Proposal Summary

Markham's growing senior population faces significant challenges that impact their health, wellbeing and ability to live in the community on their own terms as they grow older. Services are fragmented and difficult to navigate, making it hard to find the right service at the right time. Social isolation and mobility issues also prevent full participation in the community. These factors have an impact on family members and caregivers.

We propose to alleviate these challenges through an intelligent and integrated Community Wellness Platform. Predictive, preventive services and health and wellness monitoring will be readily available, keeping seniors healthier longer and reducing caregiver burden and stress. Mobility and language barriers will be addressed. Opportunities for engagement and community participation will eliminate social isolation over time.

The Platform will enable personalized, interactive on-line experience that will significantly improve navigation and connect individuals to appropriate services when they need them. Our approach will foster an innovative ecosystem to encourage entrepreneurs to develop value-added health and wellness solutions.

This scalable Platform, the first of its kind, will empower seniors to optimize their overall quality of life. Markham has committed and capable partners and industry expertise to deliver on this proposal successfully.

Applicant information

Question 1

Please provide information on the community that is submitting this application.

Community (City of Markham)

Name of community: City of Markham
Province or Territory: Ontario
Population based on 2016 Census: 328,966
Indigenous community: No

Question 2

Please select a prize category.

$10 million (population under 500,000 residents)

Problem definition

Question 3

Please define your Challenge Statement in a single sentence that guides your preliminary proposal. It should describe the outcome (or outcomes) you hope to achieve.

Every senior in our community will be empowered to make choices, and experience proactive and responsive care that eliminates social isolation and improves their health and wellness, and that of the broader community.

Question 4

Please describe the outcome (or outcomes) your proposal seeks to achieve by elaborating on your Challenge Statement.

CONTEXT

Markham aspires to be one of Canada's healthiest cities for seniors. We envision a city where seniors experience improved health and wellness and full social inclusion. Their caregivers will have reduced stress and enjoy more reliable support systems, which will improve their own wellbeing. The result will be an enhanced quality of life for the whole community.

The aging of Canada's population is one of the most pressing imperatives of our time, as concern grows that the country is not well prepared for the impact an aging population will have on health care, social services and the economy.

Canada's population is in the midst of a demographic shift. 2016 Census Canada data indicates seniors continue to be Canada's fastest growing demographic – the number of people over 65 increased by 20% in the past 5 years, compared to 5% growth in the population as a whole. Seniors now outnumber children under 14 for the first time in history.

The Canadian Institute for Health Information reports that while seniors account for less than 17% of the population, they consume approximately 45% of public health spending. If current trends continue, the proportion of spending will grow to almost 62% of health budgets by 2035.

Markham is facing the same issues with respect to the growth in the number of seniors. The senior population in Markham is nearly 50,000 and is expected to grow by more than 60%, to 82,000 by 2026 (source: York Region) – making it the largest growing segment of the community. By comparison, Markham's youth and adult population segments are only projected to increase by 5% and 16% respectively, from 2011-2026. (Source: UrbanMetrics).

Markham's diverse population includes 77% visible minorities and 60% with a first language other than English. The number of immigrants who arrived in Markham when they were over 45 years of age is 24,000 (or 7% of the population), versus only 2% of immigrants in Canada as a whole (source: Environics).

To maintain health and a good quality of life, seniors need supports and services that will help them live as independently as possible. Transportation, and social and recreational activities tailored to seniors are also essential for them to continue to get the most out of life (CMA, A Policy Framework to Guide a National Seniors Strategy for Canada, 2015).

Recent studies confirm that the health and wellness and social experience of Markham seniors is not being optimized and action is needed (Markham Older Adult Strategy, 2017; York Region Senior Strategy, 2016). While there is much work already underway, a meaningful approach that goes beyond the silos of individual institutions, engages a broad coalition of stakeholders, and places the seniors experience at its core, is needed. Markham's smart city proposal addresses these priorities and will significantly accelerate progress through use of data and connected technologies.

There are a number of assets that differentiate, and uniquely position Markham to successfully deliver on its Smart Cities proposal:
- Innovation ecosystem – innovation centres (Markham Convergence Centre, ventureLAB, York University, Ryerson University, IBM and GM etc.), high-tech industry expertise and thought leadership (see Q10)
- "Living Lab" opportunities – seniors facilities/private residences, Markham Centre (new downtown) (see Q6)
- Community readiness – high digital literacy, reliable digital infrastructure (see Q7/10)
- Demonstrated leadership and ability to mobilize partners and execute on complex projects (see Q8)

The following sections will describe details of the community challenge, the proposed solution, expected outcomes and the associated measures.

PRIORITY COMMUNITY CHALLENGE

Following extensive public consultations, in 2017, Markham Council approved the Older Adult Strategy to address current and future needs of seniors in the community. This priority is well aligned with similar work by the Province of Ontario (Seniors Action Plan, 2016) and the Regional Municipality of York (Seniors Strategy, 2016).

The Digital Markham Strategy that was developed in 2016 envisions its goal for a "frictionless city" enabled by technology. The related public consultations identified the senior population as one of the key "personas" to inform a number of the action items included in the technology roadmap.

Consultations specific to the Smart Cities Challenge further confirmed the priority around seniors as it relates to inclusion, empowerment and access to services. Discussions with key industry experts and those who work with seniors also reinforced the importance of this priority and identified the value that data and connected technologies can bring.

The various consultations and research undertaken have identified a number of key gaps in the current seniors' experience that impact their health & wellness:

- *Fragmented, disconnected services* - the transition between services is not optimized; citizens don't know where to go for what service and often are left on their own to find the right programs with the right service provider. There is no tailoring of service offerings to address personalized needs.

- *Lack of access to information* - Markham seniors do not have coordinated and simplified access to necessary information about services, programs and activities.

- *Mobility challenges* - it is difficult, if not impossible at times, to access the right services at the right time in the right places across the City of Markham; timely and personalized transportation services are not available.

- *Social isolation* – Markham seniors feel isolated due to language barriers, lack of awareness of community programs and services, and inability to participate.

- *Lack of services and programs* - current services may not be sufficient and do not address the needs Markham's diverse community.

At a broader system level, as the population ages, the cost of caring for seniors increases. As an example, the cost of caring for seniors in the Markham Stouffville Hospital (MSH) Emergency Department (ED) represents 33% of ED costs, although seniors only represent 20% of visits. Once admitted to the hospital, the cost of caring for seniors is 51% of total costs but represent 32% of our patients. Seniors with low acuity symptoms that could be resolved in the community, represent 23.3% of ED visits by seniors. These patients risk being designated as Alternate Level of Care (ALC). ALC patients represent 15.6% of the inpatient days at MSH. They receive costlier care than in community settings using beds that could better serve acute patients, and being exposed to more serious illness.

The benefits of allowing seniors to age in place with the appropriate support are well substantiated in the literature.

In addition, there will be a positive collateral impact on the lives of the citizens that currently concern themselves with the care of their elderly partners, relatives and other seniors including the "sandwich generation".

The current health and community services systems are also characterized by one or more of the following attributes: institutional silos, manual and paper based processes, isolated systems/data, limited access to data, lack of data analytics, disconnected services, etc. These issues lend themselves to be addressed through data and connected technologies.

Considerable efforts have already been made by health institutions, other service providers and community groups to improve navigation and care transitions for seniors. However, a fully integrated smart city approach to prevention, early intervention and wellbeing within the community has not been implemented to date in any jurisdiction in Ontario, and perhaps Canada. This proposal could prove to be a key enabler to the sustainability

of our health care and community services systems for seniors, and other segments of the population, in the future.

OUR PROPOSAL

The Markham smart city proposal is to develop an intelligent and integrated COMMUNITY WELLNESS PLATFORM, an innovative technology solution with a series of discrete and scalable components including resource navigation, in-home "check-ups" and personalized programming that will connect physical and virtual services and enhance the overall experience of seniors, their caregivers and other providers. This proposal will address key challenges having an impact on the wellness, inclusion and health of our seniors:

Fragmented, Disconnected Services
Through this Platform, we will foster collaboration across services, offer more cost effective personalized service delivery, and implement predictive technology capability to monitor wellness indicators to allow early intervention. Our solution will ensure a better integrated delivery model and clarity the various roles of community support/wellness services, resulting in enhanced access for seniors in Markham.

We will connect seniors and caregivers to the "right" programs and services at the "right" times while being sensitive to cultural and linguistic needs. Our solution will aid in the increased awareness of skills, knowledge and life experiences of seniors, so that they can make meaningful ongoing contributions to the local community. The Community Wellness Platform will make it easier to identify, find, and participate in support and wellness services for seniors in Markham.

Lack of Access to Information
Information from a large number of existing services and programming, as well as new solutions and programs, will be managed in a centralized and interactive 'database' through an integrated and community-wide collaborative information governance model.

Self-service options (with easy-to-use and multilingual interfaces and navigation) will guide Markham seniors through the many health and wellness opportunities in the City. Communication of social, leisure, educational, and recreational programming will be concise, clear and accessible on a variety of integrated technology platforms, including the web, mobile, local TV, and kiosks, public spaces and community centres.

Mobility Challenges
To ensure inclusion, participation, and comprehensive access to physical and virtual programming and services, and integrated on-demand mobility solutions will be part of the Community Wellness Platform, providing convenient transportation to keep the seniors connected with the community.

Social Isolation
The Community Wellness Platform will give seniors the tools and access to support and services to grow older in their own community and at home. Access to programming and participation in locally hosted social events and activities, and the intelligent use of social media and other collaboration platforms and communication tools will give seniors the ability stay connected and engaged. This would include use of augmented and virtual reality technologies.

The Platform will facilitate face-to-face interaction and personal connection. It will serve to raise awareness of seniors' needs and engage community members to interact with seniors and watch out for their wellbeing.

Lack of Services and Programs
To address this community challenge, we seek to deliver innovative technology solutions that are tested in living labs, allowing for predictive and proactive identification of requirements and offering preventive applications of services. Needs for additional services will be identified and will be made available on the platform.

OUTCOMES AND MEASURES

Markham's proposal is designed to deliver, secure, and enable community wellbeing at the intersection of HEALTH & WELLNESS, ACCESS and SOCIAL INCLUSION. These three areas are enabled through a Community Wellness Platform that will be developed and sustained through open innovation.

Our submission sets out to achieve four higher order outcomes listed below. In order to measure the success of our smart city solution, we will use components of evidence-based wellness indices focused on social inclusion and healthy aging (eg. Canadian Well-Being Index, Perceived Quality of Life Scale, and others to be identified).

1. HEALTH & WELLNESS outcomes include:
   • keeping seniors healthier
   • enabling them to "age in place" for as long as possible,
   • deliver predictive and preventative services, and
   • reduced caregiver stress and burden.

Below are the measures identified for the above outcomes:
   • Decrease in non-emergency calls to 911 by seniors
   • Decrease in Emergency Department visits by seniors with low acuity symptoms
   • Reduced Alternative Level of Care rate
   • Reduced Average Length of Stay in hospital in Alternate Level of Care
   • Improved wellbeing using selected wellness index
   • Increased percentage of seniors reporting they are satisfied with their overall care
   • Increased percentage of seniors that rate their health (and/or wellbeing) as good, very good or excellent
   • Increased number of successful preventative early health alerts, and
   • Reduced levels of stress reported among caregivers and family members of seniors

2. ACCESS related outcomes include:
   • improved service navigation and connecting seniors and caregivers to the right programs and services at the right time,
   • provision of personalized, on-demand mobility and transportation services, and
   • enhanced digital literacy and reduced language barriers.

The measurements that help to determine our progress towards these outcomes are:
   • Increased number of multi-channel opportunities for seniors to learn about, and access programming and services
   • Increased number of independent seniors that are able to age in place
   • Seniors and caregivers report improved navigation and access to available programs, services and supports
      • Increased number of caregivers reporting that they have the tools they need to provide effective care.
   • Increased awareness among community members of the health/wellness needs of seniors, and
   • Increased awareness among community members of proactive wellness practices that facilitate healthy aging

3. SOCIAL INCLUSION related outcomes include:
   • availability of both virtual and physical opportunities for meaningful participation in services, programs, and community activities, and
   • elimination of social isolation, reducing loneliness.

These outcomes will be measured based on the following factors:
   • Increased participation by seniors in community programming utilizing diverse means of access and mobility (wellness, recreation, library, social and leisure programming)
   • Increased level of satisfaction with social engagement opportunities for seniors
   • Increased seniors' satisfaction to make own choices for health and wellness services
   • Increased number of volunteer seniors working directly within the community

- Reduced number of seniors and caregivers reporting feelings of isolation
- Increased percentage of community members of all ages reporting regular engagement with seniors

4. COMMUNITY WELLNESS PLATFORM – primary outcome includes:
- Strengthened innovation ecosystem enabled by a culture of collaboration, invention and open innovation
- Opportunity for students, incubators and startup entrepreneurs
- Development of value-added solutions on the Platform

These outcomes will be assessed based on the following measures (specific goals will be established in the initial project phase):
- Number of users of the centralized Community Wellness Platform (membership)
- Number of users accessing the Platform through a language other than English
- Level of engagement by community partners (Percentage of community partners – including health and wellness service providers – included on the Platform.)
- Number and effectiveness of solutions (as to be delivered on the Platform) by established businesses, start-ups and entrepreneurs in the pipeline, in development, or launched.
- Number of students engaged in the development of solutions, building the Platform, and volunteering for programming and services digitization.

In the next six to nine months we will work with our academic, community, and industry partners to identify a lead research partner. The project stakeholders will work with our research partner to develop a robust evaluation framework including a strategy for finalizing baselines and measuring progress towards outcomes throughout the project lifecycle. This will also be an opportunity to validate the suggested outcome measures and make the necessary adjustments.

In addition, we anticipate powerful stories about the impacts of our initiatives on seniors, their care-givers and our community. These cannot be captured by quantitative measures and indices alone. Thus we will also utilize well recognized qualitative evaluation measures to capture the impacts of our work and supplement the quantitative data.

Question 5

Please describe how your community residents have shaped your Challenge Statement. Describe your plans for continuing to engage and involve them in your final proposal going forward.

The vision for Markham's Smart Cities submission was extensively inspired by community feedback over the past several years, as well as response to the recent Smart Cities engagement. Through a series of consultations, surveys, online submissions and focus groups, our citizens have shared their vision for an inclusive and connected city.

PREVIOUS ENGAGEMENT ACTIVITIES
Feedback from the community was collected from a series of engagement opportunities related to the Digital Markham Strategy (2014-16), Older Adult Strategy (2016), Building Markham's Future Together Strategic Plan (2015), MSH-Venture Lab Collision Day (2016), Diversity Action Plan (2008-10) and the current Smart Cities Challenge (Feb. 14th-March 4th), including:
- 10+ community conversations and focus groups
- 12+ stakeholder engagement meetings
- 3,500+ surveys from residents and stakeholders
- 750+ combined participants in workshops and consultations
- 125+ online submissions and responses

FEEDBACK FROM THE COMMUNITY
The community identified a number of issues in the course of these engagements:

SMART CITIES CONSULTATIONS
1. Social isolation disproportionately impacts older adults. Lack of accessibility (especially transit) results in social isolation of seniors who cannot easily navigate the city. This isolation has severe negative health impacts and exacerbates the ill-effects of aging.

2. Although recognized for its diversity, Markham lacks cultural integration, leading to social isolation. This is seen in part as due to linguistic barriers which may inhibit participation in social and community events outside of one's own cultural community.

3. The community (especially older adults) are challenged in their ability to access services for several reasons:
    a. Language and cultural barriers face newcomer seniors trying to navigate health and social services.
    b. No coordination amongst service providers, overwhelming seniors trying to navigate multiple points of access.
    c. Limited health information literacy impedes independent care management for seniors.
    d. Seniors with limited mobility cannot access community resources resulting in both poorer health outcomes and deeper isolation.

4. Seniors aging at home experience loneliness and lack of social networks, impairing health outcomes; long-term care options for seniors are lacking. Isolation also affects spouses and caregivers, contributing to burn-out

5. Isolation renders economically and socially vulnerable populations more vulnerable, including older adults. As the city continues to grow and urbanize, this will worsen.

6. Participants wished to see an integrated, connected community sharing a common experience of their city, describing a vision of the city where cultural, mobility, accessibility and age barriers to participation in community life would be eliminated. The community shares a vision that Markham's Smart Cities strategy will improve inclusion and empowerment for the community.

DIVERSITY ACTION PLAN: EVERYONE WELCOME
Markham's Diversity Action Plan based on extensive community consultation. Feedback about seniors reinforced the importance of inclusive access to programs and other opportunities to reduce social isolation:
1. Language inclusion will encourage seniors, including newcomer seniors to attend community programs and events.
2. Transportation can be a barrier to participation.
3. Seniors are underutilized as volunteers – creating inclusive opportunities for seniors to volunteer can both reduce cultural isolation and enhance health outcomes by providing social interaction and a sense of purpose.

COLLISION DAY
In November 2016, Markham Stouffville Hospital partnered with ventureLAB and several community health service providers to bring together patients, experts in seniors care, and local entrepreneurs to brainstorm innovations, technologies, infrastructure, partnerships and processes needed to create a more robust, connected network in the community for frail seniors. With over 75 attendees, four themes emerged;
1. The need to empower and inform patients
2. Making the community health system easy to access
3. Sharing accountability for patient outcomes
4. The need to support caregivers

OLDER ADULT STRATEGY (OAS)
Consultations with the community identified three priorities directly related to the themes of healthy aging,

inclusion and technology:
1. Community support services that include health and personal care services, in-home assistance, peer-to-peer networks and other services to allow seniors to maintain their independence and dignity.
2. Opportunities for social participation through leisure, recreation, education and cultural activities to help seniors develop supportive relationships and community connects that reduce isolation and loneliness and foster respect and inclusion.
3. Opportunities to enhance communication and information access to allow seniors to stay connected and access information about their community.

Top improvements identified in the OAS consultations focused on communications, barriers to participation and preparing for aging.

DIGITAL MARKHAM STRATEGY
Consultations during strategy development identified the potential for improvement and expansion of service delivery through investment in digital infrastructure. Participants identified the following initiatives as opportunities to enhance civic participation, community engagement and to reduce social isolation:
1. Citizen engagement, community connection and quality of life enhancement through technologies that improve connectivity (public wifi enhancements, smart community centres).
2. Investments in digital literacy through the public library to support equitable access to information.
3. Increased integrated digital services on the web & mobile platforms to enhance service to community members.
4. Engagement of citizens through digital community engagement platforms.
5. Reduction of barriers to civic engagement through digital democracy initiatives.
6. Enhanced personalization of citizen service using predictive Artificial Intelligence (AI) technology.

LINKS TO SUBMISSION THEME
Through these engagements, Markham residents expressed their vision for a Smart Markham. In their own words:

1. "Technology could build bridges between people and cultures"
2. "[We would have the] ability to connect community hubs"
3. "[Markham would have] accessible community information through technology"
4. "[There would be a] breakdown of cultural barriers and… increase [in] social trust".
5. "I have the option and the time to connect with my community and live a healthier life"
6. "Seniors should be able to stay in their homes as long as possible"

Throughout these various engagements, three interconnected themes emerged:
1. *Connectivity* - both in terms of communications technology and inclusive social connections - and its power to reduce isolation in the community.
2. *Empowerment* – the community seeks to be empowered to live better through access to information, barrier-free mobility and social integration.
3. *Integration* – the community desires seamless access to community resources, services and social opportunities.

This feedback directly links to our focus on health, wellness and inclusion: an inclusive community is one where citizens are healthy, socially connected and empowered.

While the entire community benefits from inclusion, this is particularly so for vulnerable populations, including seniors. Older Adults are a priority community for Markham:
1. Seniors are at greater risk for social isolation due to language, mobility and health barriers.
2. Social isolation is proven to have a myriad of negative health impacts in seniors.
3. The senior population in Markham is the fastest growing age demographic.

Linking these themes, Markham's Smart Cities Challenge submission is focused on using smart solutions to support healthy, independent aging by empowering seniors and their caregivers to make meaningful,

sustainable care decisions through knowledge mobilization, digital access and social integration.

INCLUSIVE ENGAGEMENT
Consultations were advertised through social media (including WeChat), the city portal, newspaper ads, mobile signs and seniors' organizations. In addition to a general call for participation, invitations were extended to community partners and stakeholders representing a wide range of interests. Staff promoted inclusion through their community partners including organizations that work with diverse communities such as newcomers, seniors and different cultural and faith groups in the city. In some cases, translation services were provided when required.

In-person sessions took place at city-operated Seniors Centres and a number of community centres and libraries. These sites are dispersed throughout the city and provide open access to all. Online engagement tools were utilized to ensure opportunities for individuals with transportation and mobility barriers that precluded physical participation.

PLANS FOR ONGOING ENGAGEMENT
Markham plans to continue to work with stakeholder groups once shortlisted for the competition. The engagement plan will include:
1. Ongoing Consultations (summer 2018 – winter 2018/19) - held at key project milestones, through stakeholder engagement meetings and surveys.
2. Outreach to community settlement organizations, cultural centres and houses of worship to engage non-English speakers (summer 2018).
3. Direct engagement with seniors through Seniors Clubs, the Seniors Advisory Committee etc. (summer 2018)
4. Qualitative research and data collection (summer 2018 – winter 2018/19) – interviews, focus groups and surveying of older adults and caregivers to establish baselines of outcome measurement to determine impact of project interventions.
5. Test Community (summer 2018 – winter 2018/19) - assemble network of participants to provide ongoing feedback, test solutions, etc.
6. Host a series of physical and virtual community 'kitchen table' conversations to probe deeper into issues including social isolation (summer/fall 2018).
7. Participatory Design Conference (fall 2018) – bring together community members and stakeholders to co-design elements of the smart solution. This ensures the participation of people we seek to impact.
8. Markham will also leverage opportunities through various local sessions and forums; e.g., the upcoming caregivers' conference taking place in Markham in June 2018.
9. Youth Engagement Opportunities will indirectly engage parents as their children explore concepts related to the smart city framework through workshops and activities.

In the meantime, the City will engage its partners in the innovation ecosystem to work towards formalizing relationships and on exploring governance models, partner onboarding process etc. that will be critical if Markham is selected.

Preliminary proposal details

Question 6

Please describe your preliminary proposal and its activities or projects.

OUR APPROACH

Planned activities and projects were developed with a collaborative group of academic, community and industry stakeholders who reviewed the common themes and ideas and prioritized those with the greatest impact on outcomes. Each activity follows an approach to solution design-thinking centered on three elements; (a) leveraging existing programs, services and activities (b) creating living labs to test solutions, and (c) using innovation procurement methods.

(a) Leveraging existing programs, services and activities
In a system already facing financial challenges, merely adding resources is not a sustainable solution. Programs and resources are in place to support healthy aging at home, however there are significant gaps in coordination and integration. Our proposal does not seek to replicate existing services, but focusses on optimizing services and enabling collaboration to better link and integrate the services for users.

(b) Creating living labs to test solutions
Solutions will be part of a 'living lab' approach to innovation. The City of Markham has a strong innovation ecosystem with a large number of committed partners from the healthcare and social services sector; tech-industry, the academic sector and the small/medium business community, start-ups and incubators.

The partners in the healthcare and services sector, offer resources and access to the relevant stakeholder groups for solution definition, design, piloting and testing. Solutions that have larger urban implications (e.g. mobility) will be deployed first in the new Markham Centre which is well-suited for its amenities and services infrastructure.

Markham Centre will be a primary testbed and showcase for many of Markham's future innovations, interconnected through ultra-high speed broadband (among Canada's fastest networks) with this proposal's healthcare and community services partners.

The planned activities, will include co-designing (applying "design-thinking" and continuous process improvement as the method of ideation and optimization), implementing, and testing various solutions with diverse groups of seniors (including caregivers) in all living situations: their own homes, supported independent living, and seniors' facilities. As we collect data and observations, we will take an iterative approach to solution improvements and rapid deployment of solutions to our users.

Digital Infrastructure - The underlying infrastructure required for any municipal innovation is a secure, resilient, and modern "digital infrastructure". With its technology partners and telecom carriers, Markham will ensure availability of this infrastructure as the foundation for our Smart Cities challenge solution.

Involvement of our vibrant startup community and incubators is essential to provide for the healthy and constant flow of innovations. ventureLAB, one of the Province's leading innovation centres for health technology innovation and commercialization, will be a catalyst for engaging the entrepreneurs in Markham and the Region.

(c) Innovation Procurement Methods.
Finally, solution partners will be selected using an Innovation Procurement methodology. This is a form of value-based procurement that allows public sector organizations to conduct procurements in a way that encourages innovation while maximizing value-articulating outcomes versus stipulating deliverables.

Defining the desired outcomes in an open and competitive process gives us the opportunity to partner with technology vendors and co-design solutions that may not even exist yet or may require significant adaptation. The Innovation Procurement approach will ensure that when pilots prove successful we can move directly to purchase and implementation. We will explore giving other municipalities and organizations the opportunity to observe the process and purchase successful solutions as well.

We will expand on our current innovation procurement experiences, but leverage learnings from other Canadian communities (e.g. Toronto, St. Albert, Vancouver) as well as global examples.

OUR PROPOSAL

Our solution will have five primary projects and activities to achieve our desired outcomes: (1) Community Wellness Platform, (2) Resource Navigation System, (3) Seniors Home "Check-up" System, (4) Virtual Wellness and Social Activity Programming, and (5) Solution Incubator and Accelerator.

1. Community Wellness Platform

The foundation of our proposal is an integrated and predictive digital platform that will be used to collect and share data, connect users with services, support all the use cases that address our challenge statement and enable our outcomes. Unlike traditional patient health records, this Platform and the wellness data it contains, is owned by the patient/resident, and they control who can access their data and when. The City of Markham would facilitate the development of this Platform, through its key technology and community partners, creating a "trusted" environment for collaboration and navigation that respects personal information and privacy requirements.

Built in a way that is scalable and secure, this Platform will connect all the different community organizations that support patients aging at home, including city programming, health care organizations, care providers, community agencies, and mobility services. As an integration engine, the Platform will use technologies such as blockchain to manage the data transactions, and artificial intelligence to provide predictive data reporting.

Using open Application Interfaces and middleware integration tools, solution providers can write software and develop applications that will seamlessly integrate with the Community Wellness Platform. Consequently, new functionality can easily be introduced and tested on the Platform.

The Platform will allow users to fully manage their own "wellness file" including the ability to personalize their individual needs and wishes, schedule appointments, and seek trusted wellness-related information. The Platform will leverage existing transportation service providers to facilitate personalized, proactive and reliable on–demand mobility services to ensure seniors can access programs and services. Personalized wellness management will provide seniors with more consistency in their caregivers and support services. Special accommodations for ability will be uniformly provided. Training (in-home, online, workshops) will be provided to ease adoption anxiety and facilitate effective use.
As a foundational element, development of the Platform will impact every outcome measure as it will host all other solutions, including the living lab test technology applications and services.

We will design the Platform such that it has the ability to scale and accommodate new innovative use cases as our Smart City program evolves.

The Community Wellness Platform, along with connected digital infrastructure (ultra-high-speed, secure, resilient network), are the catalyst for the health and wellness transformation of all Markham residents. The Platform will be scalable, expandable, applicable, and transferable to all Canadian communities.

2. Resource Navigation System

Navigating the different health and wellness resources can be difficult for seniors, especially in a community as diverse as Markham. As part of the Community Wellness Platform, a health and wellness resource navigation tool will be built to help connect seniors to the information they need to age well at home. The system will use artificial intelligence along with the user's personal profile information to facilitate appropriate, personalized responses to information requests and links to services most suited to their needs.

The tool will incorporate extensive information on the available community health services and how to access them. The Platform will securely provide personalized information, including how and when to take medications, caregiver schedules, appointment locations, pharmacy orders, food delivery programs, etc. Serving as a central hub, this tool will be culturally appropriate and translated to multiple languages with additional accommodations for sight and hearing impairments to ensure equal and easy access to content.

Implementing a tool for health and wellbeing resource navigation will improve satisfaction with health and wellness services available to support aging at home, and will increase participation with health and wellness community programming.

3. Seniors Home "Check-up" System

Identifying seniors at risk and monitoring their wellbeing is key to allowing seniors to "age in place" and avoid them tipping into the acute care system. Leveraging the Wellness Platform and the "Internet of Things", the home check-up system will utilize sensors in the home and integrate data from activity-tracking wearables to centrally monitor the health and wellness of seniors. This would provide a proactive means for friends and family of the seniors, caregivers and community networks to receive early alerts and intervene if their health is deteriorating or they experience problems. The system will trigger alarms and recommend actions to ensure quality and timely response and attention to the wellbeing of the senior.

The "check-up" would be enhanced by implementation of online access to a suite of health services, allowing the senior to engage medical practitioners without leaving their own homes. This would build on available telemedicine technology.

The home check-up system will monitor engagement with the community and provide a means for engagement if isolation is occurring. The system will create virtual senior centres where people can video chat, socialize in groups, play games, swap music, tell stories, and show each other pictures, negating isolation and improving health. Advanced video and voice capabilities are part of the home check-up system to enable this two-way communication.

This activity will have significant impact on our outcomes. With a direct link to reducing social isolation, this home check-up system will result in fewer emergency department visits, reduce healthcare costs, and improve wellbeing. This solution can also be extended to persons with disabilities and other users. The return on investment on this home check-up system will be immediate.

4. Virtual Wellness and Social Activity Programming

Once the Platform is in place and actively used by seniors and caregivers, the opportunity will be available to analyze collected data to identify gaps in services and knowledge. Requirements will be filled by developing virtual wellness programming, delivered in the home through the Platform. This programming will connect and integrate all the organizations that support health and wellness in the community with seniors. Programming will be personalized and relevant to aging at home and may include reducing falls risks, heart health, or at-home exercising.

The real-time feedback from this solution on the utilization of existing programs as well as identification of new programs will enable the municipality and health organizations to measure the efficacy of services delivered.

This part of the Platform will allow for continuous improvement of current and future offerings while immediately measuring and improving the impact on the senior community. Augmented Reality, Artificial Intelligence and data analytics technologies will be utilized to enable these benefits.

This activity will primarily impact outcomes related to access, ultimately improving the independence of seniors but also improving health outcomes like reducing emergency department visits. A positive side effect is the augmentation, relief, and support of the personal care provided by family and service providers.

The Platform also provides seniors with access to community services and social activity programming and will enable gaps in these areas to be addressed. Social activities could be virtual or physical in nature, depending on the choice and availability of options. Examples include partnerships with community organizations, connection with visiting volunteers, school groups (on-line or visits), special event invitations, physical activity feeds and entertainment links. Language barriers will be removed through translation capabilities. Seniors, their caregivers as well as community event organizers will contribute to shape and enrich their overall experience.

5. Solution Incubator and Accelerator

Markham will establish an innovation ecosystem and culture that will nurture and support the development of visionary solutions. The ongoing engagement and consultation as described under Q5 will continue to offer ideas and recommendations as to new features and functionalities of the Community Wellness Platform. The constant collaboration with members of the community, seniors, industry thought leaders, and innovators is essential to the continued success and relevance of the Platform. A design-thinking methodology and prioritization will be applied to identify, design, and pilot new possibilities. The open innovation approach will enable solution incubators to participate and provide solutions on the interoperable platform that integrates with existing and future infrastructure.

Markham will be "the place" to test and validate solutions and offerings that will have a demonstrable impact on the wellbeing and health of our aging population. Smart City initiatives implemented as part of this project and the Digital Markham Strategy, and lessons learned will be expanded throughout Markham and future development areas. Innovators and cities from across the country will have access to the open APIs and be able to help grow and develop the Platform.

In addition to the listed high level projects, the City will play a key role to engage industry and academic partners and stakeholders to properly address areas related to governance, data security and privacy, program operation and sustainability.

Question 7

Please describe the ways in which your preliminary proposal supports your community's medium and long-term goals, strategies, and plans.

As Canada's most diverse city, Markham has long understood the need to look out for those community members that may encounter barriers because of their age, cultural background, level of ability or other unique characteristics.

With its concentration of high tech companies and an environment and culture of innovation, the City is known as the "High Tech Capital" of Canada. The City has a demonstrated track record of willingness to explore bold and forward-thinking solutions that make use of data and connected technology.

These priorities align with the Smart Cities Challenge and are embedded in Markham's goals and strategies.

The City's Strategic Plan, **Building Markham's Future Together: 2015-2019**, focuses on four goals:

1. Exceptional Services by Exceptional People
2. Engaged, Diverse & Thriving City
3. Safe & Sustainable Community
4. Stewardship of Money and Resources

The first goal includes a priority on transforming services through technology and innovation, including the Digital Markham Strategy development.

The **Digital Markham Strategy** was developed after extensive consultation with the community and thought leaders in the industry. The strategy envisions a "frictionless" City of Markham in 2025 and was approved by Council in January 2017.

The strategy provides a 3-5 year digital roadmap and has four main objectives: Engaging and Serving the Community, Being the Digital Differentiator for Business, The Digital Workplace, and The City as a Platform for Innovation. The latter focuses on enabling digital innovation by partnering with providers, academia and the rich cluster of tech companies in Markham to solve community problems - which strongly aligns with the Smart Cities Challenge program.

Under this program, Markham Centre is the focus of many possible digital opportunities as a "living lab". Advanced discussions are already underway on how to build/shape a digitally connected community that will have a unique experience, including the condo owners/residents, GO train riders, visitors or students in the new York University campus that will open in 2021.

Building Markham's Future Together promotes inclusion and engagement for all: "Engaged, Diverse and Thriving City - We will have an inclusive City where every person has a role in building a livable, caring and interconnected community". A number of key plans within the City support this goal, and strongly align with the focus of the Smart City proposal.

The **Markham Diversity Action Plan, "Everyone Welcome",** approved by City Council in 2010, supports an inclusive community that works for everyone and focuses on seniors as well as youth, newcomers and visible minorities, and persons with disabilities.

The **Markham Older Adult Strategy** was approved by Council in 2017 and supports initiatives to make Markham a "Leading Age-Friendly Community in Canada, responsive to older adult citizens and promoting independence, respect, innovation, diversity and community engagement". It focuses on Community Support Services, Social Participation, and Communication & Information and also supports the **York Region Seniors Strategy**.

This submission aligns with existing City priorities around seniors but represents an opportunity to accelerate these efforts and achieve outcomes at a whole new level using advanced technologies.

BMFT-Strategic-Plan-Document.pdf (784.43kb)
MARKHAM+OLDER+ADULT+STRATEGY+Final+Report.pdf (3.89mb)
Markham-Digital-Strategy-Summary-Report-2016.pdf (1.29mb)
Markham-Diversity-Action-Plan.pdf (3.86mb)
YR+Seniors+Strategy.pdf (4.95mb)

Question 8

Please describe your community's readiness and ability to implement your proposal successfully.

Markham is well positioned to successfully implement the Smart Cities proposal. The City is executing its Digital Strategy supported by a multi-sector "Digital Alliance" of key thought-leaders who have helped scope the Smart City proposal.

The City has well-established relationships with all of the key stakeholders who will be involved in the Smart Cities project, and has the ability to quickly establish the proper governance structure and project capacity.

Markham is a leader in City building and has a demonstrated track record of delivering large scale complex projects involving multiple stakeholders, on time on budget, including the following leading edge initiatives.

York University Satellite Campus Bid:

When York University announced it was looking to locate a satellite campus in York Region in 2014, Markham mobilized a multi-disciplinary team including business leaders, local associations, developers and other stakeholders to develop its bid.

Markham's submission proposed a unique, innovative approach for the university in Markham Centre leveraging existing City infrastructure including the Pan Am Centre, City community centres and libraries, sports fields, as well as high tech business support and resources. The result was a more strategic and cost effective approach to establishing the new campus, while offering a vibrant student experience.

Markham was selected as the location for the new campus in June 2014; the campus will open in 2021.

A sub-committee of Council, The York University Markham Campus Committee oversees this initiative. The York curriculum includes a focus on health sciences and technology, supporting implementation of the City's proposal, through research, and the creation of a technology talent pipeline.

Pan Am Games:

In 2015, Markham was a key partner in the Pan Am /Parapan Am Games, with four host sport venues. The City was responsible for the successful planning and delivery of infrastructure, programs, outreach and services.

The project involved partnerships among 18 different governments (federal/provincial/16 municipalities). A steering committee was established including members of Council and community representatives, along with Sub-Committees.

Over 40 partnerships were created with local businesses, community organizations, community leaders, school/youth leaders to engage the community. Outcomes included:
   • a new state of the art sport centre
   • City-wide volunteer program
   • public art program
   • $700,000 in donations for activations, including a nine-day festival

Canada 150:

Markham implemented a year-long program including legacy infrastructure projects, events and local community engagement to celebrate Canada 150. The City received $1.9M in federal and provincial grants, and established two committees to successfully steer the initiative.

Outcomes included:
- significant community engagement
- construction of five infrastructure projects across the City
- signature events including Canada Day celebrations, a three-day Markham "Expo", and numerous community and neighbourhood celebrations.

Wellness Campus:

Markham planned its new Cornell Community Centre to allow a physical connection to the Markham Stouffville Hospital (MSH), creating a common wellness campus, the first of its kind in Canada. The City and MSH have developed an award winning partnership program called "Breathe Better", which offers free exercise classes at the Cornell Community Centre and Library for patients with COPD. The program has been successful in improving overall fitness level, promoting engagement and reducing the effects of COPD.

Energy Sector Leadership:

Markham has played a leadership role in the electricity sector through the creation of PowerStream Inc, in 2004, a merger involving three utilities. Further mergers/acquisitions culminated in the creation of Alectra in 2017. Alectra is the second largest local electrical distribution company in North America.

Transactions such as these are very complex with many variables, risks and opportunities and Markham provided significant due diligence and analysis, to ensure shareholder value and benefit to customers. This further confirms Markham's ability to effectively support sophisticated, higher risk business ventures.

In 2000, Markham established Markham District Energy (MDE), now the fastest growing utility in Canada. Through the City's leadership, nearly 6 million square feet of building space in Markham Centre has been connected to MDE, reducing the City's carbon footprint and increasing customer comfort. Cornell Community Centre and Markham Stouffville Hospital are now served by MDE.

Markham's strategic energy sector investments have provided a reliable dividend stream to support the operating budget and fund the life cycle reserve, while providing good service to customers.

Other Considerations:

The City employs a rigorous project management methodology for all projects; this ensures full endorsement and engagement of Council, and other partners, the establishment of necessary governance, and oversight by senior leadership and necessary resources to deliver. The City has numerous examples of successful implementations of technology including IoT enabled smart systems in the areas of street lighting, garbage bins, building automation, and most recently textile recycling.

With respect to organizational limitations, the City is a lean organization, but would appoint a project director and mobilize a dedicated team of internal and external resources for the project. A governance model including Council, the community and business leaders would be established to steer the project.

The Challenge requires nimble and flexible procurement to allow timely acquisition and testing of new technologies. This may not align with more traditional procurement methods. The City is prepared to pursue Innovation Procurement approaches and to consider change to its current bylaw to facilitate this.

Although the City has some experience in implementing smart technologies, we will rely on our ICT partners and academia expertise to obtain the necessary skill sets for the project. This includes the Regional Innovation Centre, ventureLAB, with extensive success in building and delivering public-private partnership programs including the FedDev Ontario Project for Health Innovation and Commercialization, and the $950 million Federal Supercluster Initiative.

In addition to its proven track record of successfully implementing complex projects, Markham has an active ecosystem (with over 1100 technology and life science companies) of relevant committed stakeholders (see Q10). The City enjoys among the highest digital literacy in the country (Environics), and its libraries are among the leaders in technology use. Our ability to mobilize the community with a platform and smart city solutions will be higher than almost any other community in Canada.

Question 9

Describe your plan for using the $250,000 grant, should you be selected as a finalist. Provide a high-level breakdown of spending categories and an accompanying rationale.

If selected as a finalist, the City of Markham and our partners will continue to perform an in-depth analysis into the journey of our target population using Design Thinking and Health Human Factors techniques such as interviewing for empathy, storyboarding, and prototyping. Led by a dedicated project manager, the insights gained from this targeted consultative process will provide our final proposal with detailed baseline metrics, achievable targets, an evaluation framework, and identified solutions with committed partners and implementation plans.

As an innovation procurement approach is also being used to support our outcomes, early market engagement activities, such as reverse trade shows, market sounding, and market creation will be used to gain further interest in this project within the vendor community and help select partners that will be included in the full proposal.

Below is a high level breakdown of proposal costs. At least one proof of concept will be initiated (rapid prototyping) for at least three of the identified activities to help determine final project planning and feasibility. Communications and outreach will also be a large component of the proposal writing stage, as seniors will be directly involved in all co-design and proof of concept activities.

High Level Cost Breakdown (6 - 9 month period)

1. Proof of Concept Prototyping: $75,000
   Leveraging students from participating academic organizations to join in hackathons and rapid prototype exercises to develop mockup solutions that can be used to aid in the consultation sessions; soliciting feedback from seniors and community stakeholders.

2. Project Management: $80,000
   Dedicated project manager and support staff to manage and oversee the proof-of-concept prototyping and the consultation sessions.

3. Design Thinking Consultation, Research and Final Submission Preparation: $70,000
   Expert support to facilitate several consultation sessions with stakeholders to further develop the hypothesis, review and feedback on the prototypes, and provide more granular input on the final submission. This also includes resources for research to establish evaluation framework and metrics for the identified outcomes.

4. Communications: $10,000
   Community engagement through various virtual platforms, and our public libraries and community centres, among others.

5. Explore options for governance security/privacy, Platform operation and partner onboarding: $15,000
   Research and assessment of options will be undertaken for governance models for the Platform operation, data, security, and partner on-boarding.

The City will leverage the experience gained by its key partners such as ventureLAB in managing public-private partners required and to coordinate some of these collaborative activities.

Question 10

Describe the partners that are or will be involved in your proposal. Where partners are not yet determined, describe the process for selecting them.

This smart city project will bring together diverse stakeholders to deliver a scalable and sustainable platform to meet project goals. The stakeholder partners will contribute towards:

1. Access to target populations (for design, testing, validation)
2. Technology and innovation (for design/development)
3. Health, social and community services (for business process integration/digitization)
4. Research and marketing (for innovation and awareness)
5. Community engagement (for engagement, support, awareness)

Partners are identified by leveraging relationships through Markham's Digital Alliance group (a multi-sector advisory group of key industry thought-leaders).

The four key partner categories of Markham's proposal include:

Healthcare Services
Healthcare and Health Service providers will provide access to the sample population of seniors in the City. The partners make available comprehensive health technologies and services that can be digitized as part of the Platform. The partners will participate in proof-of-concept, testing, and eventual commercialization of the Platform and its solutions.

Partners:
• Central Local Health Integration Network
• Saint Elizabeth Health Care
• Markham Stouffville Hospital
• Unionville Home Society

Social and Community Services
Strong community engagement and collaboration is essential for successful development and implementation of the Platform and its applications. The partners will create the necessary policy environment and collaboration framework for project success, and ensure community engagement.

Partners:
• Markham Public Library, Community Centres
• Regional Municipality of York
• Cultural associations, social services agencies
• Markham Seniors Advisory Group, Seniors Clubs

Technology and Innovation
We will fully engage Markham's innovative technology sector. Many of Canada's largest technology companies are part of our proposal.

These partners provide digital capabilities and skilled labour essential to building and implementing the

Wellness Platform and the initial healthcare solutions. They will provide in-kind (technology) and expertise support, as well as access to their respective innovation ecosystems. ventureLAB will play a critical role in enabling start-ups and entrepreneurs to create innovative solutions to be tested and rolled-out through the Platform (Markham as a "living lab").

Partners identified so far:
- IBM
- General Motors
- Cisco
- ventureLAB
- YSpace (York University Innovation Hub)

Education
Education partners are integral to project research and development. Academic staff and students will play a major role to support relevant capstone projects, field placements, and applied research, also working on the business case, design, development, testing and validation, and implementation of the Platform and all our solutions. This experience will create a pipeline for students to be meaningfully employed in the technology, health, and life-sciences sectors in Markham.

Partners:
- York University
- Seneca College
- George Brown College
- Ryerson University Innovation Institute

Our engagement process, as well as the active endorsement and cooperation of committed partner organizations, will further expand our partner ecosystem. Markham's ongoing relationship with its Digital Alliance Group provides a forum to engage additional partners. Proper onboarding process will be established as we move forward to the next stage of this process.

Where appropriate, Markham will explore innovative and flexible procurement methods to establish commercial relationships.