosperity of rural Canada.*

Our proposal defines a common purpose, including contributions from diverse stakeholders, the corporate structure needed to deliver this strategy, a clear path forward based on specific deliverables and outcome, and a method to link costs to the desired outcomes. We undertook three parallel initiatives in this phase of work to confirm existing connectivity in the region and an infrastructure strategy to move forward; further detailing of the family of products, partnerships, and services to be established under *AGora's* innovation mandate; and ongoing public engagement to identify priority needs and public interest in the work to follow.

When brought together this delivered an integrated plan to create the structure, oversight, partnership, and innovation model required to meet the design expectations of the Smart Cities Challenge. We have not taken this lightly, as we understand both the challenges ahead for Canada's rural economies, and the huge impact that connectivity, data, and new tools for decision-making can have on its future.

9. Our Promise to Canada - What we will create

AGora is singularly focused on creating a rural innovation incubator that will design and deliver the three key elements to achieve the Vision it set for itself in the original Smart Cities Challenge. It will:

1. Define, establish and operationalize a number of Internet of Things based Farm Area Network pilots to take advantage of the interconnected technologies currently available. *AGora* will establish a Data Trust to collect, store, manage and add value to the data collected through these networks. This will enable farmers, and all rural residents, to improve their operations and to monetize data.
2. Research, define and establish a number of key agricultural-focused Innovation Labs to work with the private sector and academia to deliver new products and services to local farmers, producers and residents through the *AGora* Data Provider Network, the *AGora* Farm Area Network and the Geographic Information Systems (GIS), and other technologies, established within *AGora*.
3. Conduct a number of pilot projects to deliver a fundamentally different means to provide ubiquitous, competitively priced broadband service to rural residents. *AGora* will test a new Data Provider Model, working with other providers already servicing rural clients through electricity and natural gas distribution systems.

Accomplishing these initiatives will fulfill the goals we set for ourselves and support a growing and prosperous rural economy.

A bright future for rural Canada

"Newlyweds Steve and Julie and their growing family just moved back home to take over Julie's family farm. Several of AGora's programs are in place, and the future of farming looks bright. AGora's stable of products are capturing highly relevant data from the family farm, integrating it with specialized applications and are improving decision making. Profitability is up - both from improved farm operations and from the collection and use of the farm's data in ways that benefit the family farm.

Steve and Julie also have been able to relocate and expand the media business they built while living in the city. Agora pilots have proved out, and real time, state-of-the-art connectivity is available throughout the region.

These fundamental changes made farming a more attractive lifestyle choice for Steve and Julie. This vision of the future helped them decide that the time was right to buy out Julie's parents and enjoy living in a connected rural Alberta. "

10. Our Promise to Canada – How Value will Flow

We will create value in four streams of action (Value Streams):

1. We will establish and build *AGora*, as outlined in the "Building *AGora*" Value Stream.
2. The "Farm Focused Technology" Value Stream will deliver on-farm communication capabilities.
3. The "SMART Information Management & Technology" Value Stream identifies cross functional requirements to establish and maintain the systems that will underpin *AGora*, including Data Trust and data oversight, as well as architecture design requirements.
4. The final Value Stream – "Connecting People, Technologies and Farms" lays out specifics on how community engagement and understanding will be achieved.

ENGAGEMENT

Implementing change is difficult, and engaging residents and stakeholders is crucial in obtaining and maintaining their support. This plan describes how *AGora* has engaged communities and businesses to build the proposal and how it will sustain community engagement throughout implementation

1. Community Engagement To-Date

Parkland County held discussions with representatives from the neighboring three counties initially, to inform them of the Smart Cities Challenge, identify requirements, and confirm commitment to create a regional coalition representing nearly 62,000 people.

Farm and business leaders from the four counties were engaged from the start to develop this proposal. These leaders reflected the diverse nature of the region, including farming, ranching, small business, and residential interests. A steering committee was established to oversee the wider community consultation process and provide input to develop our initial application.

Community focus groups provided information on the adequacy key priorities, and next steps. Participants were invited to contribute ideas used to define the challenge. This engagement included agricultural development boards and members of the broader community. In-person interviews were conducted with local officials and other community members.

Common themes emerged that were used to articulate our Challenge and define the key outcomes through which it will be achieved. All four counties formally endorsed the shared vision.

1.1. Preparing This Implementation Plan

Our commitment to community consultation has remained a key focus in this subsequent phase of work. The engagement process was expanded to inform preparation of this detailed implementation plan. The community steering committee provided continuing oversight.

The Design Team

A Design Team of 20 individuals – including steering committee members, other participants from the region, representatives of the provincial and federal government, and sector experts – participated in developing a comprehensive Strategy Roadmap. The Design Team also helped to answer the following fundamental questions:

- Attributes of *AGora* that will incent farmers to participate
- Key features of the innovation incubator that are most important for rural residents
- Pressing connectivity challenges that need be resolved to help maintain rural competitiveness and connection to the on-line economy
- High-level design of the incubator, including structure, staffing, relationship to sponsoring agencies, and the role of the private sector

The resulting Roadmap identifies the strategic goal, the outcomes necessary to achieve it, required actions, and resulting positive impacts and benefits for the region. The completed Roadmap was presented at a regional open house on February 5, 2019, where community members and civic leaders had the opportunity to review and provide feedback on the results.

Community Dialogue

A community engagement process was conducted in parallel with the work of the Design Team. Community members from across the four counties were consulted to obtain input on requirements and delivery priorities, and criteria for a future-focused marketing plan to build community understanding of *AGora* during implementation. This dialogue helped identify early adopter farmers and businesses that are prepared and well-suited to be first-to-market with this approach. This included the following activities:

- Communication through a website, social media, and email lists
- One-on-one meetings, phone calls and written correspondence with community stakeholders including primary producers and food makers
- Workshops using Lego Serious play method to gather community aspirations and concerns
- An online survey for agriculture and community stakeholders

Consultation with the Four Counties

Significant consultation took place with other municipalities that exist within the four counties. This recognized the intrinsic linkages between these communities and their adjacent rural constituents. Many producers and people with rural businesses live in these communities and work on the farm. *AGora* services and technologies will have to link to these communities.

Stony Plain, Spruce Grove, Drayton Valley, Hinton and Edson were briefed on the project and invited to support the initiative. Each has done so. This consultation ensured full commitment of the region to participate in achieving success.

First Nation Discussions

The proponents engaged Enoch Cree First Nation and Paul First Nation as future collaborative partners and have received letters of support from both Nations' Chiefs. *AGora* has several agriculture areas that will support goals of partnering with the Nations in areas such as food security, education, technology and connectivity and job creation.

2. Insights Gained That Have Shaped Our Final Proposal

Community outreach efforts involved focus groups, an online survey, on line postings and one-on-one meetings. Over 800 unique visits were made to our website to become informed on the project. 140 links were provided to the survey to gather input – 77 responses were received. Over two dozen meetings were held with individuals to discuss the final proposal that informed its final design. Outreach has been extensive and significant.

Insights from Community Consultation

An on-line survey was developed to invite participation and input. Respondents described success as (1) ensuring consumers, particularly Albertans, are aware that food produced by Alberta farmers is safe; (2) ensuring financial sustainability of farms; and (3) adopting technology to advance business.

Reasons for Participating

When participants were asked "What would you most like to achieve by participating in the activities of the Agriculture Innovation Living Lab?" the most important reasons for participating were to share input to help develop solutions, gain early access to innovations, and lever these innovations to strengthen their business. The least important reason for participating was to get reduced pricing for being an early adopter.

It appears that contributing and receiving information that will advance their business outweighs the cost associated with accessing that information. This will be important for the sales strategy and marketing material of *AGora* products in the future. The adjoining quotes provide context and are drawn from survey responses.

Connectors and Champions

Participants in the online survey were asked to list where they access expertise to improve their operations. They could choose from people pre-populated by others in the survey or they could list additional people.

Analysis of these relationships identified groups and key stakeholders in the social network. We asked participants to identify who they have collaborated with and who they want to collaborate with, to indicate cohesion; and who they think are experts and where they get innovative ideas from, and to indicate influence.

"Albertans are aware of how safe, responsible, available, and wonderful our home-grown ag products are. Further, Albertans with an interest in agriculture are able to connect directly to our producers, enabling communication, collaboration, and innovation."

"The consuming public accepts that the products we produce are safe and produced sustainably, not only environmental but also economic."

"Have our companies grown from start-up to the next level of their business growth and have the middle ones grown to their next level? Have they introduced new innovations in product development, technology and food safety? Have they gained access to market?"

"Less silos, more working together."

"I track all my expenses, making constant alterations to my plans. I am an entrepreneur I will never truly feel successful and do not want to, because if I did then I would stop driving ideas."

Nine groupings of people were identified who are connected to each other through people they feel are experts. Many of the respondents who answered this question listed one person or a few that they go to for expertise. These individuals in the community are already seen as experts and could be utilized as Community Champions in future work.

There is an opportunity for *AGora* to provide partnership connector services and broker collaborations that may not otherwise happen. A first step for quick wins will be to identify triads in the network map that can be closed. By closing an open triad, a closure with four points of connection is created, fostering network-building and innovation.

3. Community Representation in *AGora*

Community input was fundamental to helping define ongoing community participation.

***AGora* Board of Directors and Committees**

The Board of Directors will be drawn from the Design Team that delivered the strategic plan, municipal representatives and private sector, academic and other levels of government. It will include farm, business and municipal representatives, and others from the region. The role and structure of the Board is described in the GOVERNANCE chapter. Core members have already been recruited.

Partners from the Four Counties

The public engagement process confirmed the roles of existing service providers (agriculture service boards, local non-profits, three levels of government), and academic leaders. Core participants have been recruited. The nucleus for delivery across the four counties is in place. Further work will confirm levels of participation, define clear needs to be met through *AGora* delivery and establish any legal frameworks required to support system deployment.

Early Adopters

Farm and business leaders from the four counties have been engaged from the beginning. Early adopters have been identified from this group to lead implementation. A core group of early adopters will help deliver pilots to improve rural connectivity and be a test-bed for agricultural innovation.

Early adopters will help to identify new ways of connecting rural areas, collecting hyper-local data, and developing tools for on-farm decision making. They will provide access to their farm operations, and support for technology developers using the *AGora* platform. The “Connecting Peoples” Working Group is fully described in the GOVERNANCE chapter of the proposal.

4. Engagement with Community Stakeholders

Ongoing community engagement will enable the proponent to make sound decisions about the future of *AGora*; educate community members about the challenge; inspire confidence in local decision-making; maximize awareness and support for the project once it is launched; and facilitate wise and enlightened project development. One primary on-going activity of *AGora* will be to create opportunities for stakeholders to become better informed.

The “Connecting Peoples” Working Group described in the GOVERNANCE chapter will provide accountability and leadership to *AGora’s* Board on stakeholder engagement, and will identify innovative and evidence-based strategies, techniques, or tools that could be used to sustain stakeholder engagement. The Stakeholder Engagement Plan that will be delivered will ensure two-way communications between *AGora* and stakeholders remains effective, relevant, and efficient.

AGora staff will be responsible for implementing the engagement tactics and activities, and for undertaking regular and on-going monitoring.

Engagement Activities

The implementation phase (Phase 1) will be important and intense, underpinned by significant consultation. We will not only educate community stakeholders about the project, we will develop excitement about the future of *AGora* and its goal of increasing prosperity in rural Canada. We will work directly with the community. Initial engagement will finalize the vision for *AGora*, expressed as a brand and brand promise, confirming the guiding principles for the *AGora* platform, and establishing partnerships to carry the initiative forward. We will involve the public and key stakeholders in:

- Sharing collective aspirations
- Gathering stakeholder input
- Ranking project opportunities
- Ongoing education and information sharing

Engagement will achieve the following outcomes:

- Stakeholders are satisfied with every interaction they have with *AGora*
- The Board of Directors is proactive in seeking information from stakeholders, and is well informed on stakeholder needs and wants
- There is consistency in how stakeholder engagement is conducted and how information is used and reported back
- Stakeholders are recognized for their contributions, and have a real and tangible influence in the direction of *AGora*
- Organizational succession planning is informed and intuitive with a pool of engaged stakeholders

Engagement Tools and Approaches

A variety of engagement tools will be used by *AGora*, including a dedicated website, social media, blogs, electronic newsletters, and traditional media.

The website will be intuitive and responsive, designed and written in plain language so it is easy to understand. It will be accessible in alternative formats and will enable feedback through online questionnaires. The site will link to reports, newsletters, event information, community contributed content, and project communication. An email sign-up function will collect user emails for future engagement and information sharing.

Social media accounts will be created on platforms like Twitter, Facebook and Instagram. These profiles will be regularly maintained, will be engaging, and will have analytics tracking. The goal will be to create an online community of users that can be converted to *AGora* customers using calls to action. Primary producers will be engaged on Twitter using hashtags like #agchat and #cdnpoli.

Use of traditional media will include radio, TV, and newspapers – with columns in newspapers and the *Western Producer*, and spots on the agriculture radio show *Call of the Land*.

AGora will establish extensive connections to people in the region. A community leader database and network mapping tool will help staff planning engagement initiatives to build relationships, invite input from, and engage with people to ensure diverse representation and ongoing inclusion. Team members will engage with stakeholders on an ongoing basis by phone, email, mail and at in-person meetings.

Monitoring and Reporting Results

Stakeholder engagement is only useful when it meets its objectives. Engagement activities, feedback, and the success of engagement efforts will be monitored against the objectives described above. Monitoring will be based on:

- Tracking engagement points, including who attends consultation events, contributes to content creation, identifies an early adopter, participates in prototype projects, visits the website, provides comments, and participates in surveys
- Asking participants to provide feedback on how they feel about being involved in *AGora's* design
- Using in-person and online surveys to determine which engagement activities are useful, fun, informative, and effective for participants
- Internal evaluation of engagement activities by staff and consulting teams, reflecting on the engagement activities at strategic checkpoints in a project: Did we meet our engagement objectives? What did we do well? What could have been better? What will we do differently next time?

Regular reporting of activities, successes, failures, and opportunities will be reported to the community to ensure *AGora* remains relevant and that new stakeholders have ways of knowing and engaging. Once *AGora* is operational, the benefits it enables will be seen by others, attracting wider participation. As other farmers and businesses join, a larger regional test-bed will be created. Deployment to new users will extend regional connectivity and enrich the hyper-local database. Expansion of the infrastructure and information base will be coordinated thorough *AGora*, attracting new private sector participants to its innovation platform.

5. Recruitment and Involvement of *AGora* Partners

A variety of partnerships will be established in *AGora*. The GOVERNANCE chapter describes the roles and contributions of each type. The Communications and Engagement Plan commissioned through this initiative (Kumpula Design, 2019) provides a plan of action for recruiting and training these partners.

Technology partners will be central to *AGora's* success. *AGora* will provide the infrastructure required to develop and deliver products designed to meet specific needs of the farm and business community. Each solution will be created in partnership with one or more private or academic partners. Letters of interest are included in an appendix to the proposal.

We have been successful in obtaining commitments from a large number of municipal, government, academic and technology providers through formal **Letters of Support**.

While relationships have not been concluded, they have all expressed their excitement about this proposal and the chance to work with us to realize its compelling vision.

Summary of Letters of Support and Expressions of Interest Received			
Mayor of Parkland County	Leteta Farms	Town of Edson	Connect Mobility
Service Alberta, Asst Deputy Minister	Brian Olafson	Town of Stony Plain	AB Centre for Sustainable Rural Communities
Minister of AB Agriculture and Forestry	Telus Communications	Village of Wabamun	Parkland Ag Services Board
Minister of AB Economic Development	University of Alberta - Faculty of Science	GROWTH, Regional Economic Dev.	Edmonton Metropolitan Region Board
Chief Morin, Enoch Cree Nation	Yellowhead County	Acheson Business Association	3C Information Systems Inc.
Chief Rain, Paul First Nation	Brazeau County	ATS Traffic	Cybera Inc.
Sightline Innovation Inc.	Lac Ste. Anne County	Stony Plain MLA	EQUS REA Ltd.
John Knapp	Parkland GIS	ISP Computers	ATCO Gas
Alberta Machine Intelligence Institute	West Central Forage Association	Brandon University, Rural Dev Institute	IBM Research & Development Centre
TECTERRA	Parkland Ag Services	Crop Pro Consulting	Ventus Development
ESRI Canada	City of Spruce Grove	FortisAlberta	Dell
Northern Alberta Institute of Technology	Spruce Grove Chamber of Commerce	Comtech Communications	Utility Network & Partners Inc.
Bell Mobility	Town of Hinton	Zayo Canada Inc.	Integral Strategy Network Inc.
ATB Financial	Town of Drayton Valley	Frank Robinson	

Most significantly, *AGora* has secured support from Sightline Innovation Inc., a Canadian IA solution and Data Trust provider. Sightline's support includes participation as a technology provider and manager of the data trust infrastructure. Sightline's suite of technologies and R&D activities will provide state-of-the-art data protection, data management, curation, and machine learning products to inform farm decision making, processing, and market entry. Equally important, its technologies will provide a means by which data collected from farm and business operations would be monetized and deliver value. Refer to the DATA AND PRIVACY and TECHNOLOGY chapters and the CONFIDENTIAL annex for full details.

6. Engagement Within Projects

Community involvement is designed into *AGora's* delivery process. *AGora* will establish and lever participation of local experts, partners and stakeholders. The following structure supports implementation of the four Value Streams, as described in the PROJECT MANAGEMENT chapter.

A core staff of *AGora* employees will provide the foundation for the implementation engine. They will take leadership roles to move *AGora's* Value Streams forward and work directly with community participants through defined Working Groups. These Working Groups will include local stakeholders, partner representatives, subject matter experts, and volunteers, and will help understand, focus, and identify near-term objectives and priority outcomes. See GOVERNANCE chapter for full details.

One responsibility of the Working Groups will be to define work plans that will be reviewed, prioritized, and funded by the *AGora* Board. Once approved, teams will be established to implement the solutions. The Working Groups will oversee the progress of the projects they have submitted.

The intention is to encourage participation on project delivery and wide attendance at community events where *AGora* initiatives are discussed. The Community Engagement Value Stream will ensure people in the community are informed, can propose or champion initiatives, and contribute to any of the Value Streams based on their skills and interests. This will lever the collective intelligence of the community, build internal initiatives through the partner and vendor network, and ensure initiatives are grounded in community needs. External initiatives brought forth by the community, that deliver value and achieve outcomes, will be a testament to a successful change program.

7. First Nations Engagement

In forming this final application, the proponents engaged Enoch Cree First Nation and Paul First Nation as future partners and have received letters of support from both Nations' Chiefs. *AGora* has several agriculture areas that will support goals of partnering with all Nations in the region in areas such as food security, education, technology and connectivity and job creation.

AGora will be committed to meaningful indigenous engagement. It will seek to establish a strong relationship and build trust between the project and indigenous stakeholders, based on:

- Developing a wholistic understanding of the communities, by conducting or compiling research including the history of the community, environmental concerns, fishing, hunting, and gathering activities, spiritual practices, governance, tribal council affiliations, decision making structure, role of leaders and elders, identification of elders, community priorities, socio-economic situation, relationship with counties, and relationship with any previous project proponents.
- Respecting the ongoing impacts of colonialism, the history the community has with the land around them, and cultural differences.

Upon award of the Smart Cities Challenge prize, we will extend our engagement to all Indigenous communities in our region and the urban Indigenous community in neighbouring towns and cities.

8. Diversity, Equity and Inclusion

Significant effort has been made be inclusive and consider the diversity of residents, including identifying how specific groups can be involved in delivery. Ensuring equity requires understanding who is currently being engaged and developing strategies to engage other populations. Review and analysis of participation in engagement activities is critical. Historically, affluent white males tend to be the main participants in traditional engagement activities. Being aware of this and employing strategies such as those listed herein will ensure equity in stakeholder participation.

AGora will use human-centred design concepts such as place-based engagement, where the engagement team goes to stakeholders rather than expecting stakeholders to come to them. It is known that this type of engagement increases diversity and allows for engagement of different population groups that wouldn't traditionally participate in community engagement activities. Another

example is the use of prototypes and community design review workshops where stakeholders are asked to provide feedback. This will engage a broader population.

AGora will conduct community based participatory research on its own or in partnership with post-secondary institutions. This will engage with those most affected by a challenge or issue to support research and analysis and identify strategies to address the challenge.

Engaging Youth

Engaging youth in municipal activities is typically challenging and has seen limited success. Youth engagement initiatives proposed for *AGora* include:

- Working with 4H groups, local secondary and post-secondary schools and using existing makerspaces and hackathons to engage with students to create and collaborate on projects.
- Pairing students with partner companies in technology, media, or agri-food, as mentors, or sponsors of internships or work placements.
- Involving youth in video production to be used in *AGora* or for future consultation events.

Community Outreach Activities

To obtain community input from people who don't typically get involved in these types of consultations, we also will pursue other outreach activities:

- Engaging in conversations where project team members visit coffee shops where farmers and community members gather, randomly buying people coffee and sitting down to engage in a brief 5- to 10-minute conversation about *AGora*. This technique will be used at strategically selected times through implementation.
- Using network mapping to identify people in the community who have strengths and expertise to share, and others who are looking to improve their capacity in a particular area. By identifying and engaging these groups, *AGora* will help to establish peer networks that bring new ideas and engagement from people and organizations that may not typically engage with each other. This also will assist in obtaining input from the 'silent majority.'

In summary, it is critical to understand problems and opportunities by working directly with the affected population or stakeholder groups to develop options rather than working on solutions for them in isolation. Otherwise, it is difficult to fully understand the challenges these groups face and define the opportunities to overcome them. *AGora* will evaluate options based on the feedback received from diverse populations and will ensure consideration is given to how the plan will benefit other population groups, particularly the most vulnerable.

Workforce Training

Through the *"Connecting Peoples"* Working Group *AGora* will develop a training plan for users, operational staff, partners, and customers. This training will use the most appropriate and advanced technology for delivery. There are some excellent training firms in the region.

9. Risks and Mitigations

AGora's proposed corporate structure inherently manages risk – duties, structure, planning processes, policies, regulations and overall accountability processes both assign responsibility and contain risk. The GOVERNANCE chapter fully articulates roles relative to how public engagement will be managed, deployed and delivered.

Managing Community Expectations

Risk - Unrealistic expectations of residents that all ideas and suggestions will be implemented.

Mitigations - Communicate levels of ambition when planning and initiating stakeholder engagement. Ensure the process is fully explained and that stakeholders are clear about the decisions and approaches being taken. Inform and involve key community members in implementation.

Lack of Follow Through

Risk - The community does not see follow through related to outcomes of the engagement process and lose faith in the process or the project.

Mitigations - Ensure actions, even if small, are implemented in a timely manner after engagement with stakeholders. Before engaging, ensure that appropriate resources are allocated and that implementation plans are achievable. Communicate with stakeholders when decisions are made on what will be implemented.

Lack of Representation and Inclusiveness

Risk - Some people or groups may lack the time, confidence, mobility, language skills, or ability to contribute equitably. Vocal and organized groups may be more active, which leads to unrepresentative participation.

Mitigations - Determine the level of representation and input that is practical and achievable given the resources and timeframe. Use existing networks, and community champions to encourage participation. Use appropriate engagement methods at the right time and in the right place. Ensure engagement events are accessible and that they are culturally appropriate for a range of participants. Tailor engagement activities for different stakeholder groups.

Over-Engagement

Risk – Over-engagement is non-productive. This may lead to consultation fatigue and cause community members to become antagonistic or cynical.

Mitigations – Where relevant, use the results of previous engagement processes that have worked. Ensure engagement activities are meaningful and create clear outcomes. Focus engagement activities on stakeholder groups whose ideas, needs, and concerns are less understood than those whose perspective is already well known.

Negative Input

Risk - Community members may be overly negative toward the project due to other frustrations with the municipality, based on previous or current engagements.

Mitigations - Focus on future-forward conversations. Listen to stakeholders and acknowledge past experiences. Use engagement methods that are appropriate for the desired outcome. For example, avoid an open house when there is already known anger or extreme controversy.

Lack of Interest in Participating

Risk - Many municipalities have challenges getting participation and have become reluctant to spend resources on engagement processes.

Mitigations - Spend adequate time identifying stakeholders and ways of involving them that is appropriate for the desired outcome. Ask stakeholders how they would like to be engaged. Ensure activities are fun, social, and held at a time of day and location that is convenient. Identify Hubs in the community where people naturally gather and engage with them there. Be clear about the levels of ambition, ensure stakeholders know the influence they can have. Ensure feedback is provided to people about how their input is reflected in a project.

Managing Unintended Impacts

Risk – A project has unforeseen adverse consequences.

Mitigations - Clarify the challenge to ensure engagement efforts result in more sustainable solutions and avoid adding to the problem. Involve various population groups prior to developing solutions to understand the impact on each population group and identify the solution with the least negative impacts on stakeholders. Ensure transparency of communications so, when unintended impacts occur, stakeholders are informed and can participate in managing the outcome. Build and promote relationships with stakeholders to establish trust and reduce uncertainty among population groups. Ensure stakeholders including staff have access to resources and knowledge for project management and stakeholder relationship management.

Dealing with Unanticipated and Emergent Issues

Risk – Stakeholders react negatively to unanticipated and emergent issues.

Mitigations - Manage stakeholder expectations to assist in dealing with and overcoming issues. Build meaningful dialogue with stakeholders about the issues of interest in the project. Communicate with stakeholders early and often and create the opportunity for stakeholder engagement when issues arise to ensure community participation in solutions. Regularly monitor the stakeholder group against the project maturity, realizing that the group may change depending on project activities.

TECHNOLOGY

Connected technologies and data sovereignty are the core of this Smart Cities proposal. The following sections outline key technologies that will be put in place to deliver hyper-local data collection needed to derive value from connected technologies, deliver the enabling pilots necessary to better link farms to the world, and enable software to be created to support focused decision making. Creation of the necessary technologies to collect, manage and monetize farm data – a new crop – delivers new revenues in support of increased rural prosperity. Deployment of rural-focused software 'labs' supports rural innovation and delivers superior decision-making tools to all.

1. A Catalyst for Innovation

The diagram on the following page broadly describes how access to hyper-local data will be enabled across the four-counties; how it will be managed, curated and monetized; and how the various elements will be delivered.

AGora will provide value to data providers, AGora itself, academia, and the private sector through a series of Innovation Labs dedicated to data analytics, software design and infrastructure development.

The Labs will pilot new communications technologies and will incent participation by partners to create new products and services and conduct focused research that supports rural and agricultural development.

2. The Technology Environment

To enable digital innovation, *AGora* will design and deploy technology that includes internet connectivity and farm area networks, underpinned by *AGora* technology and Data Trust platforms.

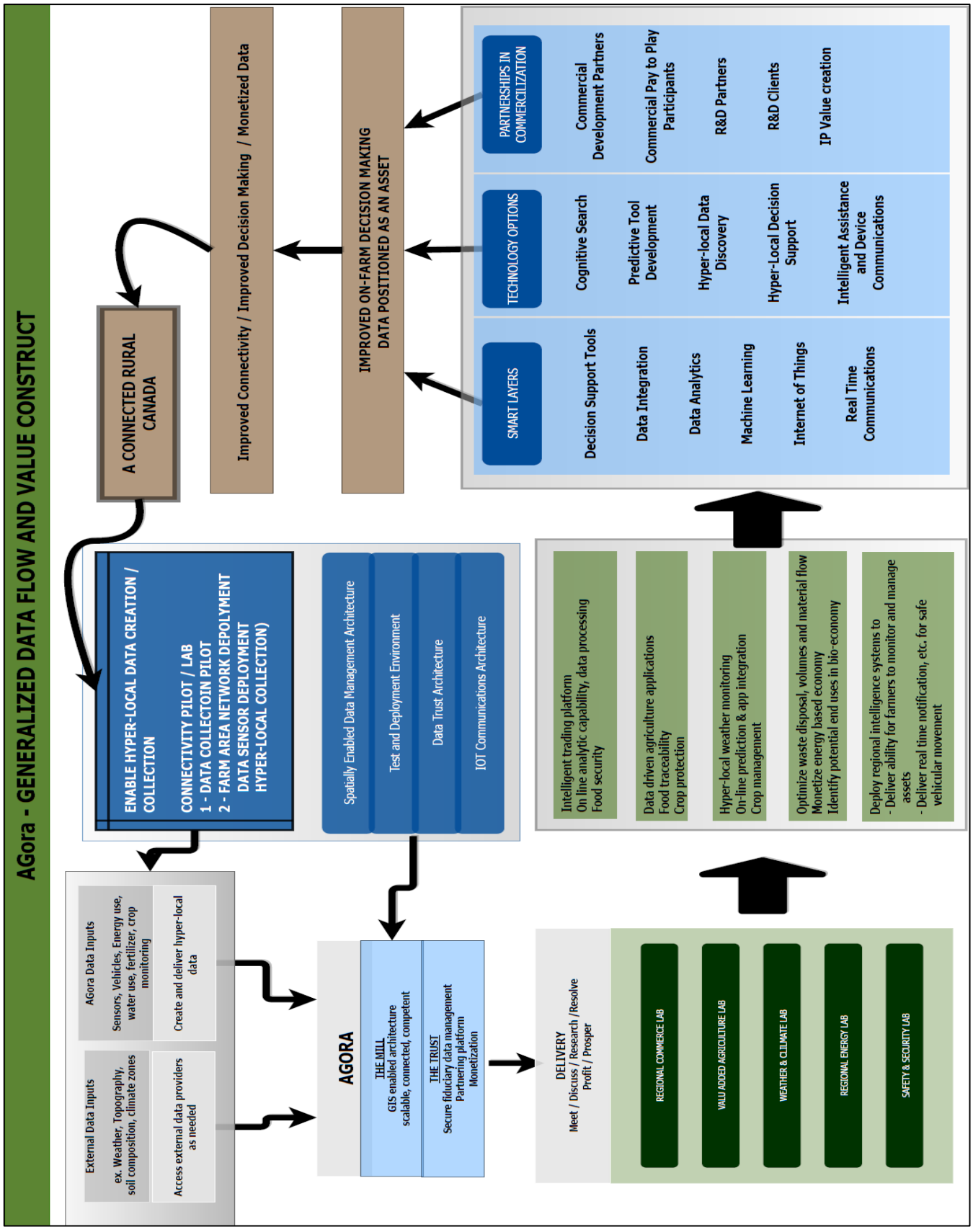
Internet Connectivity

Connectivity and capacity are significant communication barriers in the region due to the large geography and relatively small size of the rural market. This is a fundamental challenge that has predicated most of the activity in the four counties and much of this proposal. Traditional service providers have been reluctant to invest. *AGora* will undertake competitive pilots with non-traditional service providers to test and evaluate new connectivity solutions.

Farm Area Networks (FANs)

AGora will test the ability to collect hyper-local data at the farm level. Farm Area Networks will disperse connectivity over 10- to 20-acre plots, configured based on each farm's layout, orientation and structure. *AGora* will deliver pilots to define acceptable technical performance criteria for Internet of Things deployment.

Farm Area Networks will support agricultural sensors deployed to monitor farm operations and develop solutions to increase farm productivity and profitability. *AGora* will establish a foundational Internet of Things infrastructure for baseline data collection; this will be expanded with additional sensors, as new applications are tested and deployed.


AGora - GENERALIZED DATA FLOW AND VALUE CONSTRUCT
A CONNECTED RURAL CANADA
Improved Connectivity / Improved Decision Making / Monetized Data
IMPROVED ON-FARM DECISION MAKING DATA POSITIONED AS AN ASSET
ENABLE HYPER-LOCAL DATA CREATION / COLLECTION
CONNECTIVITY PILOT / LAB
1 - DATA COLLECTOIN PILOT
2 - FARM AREA NETWORK DEPOLYMENT
DATA SENSOR DEPLOYMENT
HYPER-LOCAL COLLECTION)
Spatially Enabled Data Management Architecture
Test and Deployment Environment
Data Trust Architecture
IOT Communications Architecture
SMART LAYERS
Decision Support Tools
Data Integration
Data Analytics
Machine Learning
Internet of Things
Real Time Communications
TECHNOLOGY OPTIONS
Cognitive Search
Predictive Tool Development
Hyper-local Data Discovery
Hyper-Local Decision Support
Intelligent Assistance and Device Communications
PARTNERSHIPS IN COMMERCILIZATION
Commercial Development Partners
Commercial Pay to Play Participants
R&D Partners
R&D Clients
IP Value creation
Intelligent trading platform
On line analytic capability, data processing
Food security
Data driven agriculture applications
Food traceability
Crop protection
Hyper-local weather monitoring
On-line prediction & app integration
Crop management
Optimize waste disposal, volumes and material flow
Monetize energy based economy
Identify potential end uses in bio-economy
Deploy regional intelligence systems to
- Deliver ability for farmers to monitor and manage assets
- Deliver real time notification, etc. for safe vehicular movement
External Data Inputs
ex. Weather, Topography, soil composition, climate zones
Access external data providers as needed
AGora Data Inputs
Sensors, Vehicles, Energy use, water use, fertilizer, crop monitoring
Create and deliver hyper-local data
AGORA
THE MILL
GIS enabled architecture
scalable, connected, competent
THE TRUST
Secure fiduciary data management
Partnering platform
Monetization
DELIVERY
Meet / Discuss / Research /Resolve
Profit / Prosper
REGIONAL COMMERCE LAB
VALU ADDED AGRICULTURE LAB
WEATHER & CLIMATE LAB
REGIONAL ENERGY LAB
SAFETY & SECURITY LAB

AGora Technology Platform

The *AGora* technology platform can be thought of as web-based services focused on data management – GIS enabled and connected to a suite of data analytics – that can be extended to host an application portfolio. The intention is that the model be completely cloud-based. It will be designed using a "software as a service" model to ensure scalability and transferability.

AGora will provide a minimum latency testing and development environment for partners and vendors to use for prototyping and development, generating an *AGora* revenue stream.

The farmer and vendor portals will be integrated with the data view and application portfolio. *AGora* will prove, develop and support this capability. Internet of Things deployment will deliver rivers of data for each farm, providing additional value to *AGora* partners, supported by appropriate technologies.

Data Trust Platform

AGora will work with partners who use data to create value. To ensure that the rights and privacy of data providers are protected, and those providers benefit from the use of their data, *AGora* will implement a Data Trust. Trust in the traditional sense of the word is a three-party relationship where an asset/value is transferred from a Grantor to a Beneficiary through a Trustee. A Data Trust takes this concept further and establishes a technology framework that enables control and sovereignty of data assets between data partners.

"Phil has completed another harvest, and now its time to plan for next year. All of the data collected from his farm for the past year (and before) have been collected into AGora, incorporated into its GIS and the Data Trust, and analyzed. He has at his fingertips information that links national and international corporate decision tools with his own. This software now is intelligent enough to tell him site specific information that he will use to make decisions about next year's crops.

Thanks to AGora's information services, he has access to the best available forecasting tools regarding future's prices and anticipated yields of the various crops that fit his site-specific characteristics best. He's looking forward to another profitable season."

3. The Technology Working Group

Further work will be required to assess and confirm the products, services, and pilot projects required to bring life to *AGora*. A select number will be necessary to establish operations, connectivity, and initial client value. They are defined in this proposal, along with the associated costs. As described in the GOVERNANCE chapter, one role of the Technology Working Group will be to conduct this assessment and confirm a delivery plan. Led by the Chief Technology Officer, teams will implement the framework, below, and champion the principles through the life cycle of the work ahead.

4. Core Technology Architecture

The overall design will apply open technologies, standards, and policy based on an agnostic architecture. It will allow freedom for innovation and maximization of value. This architecture will rely on a framework that emphasizes:

- Understanding of and alignment with a Business Vision across the various services to be provided.
- Logical modelling, that pays attention to well-bound component models, and open, standardized component interoperability. This will address fundamental requirements and concerns like information and device security; and messaging, protocol, pattern, and content standards.
- Devotion to scalability, extensibility, interoperability, replicability, portability, and reusability. Strongly influenced by concerns for accessibility.
- Anytime, anywhere, any-device access.
- Application of established Best Practices, and definition of new Best Practices for use by other communities in their Smart City initiatives.
- Use of generalized models and standards related to the Internet of Things, assimilating and applying new ideas and standards as technology is developed.
- Continual monitoring of technology trends and vendor capabilities. The market for Smart City transformations will be large, leading to prosperity for both adopters and providers. Marketplace competition will drive increased value.
- Use of pilot projects to mitigate risk, maximize value, and establish Building Blocks, with an emphasis on re-use. The more re-use, the less that needs to be done, maintained, and operated (a smaller footprint).
- Use of cloud services as 'quick-to-market' platforms for delivering early value.
- Attention always to the cost of ownership, avoiding vendor monopolies.
- An evolutionary approach that avoids the big bang and provides benefits early and often.

5. Open Technologies

AGora will have a strong preference for open and open-source technologies. There are two general classes of services: (1) more traditional services like back-end analytics, collaboration, and resource pooling; and (2) innovative applications and data sharing. In the first case, technology is more mature and there is greater freedom of choice for standardizaton. In the second, there are fewer options; we don't want to limit innovators, but will require compliance with important things like the security framework, messaging standards, etc.

These demands drive creation of core partnerships with companies where security, standards and data integritywill be maintained and balanced with demands for cohesion across business, application, information, and technology domains. As described in this chapter, Sightline Innovation Inc delivers the only built-in Canada solution that enables data sovereignty without eroding control resulting from data owners being forced to move to a cloud provider or being subjected to vendor lock-in tactics.

Non-Proprietary

Services will be provided in a way that is open and non-proprietary. Logical boundaries will be established which facilitate the participation of partners with proprietary technologies. For example, Data Providers will be able to gather data in the manner they like, but security, transport, message construct, and delivery to Data Consumers will be standardized and based on Open concepts.

Multi-Vendor

A logical component model will drive provisioning of technologies through granular, well-defined requirements. The overall technology architecture will allow for multiple vendors to participate while *AGora* supports integrated and interoperable solutions. Vendors will seek to promote their own end-to-end offerings. These offerings will be evaluated in light of their implications for vendor lock, cost of ownership, and constraints on agility and extensibility.

6. Technology Standards and Policy

AGora's technology architecture will ensure business alignment. A Technology Standards and Policy Framework will be put in place that maps business services to application components, that are in turn mapped to technology platforms, standardized or optional technology, and policy. *AGora's* intent is to produce portable, replicable solutions that significantly reduce deployment cost to other locations.

International Standards Organization (ISO) and other certifications will be sought, as required, as confirmation of diligent engineering, and to enhance attractiveness to other communities.

Interoperability & Open Standards

Interoperability will be architected based on open standards defined through best practices. The industry has come a long way in the last 20 years. Patterns of interoperability will be selected that support other core objectives such as scalability and availability. Today, the preference is for asynchronous messaging that can behave like synchronous messaging, and is expected to mitigate a variety of issues related to unexpected downtime by participating systems. It also allows for incremental 'forwarding or streaming' of data from source to analytical stores, rather than dependence on potentially long batch cycles.

Replicability

Replicability will not be limited to reusable, portable solutions, but will include business processes and governance frameworks. *AGora* will architect so third-party innovation and intellectual property are uncoupled. This will allow for 'plug and play' of alternative solutions. We will protect third party Intellectual Property, and will endeavor to arrange for re-use by other consumers at reduced cost.

Our proposed open, standardized technology will be designed with scalability, replicability, and extensibility in mind. Open and standardized technologies, by themselves will ease the challenges of portability. Portability will be further enhanced through well-bound, uncoupled, cohesive solutions, so discrete 'portions' of the solution can be packaged and ported as sub-system modules or, at a minimum, re-usable frameworks. This also allows *AGora* to port easily to other hosting partners should we be dissatisfied with the service.

Scalability

Scalability will be tested in pilot projects or proven through prior application. Almost all scalability issues can be addressed by adopting patterns that have been proven to be scalable. If there are issues, they will be identified early, and appropriate expertise can be brought to bear. Scalability issues are typically a function of flawed architecture/design in a technology, information or application domain. Resources are readily available in the marketplace to deal with these issues.

7. Accessibility and Usability

Accessibility and usability of technologies and applications are planned to go beyond 'anytime, anywhere, any device' access. To the greatest extent possible *AGora* will design and implement tools and systems that are usable by all people. This will be enabled through negotiation of development agreements with private sector firms to ensure overall usability. This will expand the population of contributing participants and increase the value they receive. This includes designing for visual (blindness, color blindness), physical, and capability (oral, language) considerations. These requirements will be elaborated and ranked early, and throughout the initiatives so they can be addressed through the requirements, design, develop, and test iterations.

8. Future-Proofing

IT Architects have learned hard lessons from years of being trapped into forced, costly upgrades of proprietary technology. *AGora* will take all due care and diligence in making technology choices, and contracts with technology partners will be designed to provide appropriate protections.

Architects will research current and future trends. The growing Smart Cities community will increase the availability of resources. Initiatives by *AGora* itself should influence the local market. Partnerships with educational institutions, and employment of young graduates is one way to effectively future-proof the solutions. By embracing simplicity, isolating complexity, and committing to well-bound logical modelling, an adaptable and continually evolving solution can be implemented.

The Data Trust is designed to grow and accommodate the impending wave of massive Internet of Things (IoT) technologies and new data sources. It also is designed to meet the needs of future regulations around the governance of data. As data production becomes more ubiquitous, we anticipant governments in the coming years to update existing laws or enact new legislation around the use, governance, and sovereignty of data.

9. Compliance with Legislative and Regulatory Requirements

Compliance with Legislative and Regulatory Requirements will be articulated and designed into every part of the solution-building framework.

10. Platform Technologies & Collaborators

Core capabilities within *AGora* will be supported by two underlying technologies. First is a fully secured data management solution – the *AGora* Data Trust. Second is a fully integrated Geographic Information System (GIS). *AGora* will deliver secure data management of IoT initiatives through its platform. Discussion is provided, below, with further details on how proposed technologies will protect and secure data in the DATA and PRIVACY chapter.

Through the development of this proposal significant effort has been invested in building corporate and academic interest in the work ahead. The following section outlines the enabling technologies that *AGora* will develop over its initial five years of operation. Those with appropriate technologies or having expressed interest in the technology opportunity are linked and identified, below.

10.1 The *AGora* Data Trust

The *AGora* Data Trust will collect, move, share and profit from the data that is provided to it. AGora's Data Trustee role will be legally defined and will clearly state the fiduciary responsibilities held by AGora and the respective parties. The Data Trust will be delivered through proprietary technology that is tested and deployed to protect, curate and monetize data on behalf of data providers. The structure for *AGora's* operations relative to equity, safety and security of operation will be established through the incorporation process. *AGora* also will confirm its fiduciary responsibilities:

- Accepting its responsibility to manage and provide honest-broker secure access to data on behalf of the farmers, businesses and others that maintain and provide data to it.
- Obliging its operations to provide long-term benefits to providers of the data.
- Confirming the technology framework to grant sovereignty over the data provided, grant control over the assets held in trust and establish pre-conditions for participation – a contract with each data provider and data user.

AGora assets will include data, curated datasets, analytic models, intellectual property, and machine learning technologies developed onsite. A Data Use Policy Framework will be developed to guide data use. *AGora* will work with data and technology providers to establish policies for this purpose.

The proponents have held significant discussions with technology solution providers to find potential partners with the same view of data, data ownership and monetization, in advance of committing to a specific vendor. Given that *AGora* is not yet a legal entity, no specific agreement has been established to provide the required architecture and

> *"Phil and Arne just left the last meeting of AGora's Technology Working Group. To say they were pleased is an understatement – they were ecstatic! While there, AGora transferred into their bank accounts the first payment from the Data Trust. As early adopters, they helped AGora set up the Trust, describe what data is most valuable to them, and what needs to be done to collect it and then use it to add value to their farm operations. They then helped design the system to collect all the hyper-local data going into the Trust.*
>
> *It was a long process, but now it is paying off handsomely. Companies are paying to access the data. And, as importantly, AGora is delivering to Phil and Arne huge amounts of information to help with on farm decisions. Decisions are becoming easier, and the time saved is being channelled into family, community and other farm activities."*

technology solution. However, Sightline Innovation Inc., a leading Canadian technology provider, has provided a technology framework in anticipation of working with us to define their future participation in full deployment. Core elements of the solution are:

- Sightline's technology enables people, organizations, companies, and governments to control their data, derive value from data, and gain better insight from existing data sources in real-time across multiple business units and organizations. Its comprehensive Data Trust Platform is the only built-in Canada solution that enables data sovereignty without the erosion of control resulting from data owners being forced to move to a cloud provider or being subjected to vendor lock-in tactics.
- The company provides its services through two proprietary and patented Software as a Service (SaaS) based platforms: Sightline Innovation Data Trust ("SID") and Sightline Innovation Machine Learning for Optimal Networks ("SIMON").
    - SID is as a trusted alternative to centralized data lakes for Trust members to share data and perform advanced analytics at scale. The platform provides the ability to keep data in place, share data securely in a virtual data-exchange facility, and uses AI and distributed ledger technologies for network governance, membership onboarding, project evaluation and performance monitoring.
    - SIMON is Sightline's AI and machine learning platform. It provides AI capabilities through the integration of three distinct components: AI Domain, AI App, and AI Edge. SID and SIMON are currently delivering computational value in the Canadian agriculture, health, defense/biosecurity, and manufacturing sectors.

Refer to this proposal's CONFIDENTIAL Appendix for details on the Sightline family of technologies

10.2 Geographic Information Management

Data will be the critical focus and content of every product and service supported by *AGora*, which will be underpinned by a geographically-enabled data platform. A cloud-based scalable Geographic Information System will manage and access the growing array of geographically-referenced data. It will house diverse data related to the Region. Through this platform *AGora* will collect, curate and distribute data on behalf of participants and organizations looking to develop and commercialize new agricultural applications. ESRI Canada has offered their family of GIS technologies. Future discussion will fully define their roles.

11. Communications Technologies

The Regional Connectivity Lab will pilot and deliver the infrastructure required to collect hyper-local data and connectivity across the region on par with today's urban experience. This connectivity will be instrumental to enrich *AGora's* data assets and operationalize the innovations that *AGora* will develop with private sector partners. The Lab will be deployed as part of the early formation of *AGora*.

The Lab will accelerate expansion, improvement and utilization of wired and wireless connectivity throughout the region. Work will be based on a comprehensive geospatial map of all tele-communication infrastructure in the Region, including optical fibre, copper wireline networks, and terrestrial and satellite wireless networks. Maps will use data acquired from local governments, senior

governments, network operators and other external sources, and from field mapping projects to fill gaps in coverage. Geospatial co-ordinates are an essential dimension to all fact-based analytics.

The regional telecom infrastructure map will be used to devise strategies, solutions and plans for expanding and improving digital connectivity throughout the region. This will require cooperation between property owners, local governments, senior governments, telecom network operators and other partners including energy providers and Internet service providers. *AGora* will undertake and support development projects to expand and improve digital connectivity in the Region, starting with two pilot projects.

11.1 Pilot 1: Internet Connectivity via an Energy or Gas Provider

Most farms and residences in rural Alberta are connected to an electric network and a gas network. Most of this rural infrastructure was developed through collaboration with property owners, governments and the service provider.

This pilot will test the viability of using these providers to deliver rural fibre connectivity comparable to urban Canada – across this rural landscape.

AGora will undertake a Data Provider Network (DPN) Pilot Project that supports the Farm Area Networks (FANs - detail following) with optical fibre connections managed as an open service. As with established rural energy networks, building rural data functionality will require collaboration between property owners, governments and operators. Electric utilities that incorporate data provision into their infrastructure can use it to mitigate growing risks posed by accelerating adoption of distributed power generation and storage systems by customers.

This pilot will include the following:

- Partnering with one or more electric and/or gas providers interested in incorporating optical fibre data provision into their existing infrastructure and operations**: four have expressed written interest**
- Collaborating with providers, governments and engineering and regulatory consultants to identify and eliminate technical and regulatory obstacles
- Collaborating with providers to choose footprints for one or more pilots
- Engaging, educating and organizing rural property owners within pilot footprints, and guiding them in developing connectivity co-ops to accelerate utilization and drive return on investment
- Collaborating with connectivity co-ops, service providers, providers and governments to develop sustainable and scalable models for financing, operating and using data infrastructure
- Managing the pilot for a period of 3-4 years, and developing a succession plan if needed
- Attracting multiple service providers interested in leasing capacity on the infrastructure developed to deliver digital services to rural communities, including competing service providers
- Defining, measuring and reporting on meaningful performance metrics

Expertise developed during deployment will be captured in a series of Best Practice Case Studies for future development by both *AGora* and others as Canada-wide scale-up takes place.

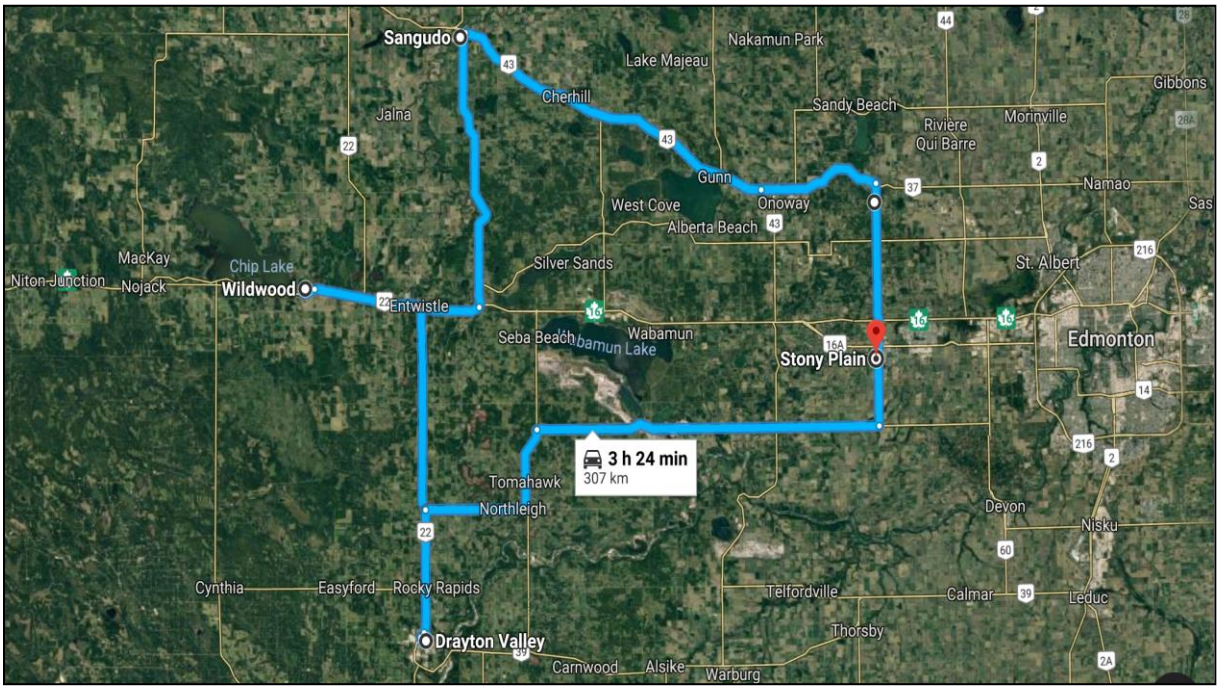
Technology providers have indicated interest and confirmed support. Most significant, four energy utilities will provide time and effort in support of proofs-of-concept through the Regional Connectivity Lab pilot projects. FortisAberta, EQUS REA Ltd., ATCO Gas and Zayo Group have all confirmed their interest in participating in pilot initiatives to assess how their existing infrastructure can be used to

support broad deployment of rural communications technologies. **This is considered a fundamental achievement**. The ability to collect and move information cost-effectively in a rural region is essential. *AGora* will determine how this will be achieved through the participation of these companies.

11.2 Pilot 2: Establishing Farm Area Networks (FANs)

AGora will undertake a Farm Area Network (FAN) Pilot Project to demonstrate the value of cheap, ubiquitous and unlimited on-farm connectivity for agricultural operators. The FAN Pilot will connect a diverse array of remote digital sensors and other devices to on-farm wireline and wireless networks, enabling remote monitoring of the environment and operating conditions, and remote operation and management of fixed and mobile equipment.

For efficiency of fibre optic access, the FAN Pilots will deploy close to County offices. *AGora* will use the FANs to collect data and deliver experiential understanding of digital on-farm innovation and hyper-local data collection



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Each FAN will enable wireline connectivity within a farmstead, as well as wireless connectivity by way of a mesh network that serves a footprint at least one kilometre in diameter. Existing poles and buildings will be used where suitable to mount access points for the wireless mesh networks, but additional poles or towers may be required to provide connectivity into fields. The pilot will include:

- Building partnerships with technology and service vendors interested in leveraging the FAN
- Piloting to showcase their solutions, including network solution providers
- Selecting suitable early adopter farm operators to serve as venues for the pilot
- Designing the financing, technical, operating and business models for the pilot
- Coordinating and managing development of the FAN networks
- Procuring, installing, monitoring and maintaining the initial constellations of devices connected to each FAN, and adding to these constellations as needs and resources allow

- Managing the pilot for a period of 3-4 years and developing a succession plan
- Engaging communities and local innovation leaders in experiential 'show me' learning relating digital innovation in agriculture and rural life
- Defining, measuring and reporting on meaningful performance metrics for the pilot, including impacts on rural innovation activity and leadership.

Optical fibre connectivity for all FANs will be essential to the effectiveness of the pilot. The proponents believe the performance of optical fibre connections can be vastly improved at marginal incremental cost, enabling the FANs to support the broadest range of digital innovations far into the future.

Today, fibre-connected homes and businesses in Olds, Alberta can buy Gigabit-per-second (Gbps) Internet service for $125 CAD/month. Fibre-connected homes and businesses in some U.S. markets can get 10 Gbps service for only $200 to $300 USD/month.

Bringing the same performance and pricing to homes and businesses throughout rural Alberta requires a fundamentally different paradigm for rural connectivity. The current paradigm forces service providers to build their own physical networks to deliver their services, but related costs are an insurmountable barrier to market entry for most would-be competitors. This is especially debilitating in low-density rural areas where competitive connectivity is needed most, but markets are too weak to support effective competition.

"Joseph's Farm Area Network is being expanded. Initially, a collection network was built to gather hyper-local data on farm operations at his immediate farm site. All machines, fixed assets, inventories and 'precision-farming' equipment were connected. Sensors were deployed to collect vehicular movement, moisture condition, and planting (variety, nutrient, chemical) and practices, etc.

Now, he is expanding the system to collect data from two new sources – full lifecycle tracking of his cattle herd, and to a newly purchased section of cropland 20 miles west. His current FAN has paid for itself, and has cost justified expansion to other parts of the business. An additional benefit he enjoys, thanks to AGora's Regional Security System is the comfort, and reduced insurance premiums, of knowing his valuable equipment is protected while he and his family sleep and even go on vacation."

Collaborators, Expressions of Interest and Technology Alignment

Bell Mobility	Telus Communications	Cybera Inc.
FortisAlberta	ATCO Gas	EQUS REA
Zayo Canada	3C Information Solutions	Utility Net
O-Net	Connect Mobility	Comtech Communications
First Nations Technical Services Advisory Group	IBM Research & Development	ISP Computers

12. Application Labs

AGora will establish a secure testing and development platform that provides internet enabled tools to enable residents to meet, discuss, research, resolve and ultimately prosper from the data access provided by the interactions generated and the data that will underpin *AGora*. This is where private sector partners, and perhaps even competitors, can work together to co-develop new innovations to benefit the farmer and other rural residents. These 'Labs' will be enabled in several ways. First is active definition of requirements with a specific vendor, in partnership, that delivers the requisite capabilities. Second is by making available the data housed at *AGora* to interested parties that, in turn, develop specific applications. Content, challenge and opportunity definition will confirm which approach is most viable given the 'Lab' in question.

12.1 Regional Commerce Lab

With a website in place, one of the first capabilities that will be established is an on-line tool for commerce. Developed and managed in partnership with a commercial vendor, the Regional Commerce Lab will deliver a marketplace/trading system that allows farmers to advertise their products and services within the region and beyond. Initial plans include land for rent or sale, new and used products for sale, and specialty items. This system also could be a vehicle for community associations, clubs, blogs, Do-It-Yourself groups, and a video library. This will enable many other community cross-connections.

"Jane poured herself a coffee and sat down to log into AGora to check if any of the chickens she had posted yesterday had sold. So far 6! She transfers her funds into her account and messages to make delivery arrangements. Not a bad start to a Saturday. She noticed she had a message on one of the message boards. It was a recent graduate for Olds College wondering if she still had the summer job available that she had posted a week ago? Maybe one more cup of coffee and watch a quick video – the one the research teams had sent her about new feed for her poultry."

The Regional Commerce Lab will be a vehicle to support 'buy local' initiatives. This will allow people in urban areas to source and purchase locally grown and made products and communicate directly with the producer. Using data provided by both buyers and sellers, it will enable research and analysis of regional markets and identify future growth opportunities.

Several products will support regional food security initiatives. The World Food Summit of 1996 defined food security as existing "when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life." *AGora* will provide the ability to encourage and facilitate food security for rural, urban and indigenous communities. The issue of food security will be addressed, and solutions discovered, through the partnership between community and technology.

This is a priority deliverable given the maturity of on-line market solutions, and the many partners that exist in the marketplace. Several have indicated a willingness to work with *AGora* to move forward.

Collaborators, Expressions of Interest and Technology Alignment

Expression of Interest / Technology Alignment	
Sightline Innovations	NAIT Industry Solutions
CropPro Consulting	Alberta Machine Intelligence Institute
University of Alberta	ATB Financial

12.2 Regional Value-Added Agriculture Lab

The Regional Ag and Food Lab will map, monitor and analyze agricultural production in the region. It will improve understanding of food production and food safety by rural and urban residents alike through delivery of data-driven agriculture that uses hyper-local data. Blockchain technology will secure and enable data collection and the analytics required to support ever-increasing demands for food traceability, much like how *Gem* is working in the USA with the Centre for Disease Control to put epidemics on blockchain to increase effectiveness of source identification and disaster response. Applications will prove provenance, inform production decisions and identify gaps in the supply and security chain of farm products as they move to market.

> *"The video Jane is watching is about the new process that will track her poultry from hatching to freezer using the new block chain technology. It will help take away consumer questions when she can track all that went into the birds and download it onto an FAQ sheet to go with delivery. When the video is over, she logs into the member area and sees how the other participants in the poultry study are doing. She makes a note that one other participant's birds are maturing much quicker than hers and enters her own weekly data."*

Key enabling features that have been identified by farmer participants process include mapping and monitoring agriculture and food operations and markets throughout the region, having the ability to conduct research, and analyze regional potential for agriculture and food production (gap and opportunity analysis). *AGora* will build regional capacity for data-driven agriculture and help deliver traceability of primary and value-added products, improving food safety overall.

Significant future partners have indicated a willingness to work with *AGora* in co-development. Farmers themselves are being required to provide ever more detailed information on point-of-origin food provenance and contact traceability as animals move through the feedlot system (point of contact detailing for disease tracking etc.). Canada is expecting and demanding greater proof of food safety to support expanded domestic and export markets.

Collaborators, Expressions of Interest and Technology Alignment

Expression of Interest / Technology Alignment		
Sightline Innovations	ATB Financial	University of Alberta
NAIT Industry Solutions	Alberta Agriculture	Crop Pro Consulting
Alberta Machine Intelligence Institute	Alberta AG and Food Council	Telus Communications

12.3 Regional Weather and Climate Lab

This Lab will link the collection of micro area weather information to land use, intelligent farm practices and crop selection and management. It will improve decision making on crops planted, nutrients required to optimize yields, inform management decisions (like when to spray/harvest, etc.) and better plan for daily farm activities. LoRa Sensors are already being deployed around the world for Agriculture purposes and would be assessed for use in the regional pilot.

Real time weather data will be collected at the farm level and linked to regional and national databases. Mapping and monitoring of weather systems will take place and be linked to on-farm support tools. A real time, micro-area weather service will be enabled.

Creation of a large data set that links farm-based decisions to climatic activities, predicting on a much more localized and specific basis short term weather events, and informing better farm decisions will result. *AGora* believes this linking of micro area weather data with existing data sets managed by existing research and commercial endeavors will provide value along the full value chain, as providers of national and regional farm data are interested in delivering greater farm management services and risk reduction to the end user. The end user, in turn will be enabled to benefit from the delivery, analysis and use of their information.

These data also are expected to help model and assess projected regional impacts of climate change and support development of regional strategies to adapt and mitigate the impacts of pending change. As such, *AGora* anticipates involvement by academic, research institutes and government institutions involved in climate response, building regional capacity for understanding, adapting to, and capitalizing on climate change.

"Harvest is in full swing, and it's time for John to head home for the night. His daughter meets him and takes over the combine, which she will run all night – not a problem since the software on the combine has linked the combine's GPS guidance system to satellite data and the hyper-local background moisture data the farm has collected. It tells her where the wet spots in the field are, and what weather may be coming, and ultimately how late she can combine. The system also has linked data from the family's land 20 miles west with information from the quarter she is harvesting, and told her what she needs to know – a specific forecast - to keep on harvesting."

Collaborators, Expressions of Interest and Technology Alignment

Expression of Interest / Technology Alignment		
Sightline Innovations	ATB Financial	University of Alberta
NAIT Industry Solutions	Bell Mobility	Crop Pro Consulting
Alberta Machine Intelligence Institute	SensorUp	3C Information Solutions

12.4 Regional Energy Lab

Evolving out of a question around proper disposition of regional waste will be the delivery of a Regional Energy Lab. Participants confirmed interest in delivering a system that integrates the region's waste management and recycling services into an efficient use of agricultural and residential by-products. Rapid improvements in energy production technologies and economics are steadily creating more profitable opportunities for consumers of fossil fuel energy to become more self-sufficient producers of their own clean energy, including energy from renewable sources such as sunlight, wind and industrial waste. These opportunities are driving an accelerating transition of energy economies from household to global scales, amplified by social and political responses to climate change.

Ag operators and rural communities can exploit these opportunities to improve self-sufficiency and profitability while reducing their dependency on grid power and fossil fuel, reducing their GHG emissions in the process. Solutions for energy are increasingly plentiful, accessible and affordable. The Energy Lab will work to accelerate energy transition throughout the Parkland region, helping regional innovators identify and exploit opportunities to profit from advances in energy technology.

The work of the Energy Lab will include:

- Mapping and analyzing the regional energy economy, including sources, quantities and qualities of industrial waste that can be gasified or incinerated to drive electrical power generation.
- Helping regional innovators build comprehension and competency around energy economics and solutions for community and on-farm energy production and management, by providing online tools for energy-related learning, analysis, modelling and planning; online and onsite learning tours and learning workshops relating to energy solutions and energy transition; and demonstration projects

"Dave just finished putting in a bio-fuel plant on his farm to serve his needs and the neighbouring farmers who invested in the business. By using AGora he identified all the local supplies of lower grade canola and other crops and 'carbon based' materials that could feed a facility like this, identified the most effective technology and confirmed local markets for the bio-fuel.

They found, through AGora, a local entrepreneur with the bio-fuel technology they needed to make their plant successful. Dave now can claim a federal carbon credit, as Canada's Clean Fuel standard provides a financial benefit to 'green energy' producers."

Collaborators, Expressions of Interest and Technology Alignment

Expression of Interest / Technology Alignment		
Sightline Innovations	ATB Financial	University of Alberta
NAIT Industry Solutions	Alberta Machine Intelligence Institute	

12.5 Regional Safety and Security Lab

Mapping, monitoring and mitigating risks to people, livestock and property throughout the region is a growing need. Today urban residents benefit from real time security monitoring and delivery of safety services. This has been enabled through advances in communications technologies not yet in place in rural regions. This Lab will work towards deploying a full network of IT enabled sensors, monitoring systems and integrated products that deliver real time ability to track, maintain and monitor on farm and rural assets.

The Lab also will improve safe vehicle movement across the counties, particularly with respect to large vehicle (farm, municipals and industrial) and significantly reduce the number of collisions between personal vehicles and large industrial vehicles which often move at slower speed and take up much more space on the road.

It is recognized that several enabling actions are required to deliver upon this Lab – broad connectivity must be established to provide the base to monitor farm and rural assets; blanket coverage and data collection ability along major traffic routes needs to be enabled; and linkage to information systems deployed in vehicles must be enabled. Initial implementation will take place through data collection to be enabled through each FAN.

First order work is engagement with research and development institutions involved in issue definition and delivering proof of technology. They exist. The Applied Research Centre - Sensors & System Integration at NAIT, the Centre for Smart Transportation at UofA and Alberta Traffic Safety (corporate) have expressed interest in participating in the design and delivery of this Lab, and the use and development of the data that support the decision-making infrastructure. Significant work is envisaged to fully define the technical requirements, enabling software and partnerships to bring life to this Lab.

"Before heading home for the night John switched on the guidance systems for the grain carts that have been filled during the day. The autonomous vehicles begin their slow drive home, and should be at the granaries by morning. He is not worried since they are fully integrated with necessary road telemetry and traffic information. Crossing several grid roads and a major highway used to be a problem, but now that the county is fully networked and vehicles can receive real-time notification of big machines on the road, it's a safe and efficient process to get the crop home in off peak hours when it's safest."

Collaborators, Expressions of Interest and Technology Alignment

Expression of Interest / Technology Alignment		
Sightline Innovations	Bell Mobility	SecurTek
NAIT Industry Solutions	Alberta Machine Intelligence Institute	University of Alberta
University of Alberta – Smart Transportation	Alberta Traffic Safety	

13. Technologies Supporting Global Research Initiatives

The platform established through AGora will enable the collection and analytics of huge amounts of highly specific information related to rural and farm activities. Thee data will support significant research and development, be it through academia or the private sector.

Collecting hyper-local data in a rural farm context, with leadership from farmers willing to be involved delivers a new approach to research and vette technologies. Data will be created that fully informs how farms are being managed and operated. In addition, in between the lab and full commercial deployment there is the opportunity to deploy real-world trials, collect huge sums of data to inform design decisions, and see how new technologies actually are being used – by the farmers themselves.

"Today is the day that the crop development companies deliver their new seed varieties. Several early adopter farmers are ready to plant highly tailored varieties to see which perform best under "real-farm" conditions. Global research has matched soil type and climatic zone, predicted moisture needs and defined specific nutrient/micro-nutrient requirements in test conditions. Now it's time for farmers with the means to collect huge quantities of information to put these varieties to practical tests. The full sensor networks across the farms will collect data that will inform decisions on genetic improvement, crop support (nutrient, herbicide / pesticide) use and which perform best under what condition, to name a few.

Development companies that are recognized AGora partners benefit handsomely from access to these real-farm conditions and are willing financial partners / contributors to the farms' operations. Huge decisions now rest on the outcomes, as companies can determine which variety works best where, and which hold promise for long term improvement. Thanks to AGora's Data Trust, these companies also have access to the data needed to commercialize their new variety's in other parts of Canada, and the world, with similar characteristics.

14. Risks and Mitigations

AGora's proposed corporate structure inherently manages risk – duties, structure, planning processes, policies, regulations and overall accountability processes both assign responsibility and contain risk. The GOVERNANCE chapter fully articulates roles relative to how projects will be managed, deployed and delivered.

Privacy and cybersecurity breaches will be treated as a primary branch, especially as they relate to devices, network, and data ownership. We intend to partner with experts to address this concern.

Human Safety Related to Autonomous vehicles, and downstream utilization of robotics

Risk – 'Renegade' behavior rooted in the unavailability of sensor and/or component interoperability.

Mitigations – Exhaustive testing related to any, and all, scenarios regarding the dependency of autonomous vehicle 'losing contact' with governing related objects; example connectivity, vehicle/sensor mechanical failure. Continuous operational monitoring of network and exceptions.

Local device shutdown should be programmed on certain conditions; remote shut down should be available and applied. Apply other best practice remedies.

Risk – 'Renegade' behavior rooted in malevolent 'hack', or intrusion, related to vehicle or device.

Mitigations – Multi-factor authentication can be applied to 'control' devices (see Sightline). Detection of attempts to intrude should be logged, examined. 'White hat' hackers can be employed for testing/ongoing. Local device shutdown should be programmed on certain conditions; remote shut off should be available, and applied, on suspicion of takeover.

Reliance on signaling/alerting technologies that are less than 100% available

Risk – Signaling and alerting technologies become mainstream and will gain mainstream adoption. Citizens expect and are guided by their information. They may be sometimes unavailable.

Mitigations – Wherever possible apply a similar solution pattern that is applied to traffic lights. In the example of traffic lights, the red lights blink for all drivers; indicating outage and defining behavior (four way stop). In the example of notification of 'heavy machinery ahead', notify 'may be heavy machinery ahead', until systems are fully operable.

Privacy of Information – Impersonation and Identity Theft related to authentication/access

Mitigations – As described in the TECHNOLOGY chapter, we intend to partner with sector experts to address this fundamental rick. Best practice mechanisms will be implemented based on monitoring, and the detection of suspicious behavior, and emphasis on 'safety first'. 'White hat' hackers can be employed for testing/ongoing. We will define processes to mitigate security breaches that will identify the root cause, those harmed, level of harm, and 'resolution of root cause' actions.

Privacy of Information – Other

Mitigations – The data governance and data management model positions Data Providers to define what data will be available, to what consumers. Best practice mechanisms will be implemented based on monitoring, confirmation that solution is working as defined (no leaks), the detection of suspicious behavior, and emphasis on 'safety first'. 'White hat' hackers can be employed for testing/ongoing. Define process for Security Breach that identifies root cause, those harmed, level of harm, and 'resolution of root cause' actions.

Technology Project Execution – Quality/Time/Budget

Mitigations – Adherence to the architectural principles, and the following checklist are typical mitigation strategies:

- Employ Proof of Concept (PoC) and Building Block concepts.
- Define expertise required and provision the necessary people/partners.
- Define how expertise will work together and optimize the engineering process.
- Define small teams and make them accountable for outcomes within the overall architecture.
- Engage as many full-time, for a period, resources as possible as momentum reinforces persistence.

GOVERNANCE

Different levels of involvement by different groups will unfold. Teams, partners, stakeholders and early adopters will help define success. This chapter describes how the project(s) will be governed. At the core is a new not-for-profit company with the responsibility to link those involved in the most effective way possible, provide operational transparency and align diverse interests in common purpose.

1. A Not-for-Profit Organization

AGora will be created as a not-for-profit corporation to establish clear lines of responsibility, provide operational transparency, incent diverse interests to participate for the common good, and mandate clear financial accountability. Materials supporting incorporation of *AGora* (bylaws, etc.) and the operational design of the organization will clarify its purpose and direction for staff, partners and funding entities alike.

> *AGora* will be created as a new not-for-profit corporation. This model has been chosen with deliberate care.

AGora's Strategy Roadmap defines initial outcomes to be achieved to create an effective GOVERNANCE structure. The key outcome is that its design supports national transferability, effective governance, monitoring and sustainability. The mandate of *AGora*, subject to Board input, is to:

> ***Take advantage of the 'virtual' nature of the internet and its connected technologies to support thriving rural communities.***

The not-for-profit structure delivers a practical framework to:

- Ensure equal representation by the four sponsoring counties: It was deemed impractical to house delivery inside any one of the four municipal structures.
- Establish means to attract corporate participation and financial support: This will create the ability to engage in legally binding development initiatives with private sector interests.
- Incent academic involvement: This will deliver a 'living lab' across significant geographies. *AGora* establishes more than a 'test plot' approach to support research and validate innovation – tested in real time – under highly variable conditions and deliver highly detailed data to support academic processes.
- Frame accountability in ways that are well-understood: The straightforward legal structure will be well-understood by external third-parties, with respect to both delivery and accountability (external audit).
- Provide a means to hire, service debt (if any), set contracts/agreements and receive revenues: This will be a legally enacted entity.

The Objects and Bylaws of *AGora* will reflect this and other key design criteria. *AGora's* legal structure will create a risk management and mitigation framework that provides responsible oversight to fund delivery and assign clear operational accountability.

To prepare this proposal a best-practice review of similar organizations was undertaken. A number of not-for-profit organizations provided materials. The applicants received significant support from TECTERRA (Calgary), a technology innovation support centre that has developed bylaws and operational guidelines that meet and exceed federal/provincial standards. The design of TECTERRA, founded in 2010, has helped to ensure long-term support from both the federal and provincial government. This has informed the proposed *AGora* model.

2. *AGora* Board and Advisory Groups

Board Structure and Membership

It is envisaged that the *AGora* Board will be comprised of members representing each sponsoring county, local farm and rural interests, select for-profit firms, First Nations, communications providers, economic development interests, academia, and federal and provincial government representatives as deemed appropriate. A 13-member board is considered optimal.

The following members of the Design Team that created the Roadmap guiding full implementation have agreed to sit, initially in an advisory role to oversee establishment of the corporate entity, which they will then join as board members:

- John Knapp (retired) - Deputy Minister, Alberta Ministry of Agriculture
- Peter Laffin, Director of Business Development, NAIT Applied Research Centre - Sensors & System Integration, Office of Research and Innovation
- Sarah Leteta - Bison Rancher, Entrepreneur
- Brian Olafson (retired) - Vice-Chair Board of Directors, TECTERRA; Board Member, Cybera; Vice-President, Bell Canada

AGora bylaws will define membership structure in detail.

Board Committees & Working Groups

Initially, the following leadership groups will be created:

- The Finance and Audit Committee, responsible for providing support and advice to the Chief Financial Officer (CFO), monitoring and reviewing the financial performance and internal controls, developing the annual budget, and acting as a point of contact between the Board and the external auditor.

- The Technology Working Group, responsible for providing support and advice to the Chief Technology Officer (CTO) and *AGora* in the development of supporting infrastructure and applied technology initiatives that will deliver immediate benefit from new ICT capabilities for the agricultural sector.

  Major technology projects will require additional analysis prior to confirming investment. Drawing on best practices from similar not-for-profit organizations, the working group will be mandated to provide a rigorous review of development initiatives that includes monitoring and evaluating the strategic direction for programs and activities, selecting applied technology initiatives, placing emphasis on those that will create immediate benefits for the rural economy and assessing and recommending projects for approval by the Board, within the funding guidelines and budget constraints for these projects.

  The overriding consideration for approval of projects is: Does the proposed development have the potential to enhance the economic and social well-being of rural Albertans and Canadians through the improved use of connected technologies?

  The Technology Working Group will include members external to *AGora*. It will be comprised of well-respected, volunteer representatives from industry and the research community who have a background in issues related to *AGora's* mandate.

- A Connecting Peoples Working Group made up of early adopter participants that will focus on priority requirements of the initial group of farms and businesses. They will provide accountability and leadership on stakeholder engagement, and will identify innovative strategies, techniques, or tools that are evidence-based that could be used to sustain stakeholder engagement. This will confirm their interests, provide practical guidance on design of *AGora*, and help to define infrastructure and data requirements from a user perspective.

3. Management and Staff

The Executive Team

The Chief Executive Officer (CEO), reporting to the Board of Directors, will be responsible for translating strategic Board intent into corporate action. The CFO will deliver financial oversight, manage day-to-day financial operations, develop and oversee budgets and deliver audited statements following selection of an external accounting firm.

The CTO will be responsible for defining *AGora's* overall technology strategy and deploying and applying corporate technology assets in the rural / agricultural sector and beyond. Responsibilities also include design of the technology platform to manage *AGora* data, liaison with the Technology Working Group to recommend technology solutions for *AGora* and its partners, and oversight of system operations across the four-county region.

AGora Staff

AGora will be staffed to the minimum level required to ensure success. Full requirements will be defined in the implementation phase. Job descriptions will be created, and positions will be filled.

Staff will take leadership roles in moving four Value Streams forward. Each Value Stream will be supported by a Working Group made up of local stakeholders, partner representatives, subject matter experts and volunteers. The CEO, CFO and Office Manager will be focused on the "Building *AGora*" Value Stream. They will carry the vision and change program forward and report to the Board. They will be accountable for overall governance and operation of the organization.

A full-time CTO and a Solution Architect will focus on the "SMART Information Management and Technology" Value Stream. This will include design and implementation of *AGora's* architecture. They will enable the infrastructure through a series of Proofs of Concept and Pilots and focus on the flow of hyper-local data in response to agricultural challenges. They will work with the Technology Working Group to lever the capabilities and expertise of partners and subject matter experts, ensuring that scalability, privacy and security are primary concerns.

Agricultural Technologists will be responsible for providing front-line support to farmers, transferring technology, and a applying a deep understanding of agricultural challenges in each of the LABs. They will work with the Technology Working Group, hand-in-hand with farmers to gather requirements and a deep understanding of the challenges they face, in parallel with vendors and partners applying innovative technology, testing hypotheses, and measuring results. They will combine technological expertise with a hands-on farm work ethic.

A Communications Specialist will apply their skills to marketing, communication and community engagement, focusing on the "Connecting People Technology and Farms" Value Stream and working with the "Connecting Peoples" Working Group. All staff will be supported by the Office Manager and a part-time Grant Writer who will identify opportunities for *AGora* growth and funding. This person also will work with partners to define required funding and funding sources for more innovation projects.

The intent is to create a 'virtual' organization as much as possible, but modest space will be established for administration and technical support. More may be secured as needed for meetings and for incubator space to support specific innovation projects.

4. Partnerships

Greater value is created in partnership than in isolation. *AGora* is committed to creating partnerships, and will seek to create close working relationships with local producers, the private sector, academia, First Nations, and other groups that share a common interest. The Service Provider Policy Framework will be developed to achieve the outcomes identified in the Strategy Roadmap.

Specific contracts will be established that define deliverables, costs, timelines, control points and oversight, to ensure timely, cost-effective delivery and ensure that the expected value is received. Among other things, this will include project objectives and deliverables, expected impacts, required funding, leveraged contributions, technical approach, plan and milestones, intellectual property ownership, and data ownership.

Infrastructure Partners

Infrastructure partners will include technology, connectivity and internet service providers. Letters of support are included. Infrastructure development partnerships will differ from service development partnerships given the very different revenue potentials associated with success, and the expected challenges in project design and delivery.

Service Development Partners

AGora will provide the enabling infrastructure required to develop and deliver a family of products designed to meet specific needs of the farm and business community. Each solution will be created in partnership with one or more private or academic partners. Partnership structures, revenue models, and risk sharing will be specific to each solution.

Early Adopters

Several groups of farmer and business partners are envisaged. As described previously, early adopters will agree to deploy new technologies across their land base or business. Partnership agreements will define responsibilities and benefits received (such as access to consolidated data and decision-making tools that improve farm practices), revenue potentials, site access, and the like.

Others

AGora will seek to form partnerships with the federal, provincial, and municipal levels of government, First Nations, and others. Financial support from these entities will create new partnerships based on a sharing of risks and rewards linked to success of *AGora*.

5. Operating Principles

Financial Management Principles

AGora financial oversight will be delivered through combined accountabilities of the Chief Financial Officer, the Board of Directors, and the Finance and Audit Committee of the Board. An independent audit firm will be engaged to report on business operations.

Program Management Principles

Program Governance guides delivery of the transformation based on decentralized and distributed decision-making, clear roles and responsibilities, and coordinated systemic planning, problem-solving and learning at the program level. Collective intention will be sustained by *AGora's* organization and the Board. *AGora* will:

- Create high-functioning teams that are self-managed and empowered to make decisions. Employees will be identified with the relevant skills and experience; gaps will be filled where necessary; team commitments will be clearly articulated; and events, information and tools will support teamwork. *AGora* will focus teams on delivering results.
- Develop a high-level plan for strategic initiatives in a release planning process based on ranked outcomes. This blueprint, created by team members, will indicate the order in which initiatives will be addressed and when they will be completed. It also will serve as the baseline for measuring progress.
- Establish frameworks to track team achievement, assess risk, monitor outcomes and remove barriers to achieving results. As described elsewhere in the proposal, performance measures will be identified and aligned with the Strategy Roadmap.
- Sustain dialogue to resolve conflicting perspectives and ensure alignment. Working Groups, teams and stakeholders will create artefacts and events that support ongoing dialogue around the desired future, enabling outcomes, value delivery, actions, and work. This process will be continually monitored and refined, and the dialogue will respond to changing circumstances.
- Use a Lean/Agile structure to underpin the program budgeting process and plan for future work. Approvals will be linked to funding, priorities, expected results, and decision responsibilities. Program management will focus on balancing work-in-progress, team flow, alignment, dependencies, performance, and progress in achieving program goals.

Project Management Principles - the Lean/Agile Approach

Delivery will be enabled using the Lean/Agile implementation framework. Lean/Agile is widely adopted across the technology sector - requirements and solutions evolve through the collaborative effort of self-organizing and cross-functional teams and their customer/end user. In *AGora's* case, implementation teams will emerge from those who have been engaged to develop the Strategic Plan. Additional members, products, timelines structure and processes will develop from this core. Full articulation of the processes can be found in the PROJECT MANAGEMENT chapter.

AGora will coordinate execution based on active Lean/Agile stewardship of the Working Groups and teams, in cycles of acting, learning, and planning. Project management will be organized around the flow of value. Delivery will be achieved through the Agile teams, where all teams have a synchronized set of events, have an Outcome Owner and a Team Coordinator (see section following), and deliver work linked to a roster and a schedule. As the methodology describes, a regular process will be

established for program monitoring, communication, and progress that creates a rhythm for sustained performance. Through the Lean/Agile process *AGora* will:

- Create a culture of trust. Teams will be empowered to make decisions. Information will be shared openly and constructively, and team commitments will be honored.
- Be purposeful in value delivery. Innovating and learning as outcomes are achieved, and as impacts are created. Teams will become increasingly competent in working with complexity.
- Strive for agile delivery based on self-organizing, self-managing and cross-functional teams. Deliver value through prioritized outcomes and user stories. Teams will be synchronized through iterations and team events. Progress will be demonstrated at defined intervals and planning will happen just-in-time.

Risk Management Principles

Risk is exposure to a potentially negative outcome, with an associated level of uncertainty. Risk management seeks to identify the risk in detail, explore ways to address it and have the best approach prepared for possible use. Regardless work area, programs face several common categories of risk:

- Business risk related to a shift in business realities resulting from new market challenges or moves made by competitors.
- Technical risk resulting from evolving technology platforms, adoption of new technologies, and the combination of technologies in new ways.
- Operational risk related to suitability of the solution within the existing organizational ecosystem and the skills and knowledge required for the organization to run and support the solution.
- Process risk that occurs when a technique is used beyond its range of applicability or outside of the organization's comfort zone.
- Organizational risk resulting from changes in reporting structure, dysfunctional politics, competing visions, the social dynamics of transformational change, and other forces.

Performance Measurement Principles

AGora will use the Performance Measurement and Improvement System (PMIS) framework for lean-agile programs to measure, learn and achieve continuous improvement. The framework will be constructed based on the capabilities and outcomes in the Strategy Roadmap that describe the strategy and intention of the program. Appropriate metrics have been chosen that will assess progress that is being made to achieve critical outcomes, and to provide the feedback required for teams to learn and adjust. This is described in detail in the PERFORMANCE MEASUREMENT chapter.

Intellectual Property Management Principles

New intellectual property (IP) will be developed. It will be desirable to protect and commercialize this intellectual property. The Chief Technology Officer will be responsible for defining ownership and how value is realized from its development, either independently or through delivery partnerships.

AGora's Intellectual Property Policy framework will allow for timely, efficient dissemination of new IP, while allowing for its commercialization. *AGora* policy will recognize the respective interests of all funding participants in creating this intellectual property. Benefits are expected to accrue to the creators, *AGora* and other sponsors of the activities that reflect their respective contributions.

Data Privacy

By design, *AGora* will collect and manage data, and will be responsible and accountable for the data under its control. The Chief Technology Officer shall be assigned Privacy Officer responsibilities to ensure compliance. Technology compliance is fully detailed in the Sightline technology architecture; please refer to details provided in the TECHNOLOGY chapter and the CONFIDENTIAL appendix.

6. Letters of Support

We have received fifty-five Letters of Support from a substantial number of key constituents for this project. This demonstrated commitment to work with us has been received from all municipalities in the region (4 partners and 5 additional towns and cities); technology producers; connectivity companies; First Nations; government ministries; agricultural producers; technology accelerators; academic institutions; utility companies; and key volunteers (some of whom have agreed to serve on an inaugural Board as AGora is established). The complete set of letters received is provided as an appendix to this proposal.

7. Risks and Mitigations

AGora's proposed corporate structure inherently manages risk – duties, structure, planning processes, policies, regulations and overall accountability processes both assign responsibility and contain risk. All organizations need a structured and methodological approach to coordinate governance, risk mitigation, and compliance. Risks range from strategic risks in markets and value chains, day-to-day operational risks, and financial risk inside the firm (fraud, breach of contract, etc.) and external (interest rate impacts upon borrowing ability, etc.). Each risk requires an appropriate plan of action.

Compliance requires definition of a process and responsible follow up to ensure risks are minimized, the organization responds appropriately when they occur, and the duty to report is honored. Risk management strategies relevant to key elements of this proposal are defined in each chapter.

Corporate Strategy

Risk – Significant change in the client base, operating environment, markets or revenue may impact *AGora's* long-term ability to function.

Mitigations – Conduct periodic environmental scans with the Board and external stakeholders to re-assess and confirm *AGora's* strategic direction. Evaluate options for corporate renewal based on new realities when circumstances change.

Operational Risk

Risk – Loss resulting from failed processes and systems or from external events.

Mitigation: Identify and manage operational risks, with full monitoring and reporting. Assign oversight responsibility to the Board of Directors. Assign responsibility for compliance to the Chief Executive Officer.

Internal Fraud and Error

Risk – Corporate fraud and malfeasance.

Mitigations – Establish a full suite of financial accountabilities, with responsibility clearly assigned to qualified and capable staff, and with external audit to ensure proper fiscal management. Base policies on best-practice models, including financial governance, signing authorities, roles for audit/finance committees, and controls for financial approvals. Establish transparency for the Board, funding agencies, and the public at large.

Disaster Recovery

Risk – Failure of the technology and data management systems.

Mitigation – Establish and maintain an up to date disaster recovery plan. Define corporate and technology provider responsibilities and describe how operations will be continued in the face of loss of information or systems. Significant work to align data privacy, support providers and staff responsibilities will take place.

Staffing Overload

Risk – Workload exceeds staff compliment.

Mitigations – Seek Board approval and funding for additional resources. Scale back operational activities as required.

PROJECT MANAGEMENT

AGora will deliver multiple projects. Initial work will focus on establishing the company, defining and initiating pilot projects, and building requisite delivery capabilities. Once established a full range of programs, community engagements and values will be delivered.

Full corporate accountability supports overall project management. Staff will manage projects in accordance with Executive and Board direction. The latest and most efficient project management system – Lean/Agile – will be used to deliver project success.

1. Lean/Agile Project Management

Delivery will be enabled using the well Lean/Agile implementation framework. This management approach is widely adopted in technology sectors - requirements and solutions evolve through the collaborative effort of self-organizing and cross-functional teams and their customer/end user. In *AGora's* case, Agile implementation teams will emerge from those who have been engaged to develop the Strategic Plan. Additional members will develop from this core.

Agile development methods break product development work into small increments that minimize the amount of up-front planning and design. Iterations (or sprints) are short time frames that typically last from one to four weeks that deliver that increment of work. Each iteration involves a cross-functional team working to deliver all project requirements. At the end of the iteration a working product is demonstrated to stakeholders. This minimizes overall risk and allows the product to adapt to changes quickly. See also https://www.scaledagileframework.com/agile-release-train for detail. Work within each Value Stream will be based on the following practices, or Agile Release Train:

- The schedule is fixed – The Value Stream will start at a known time and solutions will be delivered in set increments, aligned with other dependencies, on a reliable schedule.
- A new increment begins every four weeks – Each Value Stream will demonstrate its work to users, stakeholder and other teams at the end of each increment. This solution demo will provide a way to evaluate the working solution with all the teams.
- Priorities are revisited and synchronized across all teams every six to eight months – The next increment of work in each Value Stream will have common start and end dates for all teams within it.
- The Value Stream has a known velocity – Team and Value Stream velocity will be determined using estimation techniques and aggregated so the total capacity for work is understood.

AGora will use an iterative process to create a deep understanding of the desired outcomes identified in the Strategy Roadmap, to rank work activities, and to deliver value as the Value Streams are created. Each team will be led by a leader who is accountable for the team process, events, artefacts, and deliverables. Team members will learn and apply practices from recognized continuous improvement disciplines (Scrum, Kanban, etc.).

It will take some time for teams to become fully functional. *AGora* will initiate delivery by contracting a service provider who is familiar with *AGora's* work.

Value Streams

AGora's five-year plan is based on four Agile Value Streams (see FINANCIAL chapter) and associated delivery plans constructed from outcomes in the *AGora* Strategy Roadmap. Each Value Stream will develop solutions that benefit the end user. Work has been ranked and scoped in the five-year plan, attached. Priorities will be assessed further when six-month workplans are developed. Value Stream workplans will be developed through a face-to-face planning event every six to nine months. The status of work underway will be demonstrated and evaluated at that time. Teams and management will identify improvement backlog items in a structured, problem-solving process.

Each Value Stream will be resourced by at least one team, with team skills, experience and capability focused on a key value outcome. Each team will have an Outcome Owner and Team Leader. Each team will deliver solutions focused on ranked business cases approved in a large group workshop. They will be charged with meeting objectives and delivering outcomes in line with the business case.

Six-Month Workplans

Teams will work to achieve six-month workplans. Each team is responsible for its own plan. Dependencies, risks, performance, resources, and specific deliverables will be outlined in each plan. Each team – working with other stakeholders – will incrementally develop, deliver, and (where applicable) operate one or more solutions in a Value Stream. Where multiple teams are assigned to a Value Stream, they will be mandated to plan, commit, develop and deploy together. Teams will be cross-functional and will include all capabilities needed to define, implement, field test, and operationalize solutions.

Team Structure and Roles

Each Agile team will have five to nine people and will be anchored with permanent staff from *AGora* and members of the Design Team. Additional positions will be filled with contract resources, volunteers, or resources borrowed from other organizations. Volunteerism will be considered where appropriate. Recruiting the required skills, experience and expertise will be essential to create a capable delivery engine. Team training and orientation related to each challenge will take place to on-board team members and ensure they are effective.

In the first six months teams might include only two to three people. These people will work together to recruit and find others with the best mix of skills and availability to augment their capability. This recruitment process will be overseen and aided by the new Board and management team. Agile delivery will enable the following positions and responsibilities:

- The Team Leader is a unique Agile team member focused on helping other team members communicate, coordinate, and cooperate. This person will assist the team in meeting its delivery goals. They will act as a servant leader who helps teams self-organize, self-manage, and deliver results using effective Lean-Agile practices. The Team Leader will support and enforce Agile processes and other rules to which the team has agreed. They will coordinate with other teams and will communicate the status of their work to management as and when needed.
- The Outcome Owner will drive individual delivery. They will author each business case and will receive a go/no-go decision on the proposed work. After acceptance the Outcome Owner will work with the Agile Team to deliver all activities required to realize business value. After initiation, the Outcome Owner will

have the ongoing responsibility to steward and follow up with the team on the work. Once the work is completed, the Outcome Owner will turn their attention to the next high-priority action and outcome.

2. Investment Scope, Scheduling, Sequencing, and Dependencies

Project spending and investment decisions will be based upon a full delivery of Agile scoping, scheduling, sequencing and identification of dependencies. This will ensure that risks to project delivery are identified in advance, mitigations developed, and investments approved. *AGora's* Agile delivery and financial oversight methodology will rely upon constructive planning workshops to define work flow, investment requirements and scheduling and team synchronization. At the core will be effective use of funds to deliver the identified product in a timely, efficient and cost-effective way. Please refer to the FINANCIAL appendix for full details.

3. Managing Resources

Human Resources

AGora will seek commitment from community organizations and special interest groups to provide the human capital required to support its work. It has dedicated the Connecting Peoples, Technologies and Farms Value Stream to engaging with the community to recruit, attract and retain resources for Working Groups and Teams.

Infrastructure & Investments

Smart infrastructure projects will provide the foundation for *AGora's* program delivery. Components are connected and generate data that will be used intelligently to create value in the region. The following investments will be made with the smart cities funding:

- Infrastructure Connectivity: *AGora* will invest $1.5M to improve the infrastructure to connect farms through partnership and pilots with new service providers and seek to at least match these funds.
- Direct Economic impacts: *AGora* will spend $5.0M over five years within the communities it is working.
- Social license to Engage and Innovate: *AGora* will spend $0.75M over five years engaging the community in this challenge.
- Improving Farm efficiencies through Technology: *AGora* program will invest and leverage $1.25M to improve farming practices through the application and deployment of Technology solutions.
- Farming Data Investment *AGora* will invest $0.50M to build, analyze and curate the data flow from farms and turn it into an asset.

Financial Resources

AGora will employ a budgeting process that combines annual budget development for ongoing *AGora* operations (staff, overhead, support, pension, etc.) with a 'Lean' budget development approach that supports delivery of project value streams, pilots and specific development initiatives. This alignment will deliver necessary links to outcomes-based project implementation and necessary funding through the Smart Cities Challenge initiative. Full details are outlined in the FINANCIAL appendix.

Procurement Strategy

AGora's procurement strategy is modelled on Agile best practices and will be supported by full oversight provided by *AGora's* Chief Financial Officer. Full detailing of the process to procure materials, labour, etc., for agile delivered projects is identified in the attached FINANCIAL appendix.

4. Managing Stakeholder Engagement

As part of ongoing operation *AGora* will staff and deploy resources as part of the Value Stream – "Connecting People, Technology and Farms", as described herein.

5. Progress Monitoring and Course Correction

Monitoring, controlling, and reporting strategies and checkpoints for contingencies and any necessary course corrections are identified in PERFORMANCE MEASUREMENT chapter.

6. Related Initiatives Already Underway

We are aware of sustained, long term activities underway in the four Counties for some years regarding the installation and commissioning of numerous tower and mobility based broadband improvements. The continued commitment and funding of a Connected Communities Program Manager and the infrastructure they are deploying in Parkland Country is a demonstration of this on-going support. Investment over the past three years is estimated to be $7.6 million (to December 2019), with a combined four-county estimate exceeding $12 million.

We also know that the Province of Alberta is deeply interested in this subject and have announced the completion of a province-wide Broadband Strategy by sometime in 2019. Moreover, Alberta's SuperNet assets have been sold to Bell and they are in the process of determining their provincial wide strategy to capitalize on that purchase.

The proponents have demonstrated a large and encouraging interest in this initiative. They have a full complement of committed volunteer and municipal partners interested in pursuing these initiatives, alongside a substantial number of potential partner organizations – private companies, governments, academic institutions and community groups.

They will be the horse power we will engage with to deliver on the promise of AGora.

7. Sustainability

The proponents will develop methods to ensure, to the extent feasible, the long-term sustainability of *AGora*. This will be needed to ensure the on-going improvements in rural prosperity in the four Counties and will be necessary to effect scalability and transferability to other Canadian rural regions.

New Integral Strategy Labs™ are planned with the Technology Working Group to springboard from what's been learned to date and also to future proof the technology offerings available. We plan two additional Strategy Roadmap™ processes – first with the farmers, the community and the youth participants to build on and accelerate the Rural Culture of Innovation. A second Roadmap™ process is planned with the Board and *AGora's* corporate partners / participants to build on the evolving

business model and to consciously design a more robust "Pre-competitive co-design, co-development model" to accelerate innovation and commercialization opportunities.

Finally, while we are not yet able to estimate the scale of the following, we have identified a number of key on-going revenue streams that will be realized as *AGora* takes root and scales up:

- We have secured, via the Data Trust, the foundation for an on-going revenue stream from the data that will be collected, curated and made available – it is expected this revenue stream will grow substantially over time as the data set becomes larger, more comprehensive and more valuable;
- We will realize advertising revenues from appropriate Banner Advertising that will be sold on *AGora's* Regional Commerce Lab;
- We will, from the onset, negotiate with private companies, a pay-to-participate model to allow their access to our innovative testing environment for the purposes of their developing solutions to hyper-local challenges for *AGora* that also have wide-spread commercial application and value;
- We will negotiate shared Intellectual Property right fees from companies that use *AGora* data and its test bed to develop new products they then commercialize;
- We expect to have *AGora* deliver valuable services on behalf of its County partners which will enable them to avoid delivering duplicates services. We anticipate they will contribute funds to *AGora* for those joint, and more effective, delivery of services; and
- Finally, through the retention of an on-staff Grant Writer, *AGora* will be the recipient of numerous Innovation Grants from a number of governmental and philanthropic sources.

8. Risks and Mitigations

AGora's proposed corporate structure inherently manages risk – duties, structure, planning processes, policies, regulations and overall accountability processes both assign responsibility and contain risk. The GOVERNANCE chapter fully articulates roles relative to how projects will be managed, deployed and delivered. Specific to projects, risks will be identified and assessed, enabling decisions to be made about the extent and nature of appropriate interventions. This will be done with stakeholders.

Interventions

Project risks will be evaluated using a scoring system to assess their impact and likelihood of occurring. There are four possible responses:

- Elimination – Where possible, we will act to eliminate the risk.
- Acceptance – When the severity of a risk is lower than our threshold of risk tolerance, we may decide to do nothing about it unless it occurs.
- Mitigation – When the severity of a risk is above our level of risk tolerance, we will act to reduce its impact or the probability of it occurring. The objective is to reduce its severity below our threshold of risk tolerance.
- Transfer – We may decide to move responsibility for a risk with the potential to impact a project to someone outside of that project. The risk does not disappear, but another party becomes accountable for dealing with it.

Each Team will maintain a Risk Register. Accountability for ensuring risks are appropriately managed will be maintained at the overall program level.

PERFORMANCE MEASUREMENT

Performance measurement is fundamental to understanding when/how/if success is being achieved. The following describes how progress will be measured and reported, and funding enabled.

The Strategy Roadmap underpinning this proposal defines in detail the full range of strategic outcomes to be met over the initial life (5 years) of the company. To deliver these outcomes, *AGora* will:

- Focus on delivering its strategic roadmap by creating long-term goals that define where it ought to go and how to get there
- Understand the environment in which it operates and anticipate how this is likely to change to ensure it continues to meet the needs of stakeholders
- Create a strategic agenda with a future orientation that promotes the long-term sustainability and performance of the organization, aligned with its strategic direction
- Develop business plans that ensure cross-organizational alignment
- Establish a community wellness index to capture the less quantifiable goals like mental health, aging in place and youth attraction.
- Focus on, and measure results and use those results for resource allocation and continual improvement

1. Why, What and How

Appropriate, relevant, aligned and linked performance measures have been established to create a comprehensive Performance Measurement Framework.

AGora's Performance Measures are consistent, integrated and aligned. They deliver clear accountability to achieve results, from senior management to the front-line.

Our approach is based on the fundamental premise that performance measurement, performance management, and the strategic intent of *AGora* must be aligned. The measurement system is simple, spare, and meaningful, and informed by knowledge of how the work of the organization is aligned with strategic intent – answering the questions WHY (what is our purpose?); WHAT (what outcomes need to be produced to achieve it?); and HOW (how will these outcomes be achieved?). From this, specific measures, milestones and payment schedules can be developed, implemented and monitored.

2. The Strategy Roadmap Foundation

The Strategy Roadmap developed by the Design Team is the foundation to the Performance Measurement Framework, and will be further refined in the first implementation phase. Visualizing strategy on a single page, the Roadmap map answers the three critical questions: WHY, WHAT and HOW, with the strategic goal located in the centre of the Roadmap. Impacts linked to achieving the goal are identified on the right. Outcomes that contribute to achieving the strategic goal, and actions required to create these outcomes, are located on the left. Once the Roadmap was done, performance milestones, schedules and payments were linked to the outcomes. They were defined by:

- Identifying outcomes in the map as leading and lagging indicators of performance
- Identifying candidate measures for these outcomes
- Choosing an appropriate metric for each measure

- Defining the process used to collect and report these metrics
- Defining accountabilities for measurement and reporting
- Documenting the chosen measures and their purpose and use
- Identifying requirements for ongoing maintenance including provisions for modifying the framework as strategic direction and business plans change

Accountability is assigned for every action, and implementation is actively managed by monitoring outcomes. Each stakeholder sees where their contributions complement the contributions of others to achieve the strategic goal. The Strategy Roadmap enables an ongoing focus on outcomes during implementation. By bringing clarity to strategic goals and identifying the actions and outcomes required to achieve them, the map define risks and increases the likelihood of delivering results.

3. Design Considerations

Six questions have been considered in designing the performance measurement framework.

1. Where Will We Measure?

Since the objective is to evaluate how well *AGora* is achieving its strategy, we will measure performance across the entire Strategy Roadmap, with metrics in every capability area. Information will be collected and used to assess progress and adjust the strategy to produce the intended results. If an expected outcome is not being achieved, additional actions or a modified approach will be assessed. If outcomes are delayed due to delays in project delivery, the appropriate response may be to add additional resources or adjust a project timeline.

It is not necessary or desirable to measure every outcome. Rather, a subset of outcomes will be measured that confirm progress – including early, middle and late outcomes in the Strategy Roadmap. Early outcomes — the immediate results of an action — will be monitored to see if actions are having the desired effect. Middle outcomes – representing the combined effect of multiple preceding outcomes – will be monitored to verify that *AGora* is on track to develop capabilities needed to achieve its strategy. Late outcomes will be monitored to verify that it is on track in achieving the strategic goal.

2. What Will We Measure?

When selecting metrics, rigor has been balanced with ease of measurement. The objective is to maximize utility while minimizing effort. By their nature, some outcomes are *verifiable*. That is, they are either achieved or not achieved (the intended product is produced or not produced). Other outcomes are *quantitative* in nature and are achieved by degrees. In this case, we can ask how much or to what degree an outcome has been achieved. Where an outcome is not easily measured, we will consider using a surrogate that can be more easily obtained.

3. How Will We Measure?

Measurement options include:

- A management checkpoint that verifies a project has been completed and the expected deliverables have been created successfully
- Quantitative measurement of a variable that specifies the degree to which the outcome has been increased or decreased, has been eliminated, or is being maintained at a specified level

- Survey questions based on well-structured rubrics designed to gather external stakeholder input.

4. When Will We Measure?

Frequency of measurement has been considered. Measuring more frequently increases the effort and cost required to collect, manage and report performance. Measuring less often reduces visibility and introduces delays in taking corrective action where measurement identifies a problem.

5. How Will We Manage the Information?

Performance measurement is not a one-time activity. Systemic change is realized over time, and trends are significant. Measuring over time, we expect to see progress toward achieving early outcomes, then middle outcomes, and finally late outcomes. We will implement a repository that stores performance measurement data for *AGora* that allows us to track these trends.

6. How Will We Report the Results?

Information extracted from the performance database will be reported for different purposes and in a variety of ways. The Strategy Roadmap itself can be used as a communication tool and performance dashboard, highlighting progress and areas where intervention is needed.

4. Realizing Outcomes

To ensure delivery occurs on time, on budget and with competency, a complete financial plan and delivery program has been created. Refer to the FINANCIAL appendix for full details. Core to this is identifying the milestone and deliverables necessary to monitor progress. Summary detail follows, with full links to financial performance described in the appendix.

> A full delivery plan is articulated in this proposal, specific to the development of internal capacity and the delivery of four 'value streams' that bring life to the company and deliver the large number of technology development initiatives identified herein.

Broadly, delivery is divided into two phases:

1. Phase 1 will establish the necessary corporate capabilities to house *AGora* and its services.
2. Phase 2 is delivery and operations, with initial focus on defining and delivering the requisite pilots to enable hyper-local data collection and rural connectivity, alongside data collection, community enablement, creation of the full spectrum of web-enabled services and ultimately monetization of the data and systems created.

   As the end of the five-year period approaches attention will expand to include positioning of the values developed in *AGora* for deployment and adoption on a Canada-wide scale. Refer to the PROJECT MANAGEMENT chapter and the FINANCIAL appendix for full detailing of the work plans, milestones, outcomes and specific phasing.

By way of example, the full set of outcomes, costs and performance measures are provided, below, for Phase 1. Detailing of how the four full value streams will be achieved is outlined in the FINANCIAL appendix, and linked to the phased delivery plan, funding requirements and the milestones/metrics proposed to monitor progress.

Measures: Phase1, The Readiness Phase

In order to move from the state of "Proposal Approval" to a working and functioning *AGora*, a six-month readiness phase is outlined. Its main focus is to launch the organization and establish the change program.

The following detailed plan outlines this program in four iterations. Included in the boxes are Action-Outcome deliverables needed to be delivered to prepare the Value Stream for the next 6 months of work. During Iteration 4 the next large group planning session for the following six-month will be conducted. Phase 1 establishment will be achieved through 4 Agile cycles, each delivering progressively more detail and product. (Larger graphics included in the FINANCIAL appendix)

This phase is expected to take approximately 6 months, with all necessary and well-understood complexities of Agile-framed implementation defining the actual time for completion. This is reflected in the outcomes identified and the costing/revenue receipt processes to be negotiated with Canada that will underpin delivery.

5. Monitoring Progress

Using a measure-to-manage approach will allow *AGora* to respond quickly to results of a performance evaluation. For example, based on a report of positive performance, *AGora* will consider assigning more resources to programs that are generating products of significant and expressed value to stakeholders. Less favourable results, on the other hand, may lead to the decision to cancel a program, or to change a program so it produces outputs that are more relevant to stakeholders. The feedback loop supported by performance measurement enables continuous improvement.

6. Achieving Impact

While a $10M funding infusion will provide *AGora* with significant ability to influence actions across the four counties, many of the longer-term impacts will be influenced by multiple external factors outside of *AGora's* direct control. They will depend on achieving widespread adoption and behavioral change.

AGora recognizes these challenges and clearly distinguishes in the Strategy Roadmap between outcomes that are within the control of the organization and its partners, and much wider societal, environmental, and economic impacts that will accrue through community uptake. The ultimate impact is "*Prosperity in Rural Canada Increases*."

We will take a number of steps to increase community adoption and promote the required behavioral change, including the following:

Promoting Opportunities in a Renewed Agriculture Sector

AGora will promote region-wide, province-wide and ultimately nation-wide discussion of the opportunities linked to a renewed agriculture sector, creating broad awareness and understanding of a new future for rural Canada.

AGora Readiness - Phase 1
Iteration 1 (week 1-6)
Iteration 2 (week 7-12)
Iteration 3 (week 13-18)
Iteration 4 (week 19-24)
Building AGora
Organization
Governance
Operations
Compete the Corporate design of AGora
Validate Business Model
Start the staff hiring process
Incorporate the Organization
Establish AGora Interim Design Group
Approve and Operationalize Bylaws
Approve and Fund Connectivity Pilots
Operationalize Performance Metrics
Prioritize Outcome Backlog
Demo Results
Establish and approve a Service contract to resource first 6 month work plan
Write Job Descriptions for Corporation
Articulate, socialize, train and Establish the Change Program Mechnics
Establish and Monitor partnership agreements and contracts to support Pilots
Standup Working groups
Socialize and Train Working groups in how the Change Program will Operate
Conduct a Planning Workshop
Farm Focused Technology Driven Continuous Improvement
Process
HLP
LABS
Develop Process for Matching Problems and Solutions, Scoping, Funding and Approving PoCs
HLP Data and Solution Findings and Report
Understand and Scope out Hyper local problems (HLP) including data and non/functional requirements
Match HLP, Data, IOT and Partners in LABs and establish a SOWs and a Proof of Concept (PoC)
Prioritize PoC's and Fund 3 for next cycle
Evaluate AG LABS and characterize Vendor Solutions and offerings
Showcase Partner / Vendor Solutions
Enabling Intrastructure
Hyper Local Data
Technical Architecture
Articulate Statement of Requirements (SOR) for the Connectivity Lab
Formalize Connectivity Lab Partnership
Run ISP Connectivity Pilot
Deliver Connectivity Pilot Summary Report
Recruit for the Technology Working Group
Define Data Req to support Hyper-local problems
DEFINE Technology Requirements to support the AGora LABs
Match HLP, Data, IOT and Partners in LABs and establish a SOWs and a Proof of Concept (POC)
Design AGora SMART Architecture
Partner with Service Providers to support the AGora Technical Needs
Evaluate MVT Architecture Options
Establish the SMART Architecture Ver 0.5
DEMO Results
SMART Information Management and Technology
Connecting Community People, Technology and Farms
Engagement
Marketing
Networking
Develop a Brand Strategy
Refine the AGora Value Proposition
Create Communication Collateral
Design and Launch Website 1.0
Conduct Vendor Market Assessment
Formalize Partner / Vendor relationships
Develop the community outreach Program and Roadshow
Recruit Working group Members
Pilot Community Outreach
80

Supporting Early Adopters

Change will be led by those who see a new future. *AGora* will engage early-adopter farmers and business leaders and deliver value for them. They will become advocates for change based on their own experience, testifying how emerging communications technologies, data, and decision tools make farms more productive and profitable. This will broaden understanding and increase uptake.

Delivering Financial Benefits

AGora's business model envisages the collection, curation and monetization of data with and on behalf of the farmers and businesses involved. Direct financial benefits will be delivered in multiple forms (better farm practices, improved decision making, revenues from the use of data provided, etc.). In short, by participating in *AGora* farmers and local businesses will benefit financially.

This is expected to incent participation, enhance the value of the data collected, and increase revenue. A virtuous circle is created. Financial wealth should increase social resilience and collective investment in environmental sustainability – a much larger virtuous circle that underpins prosperity overall.

7. The Performance Measurement Framework

The measurement framework links the capabilities, outcomes and actions defined in *AGora's* Strategy Roadmap to performance measures. Data sources are identified. Key capabilities defined by the Design Team support outcome and measure. As capabilities are established and refined, greater certainty on how their linked outcomes are being achieved is defined through specific measures. In turn, these measures support payment through the outcomes-based approach being piloted by Smart Cities. *AGora* is pleased to be part of this leading-edge initiative to create a project delivery model based upon outcomes, and looks forward to establishing best practices that can be used Canada-wide.

8. Risks and Mitigations

AGora's proposed corporate structure inherently manages risk – duties, structure, planning processes, policies, regulations and overall accountability processes both assign responsibility and contain risk. The GOVERNANCE chapter fully articulates roles relative to how *AGora* will achieve results. While using the performance measurement system is not designed to be onerous, knowledgeable and skilled resources will be required to obtain the greatest benefit. From a business perspective, knowledge of the data structures and familiarity with the analytical and reporting tools will be most important. Competent technical support – particularly in database administration – will be essential.

Reporting performance measurements transparently will make a strong statement about accountability to stakeholders. Transparency will encourage dialogue with stakeholders about opportunities to make *AGora* more effective and will help to encourage a more collaborative effort among stakeholders to improve how it works.

AGORA OUTCOMES
BUILDING AGORA

Roadmap Capability	Key Outcome	Source	Performance Measures
Governance	Independent governance is established	AGora checklist of governance requirements	Progress in implementing independent governance
Governance	The corporate structure and supporting practices are put in place	AGora checklist of structural elements and supporting practices	Progress in implementing structural elements and supporting practices
Governance	Corporate monitoring and reporting is implemented	AGora checklist of monitoring and reporting requirements	Progress in implementing monitoring and reporting requirements
Governance	Performance measurement tools, metrics and processes are established	AGora checklist of required measurement tools, metrics and processes	Progress in implementing measurement tools, metrics and processes
Operations	AGora staff and expertise support long term delivery and growth	AGora checklist of required staff positions and expertise	Progress in implementing staff positions and expertise
Sustainability	AGora is economically sustainable	AGora checklist of sustainability requirements	Progress in implementing sustainability requirements
Scalability and Transferability	AGora is replicable	AGora checklist of required standards, tools and processes to enable replicability	Progress in implementing standards, tools and processes to enable replicability

AGORA OUTCOMES
FARM-FOCUSED TECHNOLOGY-DRIVEN CONTINUOUS IMPROVEMENT

Capability	Key Outcome	Source	Performance Measures
Deliverables	New technologies for data-driven agriculture are used by farmers	AGora checklist of technologies for data-driven agriculture to be implemented	Progress in implementing technologies for data-driven agriculture
		AGora statistics	Adoption trends
		AGora survey	Structured feedback from users on their adoption of technologies for data-driven agriculture, satisfaction levels, and benefits received
Deliverables	Value added agriculture services are integrated	AGora checklist of value-added services to be integrated	Progress in integrating value-added services
		AGora statistics	Adoption trends
		AGora survey	Structured feedback from users on their adoption of value-added services, satisfaction levels, and benefits received
Deliverables	AGora initiatives solve hyper-local problems	AGora checklist of hyper-local problems to be addressed	Progress in defining and baselining the identified problems, matching them with solutions, and deploying solutions
		AGora statistics	Adoption trends
		AGora survey	Structured feedback from users on their adoption of solutions, satisfaction levels, and benefits received
Deliverables	Farms are more productive and profitable	AGora survey	Structured feedback from farmers on changes in productivity and profitability of their farm
		Third-party data	Statistics on farm productivity and profitability
Deliverables	The environmental footprint of farms is reduced	AGora statistics	Waste reduction data
		AGora survey	Structured feedback from farmers on progress in waste reduction
		Third-party data	Regional waste reduction

AGORA OUTCOMES
SMART INFORMATION MANAGEMENT AND TECHNOLOGY

Capability	Key Outcome	Source	Performance Measures
Technology	infrastructure investments fill connectivity gaps in the region	AGora checklist of prioritized connectivity projects	Progress in completing prioritized connectivity projects
		AGora statistics	Visual map showing connected areas of the region and remaining gaps
Technology	AGora is underpinned by state-of-the-art infrastructure	AGora checklist of required infrastructure	Progress in completing required AGora infrastructure
		AGora statistics	Availability statistics
		AGora survey	Structured feedback from users on infrastructure performance, satisfaction levels, and benefits received
Data Integrity	Farm data is collected and used	AGora statistics	Volume of data captured and used, and the nature of use
Data Integrity	AGora data products are valuable	AGora checklist of required data products	Progress in implementing the data products
		AGora statistics	Use of data products by type
		AGora survey	Structured feedback from farmers, partner and vendors on the data products they use, satisfaction levels, and benefits received

Data Integrity	AGora technology supports data-driven agriculture	AGora checklist of required technology	Progress in implementing technology
		AGora statistics	Use of technology by type
		AGora survey	Structured feedback from framers on the technology they use, satisfaction levels, and benefits received
Deliverables	AGora provides an R&D Environment	AGora checklist of required functionality	Progress in implementing the required functionality
		AGora statistics	Nature of R&D, number of R&D hours, and AGora capabilities used
		AGora survey	Structured feedback from researchers that they have the capabilities they need, satisfaction levels, and benefits received

AGORA OUTCOMES

CONNECTING PEOPLE, TECHNOLOGY AND FARMS

Capability	Key Outcome	Source	Performance Measures
Collaborators	AGora creates a network of collaborators that includes First Nations, environmental groups, Provincial and Federal Government, the private sector, social sector	AGora statistics	Number and type of collaborators, trends, and the nature and level of their collaboration
		AGora survey	Structured feedback from collaborators on their motivation to collaborate, the nature of their collaboration, satisfaction levels, and benefits received
Collaborators	AGora partners are recruited, trained and serve as Ambassadors	AGora statistics	Number and type of partners, trends, and the nature and level of their participation
		AGora survey	Structured feedback from partners on their motivation to partner, the nature of the partnership, satisfaction levels, and benefits received
Collaborators	AGora attracts champions and early adopters	AGora statistics	Number and type of champions and early adopters, trends, and the nature and level of their participation
		AGora survey	Structured feedback from champions and early adopters on their motivation to enroll, satisfaction levels, and benefits received
Marketing	AGora attracts new users to its programs	AGora statistics	Number and type of users by program, recruitment trends, volume of use
		AGora survey	Structured feedback from users on their motivation to connect with AGora, satisfaction levels, and benefits received
Marketing	The community engages with the AGora program and is involved in its implementation	AGora statistics	Human resources shared, physical resources shared, funds committed to initiatives
		AGora survey	Structured feedback from community members and organizations on the nature of their involvement and their intention to become involved
Marketing	Success stories are routinely communicated to the AGora network	AGora statistics	Communication materials developed, frequency, communication channels used
Marketing	There is broad awareness of AGora's mission and accomplishments	Web statistics	Website visits, product downloads, number of followers on social media
		AGora survey	Structured feedback from community members, partners and prospects on their level of awareness of the AGora and its accomplishments

AGORA IMPACTS

REGIONAL BENEFITS

Domain	Key Impact	Source	Performance Measures
Economy	The regional economy is strengthened	AGora survey	Structured feedback from farm operators and regional businesses
		Third-party data	Regional economic growth, employment statistics, new business creation
Community	Community is strengthened	AGora survey	Structured feedback from community members
		Third-party data	Community demographics, key social indicators
Environment	Environmental quality is improved	AGora database	Aggregated farm data
		Third-party data	Key environmental indicators
Food Security	Food security is increased	Third-party data	Annual cost of food for the average family in the region

DATA AND PRIVACY

AGora will create and securely manage data on behalf of all data providers. Significant effort has delivered what we believe to be the most effective means to protect these data. Protecting it in ways that build confidence by data providers that the data are, in fact, protected, and providing a fully secure means of supporting use of the data by multiple end users.

Key issues related to open data, sensitive data, data security and data monetization on behalf of the data providers, and others, are outlined in this chapter, the TECHNOLOGY chapter and the TECHNOLOGY confidential annex.

1. Integration of Security and Privacy Considerations in Project Design

AGora will become a Data Trust enabler, working with data producers and consumers to help them to reap the rewards and value from their data assets while contributing to regional and national understanding of Canadian agriculture. Deployment will position the four counties as global leaders in managing and using agriculture data. Further, this platform will deliver system security, control over assets and will assure privacy of materials held.

A Trust in the traditional sense of the word is a three-party relationship in which an asset or value is transferred from a Grantor to a Beneficiary through a Trustee. This “three-node” network creates a trusted relationship between the parties whereby assets can be shared or transferred based on the governance rules of the trust.

A Data Trust takes this concept further and establishes a governance framework – an architecture and supporting technology infrastructure to enable sovereignty and ensure trust related to the data and derivative data assets. It provides a framework for stewardship over these assets for the benefit of the people or organizations in the Trust. Members of the Trust have control and sovereignty over their data assets and relationships between data partners.

The Data Trust includes deployment of distributed software infrastructure that enables data partners to securely share and exchange data with proper equitable and transparent policies and governance structures, while creating a fair balance of power and control between those who produce the data (citizens and clients) and those managing the infrastructure, or processing and using the data.

Importantly, the technology deployed enables control and flexibility in rules and guidelines. It is not prescriptive in forcing specific governance methodologies, nor does it force any data localization methodologies. Members of the *AGora* Data Trust will establish the terms under which data will be used, shared, generated and monetized to meet their needs.

2. Guiding Principles for Data

Data governance is one of the most important public policy issues of our time. Data is the new enterprise currency. It is ubiquitous, and data stockpiles are proliferating. Data collected by the private sector and governments underpins decision-making and boosts economic productivity and

competitiveness. Protection of this data is central to our long-term prosperity and the preservation of public trust across society.

Data Governance

When data is properly governed, a fair balance of power and control exists between data producers and those who manage technology infrastructure, processing, and/or deployment capabilities. More specifically, an open, transparent and robust Data Trust is required to reap the economic and social prosperity benefits from artificial intelligence – a game-changing invention in which Canada has played a leading role. On a national level, Canadian data should be governed by Canadians.

A Data Trust helps ensure data belongs to and is governed by those who create it. It establishes a governance framework, an architecture, and the supporting legal and technological infrastructure required to enable sovereignty and ensure trust over the data and derivative data assets. It provides a binding framework for stewardship over the data assets for the benefit of the people and/or organizations in the Trust.

Data Accessibility

The Sightline Innovation Data Trust (SID) is the only Canadian artificial intelligence software that creates a circle of trust for data. It enables flexible, transparent, and precise policy definition for all data shared among partners. Additionally, it will provide compliance assurance of policies for both data exchange and data usage. It manages membership changes and policy updates in a Trust while ensuring authenticity of messages and members within the Trust. Lastly, it manages remuneration and value transfer of data that is processed and exchanged between producers and consumers.

Data Security

Included in the governance structure of the Data Trust is the requirement to use industry best practices for data security. The Trust also ensures that all legislative requirements regarding data and privacy, both provincial and federal, are met.

Consent

Consent is integral to the Data Trust. All members, by virtue of being part of the Trust, consent to the terms and governance structure of the Trust. Furthermore, the Data Trust will provide distinctions in governance between data and personal information to provide additional layers of consent.

Data Minimization

Data minimization is typically practiced outside of a Data Trust to limit or reduce exposure to data misuse and/or theft. The Data Trust allows members to maximize their data production in a sovereign and secure manner for monetization purposes. Data is disseminated to consumers (researchers, the private sector, members of the Trust, etc.) to extract value through a secure channel that supports effective data standards, compliance, security and auditing.

Data De-Identification

The Data Trust technology creates synthetic datasets to ensure complete privacy. This creates anonymized features of the real data for analysis – not traceable to individuals or companies. This can

be done at the farm level and shared within the trust. Full audit trails and tracking of data usage and derivative data usage within the trust is possible through a distributed ledger and smart contracts.

3. Management of the Data Life Cycle

The Data Trust technology creates an agreed upon structure for management of the data life cycle (creation, storage, use, monetization, derivative data creation and use, derivative data monetization, etc.). Specific details governing the data life cycle will be established in conjunction with members of the Trust. This ensures the structure of the Data Trust meets the needs and goals of the members as well as addressing any local requirements. Industry best-practices will guide governance development and inform the processes used for data life cycle management.

The design architecture contemplates and addresses key concerns linked to data collection, analysis storage and transmission, to name a few.

4. Open and Big Data Strategies

Open data is important for innovation. It also is an important part of building trust with citizens. *AGora's* data trust does not force specific governance rules – it will build them with the data providers. Therefore, closed data, open data or hybrids of the two are all compatible with the trust architecture. In fact, Data Trusts enable open data to be executed properly and at scale. Additionally, Data Trusts enable data to be verified prior to being made open and allow the use of that data to be tracked. As a consequence, open data is stronger and more scalable.

5. Compliance with PIPEDA and Other Privacy Regimes

Jurisdictions like India and the European Union have sought to cement data and citizen's rights to privacy as a "fundamental human right." Data movement and control of data has been a leading public policy priority for Europe for nearly a decade, culminating in development of the General Data Protection Regulation (GDPR). Countries have recognized the growing conflict between the value of data and individual privacy and consent. According to the European Commission (EU), by 2020 the value of personalized data will be 1 trillion Euros – almost 8% of the European Union's GDP.

The Canadian Federal government is forming a National Data Strategy. Data use and privacy are defined in the Personal Information Protection and Electronic Documents Act (PIPEDA), the Canadian law relating to data privacy. This governs how private sector organizations collect, use and disclose personal information in the course of commercial business. The General Data Protection Regulation (GDPR) came into effect in Europe on May 25, 2018. This is viewed as a significant update to traditional data regulations, for it defines basic rights for an individual (the "data subject") over their personal data. This has put much greater control into the hands of users and more accountability on businesses that violate the legislation.

The Data Trust enables the participants to define access to data, whether it is personal or non-personal. It does not prescribe or presuppose any rules or regulations. The proposed technology-based solution will establish the means through which GDPR or other regulations are automatically enforced.

6. Transferability and Replicability of Technologies and Projects

The Data Trust is readily scalable. Other groups in different geographies can be added as a node to *AGora's* Data Trust. Alternatively, the Data Trust can be replicated for other regions so there is alignment in terms of data sovereignty and the freedom to meet local and/or provincial requirements. Regulations around food inspection, for example, may differ between provinces. This could impact goals or user requirements of the Data Trust in other regions.

7. Risks and Mitigations

Of fundamental importance is the protection of data and related privacy of information. *AGora's* proposed corporate structure inherently manages risk – duties, structure, planning processes, policies, regulations and overall accountability processes both assign responsibility and contain risk. The GOVERNANCE chapter fully articulates roles relative to how data security will be managed, deployed and delivered. Central to this are the staff that will be employed – the CTO and others – and the several Policy Frameworks identified in this proposal that will be created in support.

This chapter describes in full both the technology providers proposed for partnership, their security structure and the technology base inherent that will protect data. Central to this is the Data Trust. Guiding Principles establish the foundation upon which risks will be identified, managed and mitigated. Disaster recovery plans, data security, and other will be built from this base, vetted by Executive and ultimately approved by the Board where appropriate.

FINANCIAL

In line with the competition guidelines, a budget has been developed that will fully invest upwards of $10M to be made available over a five-year delivery period.

The following budget detail is provided by phase (establishment/operation), value stream, and year. Value streams are modelled on Lean/Agile methods, and key initiatives grouped thematically.

1. Project Budget

During the first five years, work will be delivered in two broad phases, with Phase 1 delivering necessary corporate capabilities to house *AGora* and its programs. Phase 2 is delivery and operations, with initial focus on defining and delivering the requisite pilots to enable hyper-local data collection and rural connectivity, alongside data collection, community enablement, creation of the full spectrum of web-enabled services and ultimately monetization of the data and systems created.

As the end of the five-year period approaches attention will expand to include positioning *AGora* for deployment and adoption on a Canada-wide scale. Refer to the PROJECT MANAGEMENT chapter and the FINANCIAL appendix for full detailing of the work plans, milestones, outcomes and specific phasing.

Approach

Delivery will be enabled using the well understood Agile implementation framework. This proven approach is widely adopted - requirements and solutions evolve through the collaborative effort of self-organizing and cross-functional teams and their customer/end user. In *AGora's* case, Agile implementation teams will emerge from those engaged to date, with the Strategic Plan, Strategic Design team and consultants involved establishing the core members that will create the company. Members, products, timelines structure and processes will develop from this core.

Significant financial detail is provided on Phase 1 - establish *AGora* corporate operations. This is intentional, as this is the first most critical phase. Moreover, once a Board of Directors and an Executive Team are in place, they will be expected to take an active role in defining how the following work will be achieved, in accordance with this initial plan.

Phase 1 establishment will be achieved through 4 Agile cycles, each delivering progressively more detail and product. This phase is expected to take approximately 6 months, with all necessary and well-understood complexities of Agile-framed implementation defining the actual time for completion. This is reflected in the outcomes identified and the costing/revenue receipt processes to be negotiated with Canada that will underpin delivery.

Phase 2 will maintain the Agile approach and philosophy. Delivery cycles will be defined and delivered to the newly constituted Board and Executive in advance of approvals to proceed.

2. Financial Management

Fiscal oversight will be provided first through existing administrative support of Parkland County. Once *AGora* is established, a Chief Financial Officer will be employed and deliver Generally Accepted Accounting Principles (GAAP) processes to establish full financial accountability, including audited financial statements.

Budget Structure – Value Stream Summary

The following budget summarizes investment by delivery Phase and Value Stream.

Value Stream	Phase 1	Phase 2	Total
Building *AGora*	2.4%	54.0%	56.4%
Farm Focused Technologies	0.3%	5.7%	6.0%
SMART Information Management	4.3%	26.3%	30.6%
Connecting People with Technologies	1.1%	4.5%	5.6%
Sub-total	8.1%	90.5%	98.6%%
Total hardware (all phases/streams)			26.2%
Tax on hardware			1.3%
Total			100%

The FINANCIAL appendix attached provides full detailing on cost elements that are defined along the four Value Streams. These Value Streams consolidate functions into delivery requirements and deliver cross functional alignment.

1. Activities associated with establishing, staffing and running the company are grouped into "Building *AGora*" Value Stream.
2. Activities related to on-farm capabilities are housed in the "Farm Focused Technology" Value Stream,
3. The "SMART Information Management & Technology" Value Stream identifies all cross functional requirements to establish and maintain the systems that will underpin *AGora*, data trust and data oversight, as well as architecture design requirements.
4. The final Value Stream – "Connecting People, Technologies and Farms" lays out specifics on how community engagement and understanding will be achieved.

Building AGora

This Value Stream is the core of *AGora*. It will deliver the organization that will anchor, lead and oversee all *AGora* work, including corporate design, organization, governance and operations. Initial work focuses on creating the company, defining bylaw, operations, policies, etc., that set *AGora* on a positive course. Operational costing reflects what is expected of a new firm – Human Resource, governance and operational requirements to deliver, pursuing additional partnerships and revenue sources and the like.

Farm Focused Technology Driven Continuous Improvement

This Value Stream is the critical connection of *AGora* to the farms, farmers and communities that are volunteering as early adopters. It will establish the requisite capabilities for on-farm data collection and support software design and delivery through the first five years of *AGora* operations. Through discussion with early adopter farmers, the specific hyper-local challenges will be identified, appropriate data collection systems modelled and put in place, and a process to derive value from the data collected will be defined.

Fundamental to the success of this value stream is the participation of the early adopter farmers, proper framing of the problems to be addressed and the development of decision support tools that will flow back to the farmers to improve on farm decision making.

SMART Information Management & Technology

This Value Stream is *AGora's* technological backbone with three main themes: Connectivity infrastructure, hyper-local agricultural data and SMART architecture This value stream consolidates the technology requirements to both establish *AGora* (GIS systems, etc.), pilots that will determine how other infrastructure (electric/gas) can be effective delivery agents for connectivity, data cleanup and overall proofs of concept tied to software that will deliver value to the data providers and beyond.

Connecting People, Technology & Farms

This Value Stream is the key connection between *AGora* and the community at large. It will establish *AGora's* brand and key value statements. Networking, marketing and engagement underpin activities. Delivery of a community engagement, community outreach and leadership development process is framed in this section. Branding, web management and social media are costed into this stream. A full marketing plan has been developed that will underpin initial activities of this stream.

3. Budget Structure – Annual Investment Summary

Value Stream - Theme	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Building *AGora*	$ 794,050	$1,188,100	$1,254,603	$1,216,643	$1,189,234	**$5,642,629**
Farm Focused Tech Continuous Improvement	$ 56,000	$ 100,000	$ 127,500	$ 155,000	$ 160,000	**$ 598,500**
SMART Information Management and Tech	$ 420,000	$ 630,000	$ 685,000	$ 675,000	$ 650,000	**$3,060,000**
Connecting People Technology and Farms	$ 159,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	**$ 559,000**
SUB-TOTAL	$1,429,050	$2,018,100	$2,167,103	$2,146,643	$2,099,234	**$9,860,129**
Hardware - All Streams	-	-	-	-	-	**$2,623,00**
Applicable taxes						**$ 131,150**
TOTAL	14%	20%	22%	21%	21%	**$9,991,279**

The above table describes the investment to be made in the first five years of activity. Overall, approximately $5.64M will be directed towards establishing human resource capacity across the four counties and to deliver programs. Fully defined on farm investments that will enable state of the art connectivity and data collection comprise approximately $0.60M. In addition, *AGora* will invest approximately $3.06M in technology design, proof of concept and technology development. Investment in community awareness, capacity development, and engagement accounts for an additional $0.56M. On balance, approximately 20-22% of total investment will occur each year, with relatively less required in Year 1. (Please note that summary detail in Section 5 details investment by infrastructure type, not Value Stream)

4. Methods, Sources and Assumptions to Deliver Confident Cost Estimates

Identification and compilation of required costs to deliver upon (1) the initial proposal; and (2) the strategy defined by *AGora's* Design Team was a core requirement of contracts tendered under the $250,000 grant to develop this proposal. Each contract included a costing exercise, ranging from delivery of a long-term marketing plan, infrastructure to enable connectivity across the four counties, the various pilots and labs, to staffing and operational support. Details of these contracts are provided in the following section, Reporting on Use of the Finalist Grant.

Specific contracts defined the organizational structure required to implement *AGora*, including human resource, operating and core infrastructure costs and additional policy/design requirements. Costs, implementation design, partnerships, and timelines were developed for the proposed pilots and labs. Overall, level 2 (at a minimum) cost estimates were provided through contract.

- Infrastructure Deployment & Requirements: Taylor Warwick Consulting Ltd. summarized broad costs for full connectivity and delivery.
- Initial Corporate Creation: Integral Strategy Network Inc. defined required elements to take the strategic design from concept to reality over the first delivery phase of the project. The strategic roadmap defined the core elements for *AGora* creation. Each element was costed in consultation with sector experts, both internal and external to the firm.
- Marketing and Community Engagement Plan: Kumpula Design Inc. delivered a full marketing and communications strategy for *AGora* creation and implementation.
- Annual HR, Operating and Deployment Costs: Integral Strategy Network Inc. defined the annual cost of operating *AGora*, based on design considerations identified by the Design Team. Core delivery requirements inside *AGora* were developed based upon outcomes defined in the Strategy Roadmap. Input from organizations of a similar scale, like TECTERRA, were benchmarked.
- *AGora* Technology Platform: Ventus Development Services Inc. confirmed GIS as a core component of the technology platform. Discussion with ESRI Canada and others confirmed that this platform could be implemented, and the cost of its implementation and operation. Costs were cross-verified by Ventus and ISN prior to our including them in the financial plan.
- *AGora* Data Trust Enablement: Integral Strategy Network Inc. discussed Smart Cities Challenge conditions related to privacy and security with technology experts and confirmed costs required to host, manage and support secure tracking and monetization of data in a data trust environment ensuring the appropriate protections are in place.

- Infrastructure Pilot & Implementation: Ventus Development Services Inc. defined technology requirements, development partners, costs, timing and risks associated with a series of pilot projects *AGora* will deliver. These initiatives have been included in *AGora's* roll-out plan.
- Consolidation and Alignment: All cost elements were brought together by Integral Strategy Network Inc. as part of this proposal development process. Key cost elements were vetted for consistency, accuracy and applicability and integrated into the budget and the workplan.

5. Contributions from Other Sources

Significant support for *AGora* has been obtained from external sources. Fifty-five letters endorsing the proposal gives confidence to the proponents of core viability, private sector interest in moving forward in alliance, academic support, and overall interest in cost sharing and participating in future activities.

Support is broadly aligned with the implementation process, with firm external support in place to establish *AGora*, to be confirmed once the company has been established.

Support to Establish and Maintain the Corporate Structure

Specific financial and non-financial contributions underpin initial establishment. Significant work is required to create the company, as identified in the GOVERNANCE chapter, to deliver the central outcome of "*An effective delivery structure is established*." To this end, a stakeholder group will be created, and they ultimately will form the core of the Board of Directors. Each has indicated interest and is willing to provide in kind time and effort in support. These efforts are estimated as follows:

- 2 Board meetings/month for 9 months and then 4 per year thereafter = $153,000;
- 1 Technology Working Group meeting/month for 9 months and then 6 per year thereafter = $148,500.

Parkland and participating counties have agreed to provide logistical and administrative support to establish *AGora*. This includes significant effort by Ms. Barb Scully, who will maintain her role of lead project coordinator, salaried through Parkland County. Administrative and accounting support also will be provided.

- These contributions are estimated at $130,000.

Integral Strategy Network Inc. (ISN) will deliver corporate establishment and work in partnership with the emergent Board of Directors, the respective counties, other consultants as required, and legal firms to 'stand up' *AGora*. ISN has been involved since inception, and discussions confirm ongoing interest in maintaining continuity in support. ISN has committed to providing support at a reduced cost (50% discount) that recognizes the future potential of *AGora*.

- This contribution is estimated at $441,500.

Technology Providers for AGora Operations and Infrastructure Pilots

Technology providers have indicated interest and confirmed support. Most significant, four energy utilities will provide time and effort in support of proofs-of-concept through the Regional Connectivity Lab pilot projects. FortisAlberta, EQUS REA Ltd., ATCO Gas and Zayo Group have all confirmed their interest in participating in pilot initiatives to assess how their existing infrastructure can be used to support broad deployment of rural communications technologies. **This is considered a fundamental**

achievement. The ability to collect and move information cost-effectively in a rural region is essential. *AGora* will determine how this will be achieved through the participation of these companies.

Other technology providers have confirmed interest in helping to establish *AGora* core operations. Both ESRI Canada Inc. and Sightline Innovation Inc. have expressed interest. Sightline Innovation has offered their family of Data Trust platform technologies and has confirmed the participation of their Chief Technology Officer, Dr. Mark Alexiuk, in the Technology Working Group. ESRI Canada has offered their family of GIS technologies. Future discussion will fully define each of their respective roles. Niche vendors exist that offer translation from Latitude/Longitude co-ordinates to Premise ID, the foundation of location for Livestock and Poultry movement.

- Detailed discussion between the project proponents and Sightline Innovation Inc confirmed their support. They will provide $100,000 in kind contribution towards the project.

Technology providers/research interests; data access and software development

Numerous firms have confirmed interest in participating with *AGora* in design and delivery of software tailored to a rural agricultural clientele. A number of Application Labs will be initiated in partnership with private sector interests, academia and government. This will enable the Labs and deliver decision support and other tools necessary to take full advantage of the data to be managed by *AGora*. These Labs will be established later and, no fixed cost, fixed price, or fixed amount of external contribution has been assessed at this time.

- Detailed discussion between these companies and the Parkland Smart Connected Communities Program Manager in the development of this proposal has conservatively estimated the value of these contributions at an additional $10M.

6. Tools Utilized

AGora will receive accounting and administration support from Parkland County, as noted above. Its accounting systems and practices are compliant with Canada's Generally Accepted Accounting Principles. They have been vetted by Alberta Municipal Affairs. Furthermore, we have included in *AGora's* budget professional accounting services and Annual Audited Financial Statements.

We also will ensure we are fully compliant with any Contribution and Reporting agreements required by Infrastructure Canada and the Canada Revenue Agency, should our proposal be successful.

7. Reporting on Use of the Finalist Grant

To develop and deliver a successful proposal the Smart Cities Challenge provided $250,000 to Parkland and its partners. All funds were used directly in support of this proposal. Five contracts totaling $250,000 were released through an invitational tender process to secure the best proponent and link products to required outcomes that now drive the proposal itself. Proponents were selected in fall 2018, and contracts were developed to deliver specific project components, based on Smart Cities Challenge design criteria. Contract oversight was provided by Parkland County's Connected Communities Program Manager, Ms. Barb Scully, with contract administration provided by Parkland's financial administration office.

The following table summarizes the use of funds.

Tender Recipient	Select Deliverables
Integral Strategy Network Inc.- $50,000 - September 27, 2018 - Sustainability Strategy	Create a long-term strategy that would see the incubator be successful and expanded beyond our region after the initial development to include and be available to all areas of rural Canada. Look at opportunities that will create a financially sustainable future for the Incubator past the award dollars being used. Create a list of stakeholders and what their contribution could be towards the sustainability of the Incubator.
Ventus Development Services Inc. - $50,000 - September 28, 2018 - Virtual Ag Incubator	Develop a mandate and role for the organization. Review and assess similar global centres for Ag innovation. Define necessary conditions for success, organizational design, partnerships to be engaged, competitive advantages to be sought, staffing, applications and platforms required to be delivered and capital/operating requirements to bring life to the initiative. Define broad timelines for implementation.
Kumpula Design Ltd. - $50,000 - September 27, 2018 - Marketing and Communications Plan	Deliver a series of community events to continue and enhance the Smart Cities community engagement efforts accomplished to date. Further engage residents and businesses to gather input into the design of the Smart Cities Strategy, and components of the Living Lab. Build widespread understanding of what will be possible as the Parkland Smart Community plan continues to be fully implemented. Deliver an effective, long-term outreach plan to keep residents informed throughout the implementation phase will be needed.
Taylor Warwick Consulting Ltd. - $50,000 – September 27, 2018 - Infrastructure Assessment and Plan	Deliver a complete review and gap assessment on the installed broadband infrastructure in all participating Counties. Recommended approach to resolve gaps and recommendations regarding core technology choices to deliver equitable internet/cellular access for residents and businesses in the region. Summarize broad costs for implementation and delivery.
Integral Strategy Network Inc. - $50,000 - 27 September 27, 2018 - Strategy and Final Application	Form and brief Strategy Roadmap design team; build strategy. Conduct “information interviews” to obtain opinions from those influencers who need to be consulted (as required). Ensure regular input and communication with and from the other consultant teams and Parkland County’s Project Manager. Develop, coordinate and consolidate information from other teams. Develop overall Smart Cities Challenge submission.

8. Risks and Mitigations

AGora’s proposed corporate structure inherently manages risk – duties, structure, planning processes, policies, regulations and overall accountability processes both assign responsibility and contain risk. The GOVERNANCE chapter fully articulates roles relative to financial management and control will be delivered.

IMPLEMENTATION PHASE REQUIREMENTS

This chapter describes plans to meet applicable municipal, provincial, and federal reporting and legislative and policy requirements. Much is formative, and will be actioned following selection.

1. Compliance with Reporting, Legislative and Policy Requirements

As AGora is not yet an incorporated entity it is not in violation of any municipal, provincial or federal laws, regulations or policies. As a matter of doing business, AGora will ensure the requirement for compliance with these rests with the Board along with a formal responsibility placed on the AGora CEO and CTO to ensure these are monitored and complied with over time. We have also established a relationship with Service Alberta to advise us and to assist in this regard. Once operational, AGora will identify and establish similar relationships with appropriate municipal and federal entities.

2. Duty to Consult with Indigenous Groups

Recognizing that the region's agricultural lands were originally those of the Indigenous people *AGora* will take extra care to ensure they have the opportunity to provide input and influence the initiative – during the proposal phase as well as moving forward. This will include recognition of rights, respect, co-operation, and partnership with our Indigenous neighbors.

In forming this final proposal, we engaged Enoch Cree First Nation and Paul First Nation as future collaborative partners and have received letters of support from both Nations' Chiefs. We have identified that *AGora* had several agriculture areas that will support goals of partnering with the Nations in areas such as food security, education, technology and connectivity. Upon awarding of the Smart Cities Challenge prize, we will extend our engagement to all Indigenous communities in our region as well as the urban Indigenous community in neighbouring towns and cities.

We also have created a collaborative relationship with the Metis technology business 3CIS. 3CIS specializes in rural connectivity with a history of working in rural municipalities and First Nations communities, as well as a background in software and technology solutions. We also have consulted with the Technical Services Advisory Group (TSAG), a not-for-profit provider of technical and advisory services for First Nations in Alberta. TSAG is mandated by the Chiefs of Alberta and takes direction from a Chiefs Steering Committee and Board of Directors, which include representatives from Treaty 6, Treaty 7, and Treaty 8.

Modern Treaty Obligations

We are not aware of any modern treaty rights applicable to this region.

Reconciliation and strong and sustainable communities have been discussed in outreach conversations with neighbouring First Nations. *AGora* is committed to these objectives as a basic principle and will works towards these ends in its delivery, in its full implementation and roll-out of initiatives.

3. Community Employment Benefit (Employment and Procurement Opportunities)

If awarded the $10 million, *AGora* will participate in the community employments benefit initiative. As a region we recognize that increasing employment opportunities is a win for all – including helping to employ the underemployed, creating a regional knowledge workforce that can become sustainable and successful, and creating more opportunities for small, medium and social enterprises. By creating a target and an implementation framework we have the means to grow the local economy while participating in the larger global economy.

According to the government of Alberta (https://investalberta.ca/industry-profiles/agri-foods/)

"Alberta offers a high-quality supply of primary products and is the third largest exporter of agri-food products in Canada. In 2017:

- *Alberta exports of primary and processed agricultural and food products totaled $11.2 billion.*
- *Alberta produced 33 percent of Canadian wheat, 32 percent of canola, nearly half of the nation's barley, and 16 percent of Canada's oats*
- *Alberta led the nation in cattle and calf inventory, accounting for more than 40 percent of Canada's total*
- *Alberta's agri-food industries employed 75,100 Albertans: 52,100 in primary agriculture and 23,000 in food and beverage*
- *Alberta's food and beverage processing industry was the second largest manufacturing employer in the province in 2017, employing 23,000 people, and accounting for $14.4 billion in manufacturing sales."*

Given these statistics we know *AGora* can increase employment opportunities for Indigenous peoples, women, and youth; and procurement opportunities for small-sized, medium-sized and social enterprises. We will establish an outreach program to make these opportunities known to these segments in the four counties.

In the phased approach we will take in developing *AGora* we know we will see an increase in training and employment opportunities for the listed groups. As *AGora* begins to grow in both scope and users, we expect it to attract new agri-food opportunities and larger private enterprises.

There is opportunity for under-employed people in the region from the cottage industry processor to larger facilities. Through *AGora* support we can grow agricultural production for women in agriculture and transfer agricultural opportunities to youth with succession planning. There also will be multiple procurement opportunities for goods and services provided by small, medium, and social enterprises.

AGora Innovation Labs are specifically geared to improving regional opportunities for these target populations. We have benchmark information collected in 2016 and propose not only to target improvements in these areas, as identified in the table below, but also will revisit these benchmarks and re-establish new targets annually.

SECTOR	CURRENT SITUATION[1]	TARGET	SOLUTION
Indigenous Peoples	Known labour market gaps and underemployed workers in the region	2% increase annually	Through *AGora* supports and specific outreach programs we will grow agricultural production opportunities for Indigenous peoples in the Region, particularly in agriculture and food security
Women	Known labour market gaps and underemployed workers in the region	5% increase annually	Through *AGora* supports we will grow agricultural production opportunities for women in agriculture
Youth	Known labour market gaps and underemployed workers in the region	5% increase annually	We will expand agricultural opportunities to regional youth through a focus on improved succession planning
Small, Med and Social Enterprises	Unknown	10 new contracts awarded	We will target requests to these companies to supply goods and services to *AGora* and its participating partners

1. Sourced from "Parkland County – Labour Market Profile, December 2017". Completed by Applications Management Consulting Ltd. for Alberta Labour and partners.

4. Climate Lens Assessment (Climate Impacts)

As a result of the projects outlined, we expect a number of positive impacts on climate change adaptation and mitigation as well as Canada's climate change-related goals. In particular, we foresee positive changes that will create an indirect reduction in greenhouse gas (GHG) emissions.

We foresee a positive and direct impact on climate change adaptation goals. In particular, *AGora* could develop a micro-climate monitoring system that would reduce the impact of flood and drought on local agricultural operations. Although these impacts are not expected to be significant at the national scale, our work to date believes they are significant at the community level.

Parkland County estimated an annual total of 453,860 tonnes of GHG emissions in 2010, with transportation being the highest contributor. A slow but steady increase was anticipated based on a 1.4% average annual population growth rate. This initiative could reduce these emissions.

In recent years, Parkland County has declared agricultural states of disaster due to both drought and high precipitation events. When local wildfire events are included, proposed development of a climate monitoring system will be significant for local agricultural producers. Innovations from *AGora* will support initiatives led by all counties to reduce the risk of climate change impacts in agriculture – including the Alternative Land Use Services Programs (ALUS) and the Modeste Natural Infrastructure

Project, both of which attempt to increase ecosystem service delivery regionally through beneficial management practices on agricultural land.

5. Other Applicable Laws and Regulations and Policies

Legislative and regulatory compliance rests with the Board; the CEO, CFO and CTO will be accountable for ensuring these requirements are monitored and complied with over time. We have already established a relationship with Service Alberta to advise and assist us in this regard. Once operational, *AGora* will identify and establish similar relationships with the appropriate municipal and federal entities.