



Smart City Challenge – Application Submission

Question 1:

Please provide the following information on your community.

- Name of community: Hamilton
- Province/Territory: Ontario
- Population: 536,917
- Indigenous community: No

Question 2:

Please select a prize category.

- **\$50 million (all population sizes)**
- \$10 million (population under 500,000 residents)
- \$5 million (population under 30,000 residents)

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. (50 words max)

Hamilton will become Canada's most connected community by rethinking the delivery of health, education and social services using technology to significantly improve the health and wellness of residents to be measured amongst the highest in the country.

Question 4:

Please describe the outcome (or outcomes) your proposal seeks to achieve by elaborating on your Challenge Statement. (2,500 words max)

This section should include:

- *Specific goals you hope to achieve by implementing your proposal, justifying both the level of ambition and the achievability of the outcome (or outcomes) sought.*
- *Baseline data and evidence to establish the current state with respect to the metrics used in your Challenge Statement, and context around the outcome (or outcomes) sought.*
- *Evidence to support the selection of this/these outcome (or outcomes) over others, in reference to the needs of the community.*
- *Rationale for applying a smart city approach to achieving the identified outcome (or outcomes).*
- *Strategy for measuring progress toward outcome (or outcomes) and achievement of outcome (or outcomes).*

Hamilton is no ordinary place. It's one of Canada's ten largest cities. It has an aging population – the number of older adults doubling in the next two decades. Mental health concerns and social isolation impact members of our communities regardless of age or social status. Suicide is the number one cause of death for people under 45.

It has an acute care system that is over capacity. In the past year, there was a five-year high in the number of “code zeros” - no ambulances available for 911 calls, and hospitals’ medical surgical beds regularly operate above 110% capacity. Demands are increasing; the trajectory unsustainable.

In parallel, youth wellness indicators show concerning trends. Youth need successful paths to adulthood. 40 years ago, the manufacturing industry was thriving. Hamiltonians could leave high school and make an income that could support a family - an option not readily available today.

Hamilton’s Vision: *To be the best place to raise a child and age successfully.* It was based on consultations with more than 55,000 residents; as part of the Smart Cities Challenge consultations key themes emerged: health, poverty and access to services. Issues that are clearly connected.

A goal to become “Canada’s most connected community” – means changing the way public services are delivered across the city using technology to integrate health, community, education and social services in one fluid system.

It means breaking down barriers that existed in a paper-based world by building digital bridges between the programs and service providers across the city. It means developing repeatable models, scaling them up with smart technology, and connecting them in a way that is replicable across the country. It is public service delivery reimagined to improve health and wellness of the community.

It’s not about technology alone. It’s about using technology to enhance connectivity between people and places. This really is no ordinary place. It’s Hamilton –big enough to make meaningful change, small enough all of our major institutions already collaborate and are committed to moving the community forward together.

Hamilton is home to a life sciences cluster with major education, health delivery and research institutions such as St. Joseph’s Healthcare, Hamilton Health Sciences, McMaster University and Mohawk College. A unique environment, it brings together diverse expertise for ground breaking innovation and delivery, collaborating directly with local start-ups and global business leaders such as IBM Canada, also based here.

Millions of dollars of research investment has resulted in a cluster of highly specialized world leading health institutions. McMaster is unique in Canada for its depth and breadth of research and collaboration focused on older adults, such as the McMaster Institute for Research in Aging (MIRA), including the Labarge Centre for Mobility in Aging, enabling researchers to study mobility from broad perspectives, from social isolation to transportation and the built environment to physical mobility and nutrition. McMaster is also home to the Canadian Longitudinal Study on Aging – a 20 year study of 50,000 Canadians between the ages of 45 and 85, collecting data on the health and social aspects of their lives.

Hamilton is home to a large number of successful services, programs and pilots but a recurring issue is residents don’t know what they are and how to access them. To assist people, a series of different navigator roles have been established but they too have difficulty keeping track of all the program offerings.

Our recent consultations reaffirmed community priorities, highlighting the need for a community that focuses both on prevention to keep residents on the right path and interventions for those who are at-risk or experiencing poor outcomes. An inter-generational approach is needed.

To achieve these priorities we will connect the community in a new way – using people, places and technology to make it smart, responsive and resilient. We will impact the health and wellness of our residents by putting them at the centre of service delivery. Success means focusing on four key areas:

1. Integration and Collaboration: Enabling easy navigation of public services
2. Connecting and Intervening: Better Health Outcomes
3. Prevention and Intervention: Increasing resiliency of youth and at risk populations
4. Connecting Urban Indigenous People and Services

1. Enabling easy navigation of public services

Outcome: A Virtual Navigator for Hamilton – “Hey Hamilton” – to reduce the amount of time people spend searching for common community information as residents or service providers.

Where can I ... ? How do I ... ? Where can I find ... ?

In most major sectors the way one engages, gathers information and obtains services has changed. For example, the ways in which clients interact with banks or retail in a digital world is very different than when residents try to access public services in their community. This can change.

By replicating what’s common practice in other industries, with proven technology, Hamilton will deliver a new way of accessing services and programs in the city – a leading edge public service navigator that connects municipal, education, health care, community and social services, providing users with easy access to information via the web or mobile devices. It would also be capable of communicating in multiple languages.

This will be underpinned by a smart city platform to enable data sharing between the institutions to enhance opportunities for service delivery.

Success will be measured by number of users, number of services accessed and user feedback. Data insights will be used to inform system transformation, an iterative approach.

2. Better Health Outcomes, reducing pressure on acute care services

Outcome: Reduce the City’s 911 call rate increase of by a minimum of 1%, (from 5% annually to an increase of less than 4%) redirecting approximately 670 calls in the first year, avoiding Emergency Department (ED) visits and improving patient satisfaction.

Outcome: Building on Hamilton’s initial Remote Patient Monitoring (RPM) pilot success, we will target a 40% reduction in ED visits and 911 calls in identified high risk cohorts.

Today, the top 5% of patients consume 60% of acute care services. By using the smart city approach, we will reduce this and increase capacity in the acute system.

The approach is multi-fold. Focus on chronically ill and older adults that are the highest consumers of acute care resources. Also, focus on older adults who are on a trajectory of becoming less mobile and at risk for social isolation, with a higher probability of consuming more resources in the future. We will improve patient experience and enable people to age successfully in place.

Data tells us who high-risk patients are and why they access the system. We know some of the care they receive would be better delivered in the community or at home with the right support.

Our community paramedics’ remote monitoring pilot demonstrated that identifying at-risk patients and providing intervention at home provides a better patient experience while reducing pressure on the acute system. We will smart-enable the program and scale it significantly by connecting the paramedics’ program with the McMaster SmartHome Team, using a suite of wearable and ambient sensors in the home, monitoring to improve outcomes individually as well as allow cross-sectional and longitudinal analysis.

Additionally, the Ontario Telemedicine Network (OTN), our provincial partner, has agreed to offer multiple digital tools and services in a combined effort for the first time, bringing a suite of virtual consultation, app-based programs and connectivity services to the Smart City program.

While supporting high users of acute services, this will also inform a broader understanding of what's happening in the system through big data. Including identifying indicators of future high users with opportunities to proactively intervene to improve patient experience, reduce pressure on the system, and enable successful aging in the home.

Research shows that social isolation and loneliness also contribute to a decline in health and wellness. Loss of mobility and hearing are key contributing factors. Leveraging the work of MIRA, we will identify and develop tools that assist in understanding and preventing mobility decline in older adults. In parallel, we'll expand McMaster LIVELab's research on helping older adults with, for example hearing impairments, to use technology – not just hearing aids - to the fullest extent. Mitigating these isolating factors is expected to enhance social connectivity to reduce decline in health and wellness.

Collectively we will develop predictive models and deliver programs that enable prevention.

3. Increasing resiliency of youth and at-risk populations

Outcome: Reduce our youth 'Not in Employment, Education or Training' (NEET) group by 30% to be in line with the federal average.

In Hamilton, 9.3% of youth are in the NEET category, compared to approximately 6% federally.

We know that education is a building block for success, but it doesn't stand alone. Sense of belonging, purpose, and caring adults to mentor young people are also critical factors.

The Hamilton-Wentworth Catholic District School Board (HWCDSB) identified its applied-stream graduation rate as 70% and only $\frac{1}{3}$ of those students go on to post-secondary education.

A gap identified was access to digital tools that enable guidance/career counsellors and students to understand present-day career pathways and opportunities in a format that works for them and is easy to use.

Additionally, youth wellness indicators, such as self-harm, are showing concerning outcomes. We know we need to engage and connect them. The Youth Serving Agencies Network identified that 80% of over 1600 teenagers surveyed did not participate in any recreational programming. They weren't aware of it, were too busy or not interested. In parallel, those same youth indicated their top interests were: a place to go, sports, music, and information on volunteering/jobs. While these programs/services exist youth don't know how to find them.

The Hey Hamilton navigator will be tailored to create a 'one-stop-shop' for youth, co-designed so it meets their needs.

Also, new digital community spaces will be created around the city via a series of mobile and leave behind units. This will provide access to common features such as public Wi-Fi, workshops and computer access. Aimed at increasing community well-being and connectivity, programming will be based on what the community wants, from interactive learning, access to services or simply a safe place to hang out.

Using a multi-partner model we will deliver a digitally enabled support network that makes information and services easy to access. This would be bolstered with immersive learning programs (which exist today on a small scale) to build stronger relationships in the community inter-generationally, support transitions between primary and secondary and demystify post-secondary school to expand horizons when determining a path forward.

We will dramatically scale the McMaster Children & Youth University and fully digitize it, rapidly accelerating their e-book development and their QUESTION-DISCOVER-CREATE model. They engage youth and their families, with McMaster students, in immersive, experiential and interactive learning that is co-designed. Building engaged empowered young citizens and students to build smart cities.

We will also deliver opportunities for residents who want a better way forward to go back to school and pursue post-secondary education, with or without a high school diploma, building on Mohawk's College's access strategy

which delivers that now through community delivered learning.

Connecting the community means bringing institutions to them, such as Mohawk's City School, which offers on the ground in-community programs that encourage people with multiple barriers to engage.

Improving connection to these programs upstream will improve Hamilton's youth and at-risk population's capacity, resiliency, and overall independence, which we know has a downstream impact of reducing stress on the health care system.

Through these combined initiatives we will reduce our percentage of NEET youth and improve the community overall. We recognize this will require a set of indicators to be monitored throughout the program, two example indicators are the HWCDSB's commitment to increasing the applied stream graduation rate to 80% and increasing post-secondary school access to 50%.

4. Connecting Urban Indigenous People and Services

Outcome: Using smart technology to accelerate outcomes of Hamilton's Urban Indigenous Strategy.

Under the leadership of the Hamilton Executive Directors Aboriginal Coalition (HEDAC), this program will accelerate the achievement of outcomes desired by the Indigenous community and the outcomes of Hamilton's Urban Indigenous Strategy.

The ability to easily find and access Indigenous services was identified as an opportunity to improve. The navigator will be customized to enable access to Indigenous services with the potential for it to speak/learn Indigenous languages to deliver broader offering (a model that when successful could be shared with other Indigenous communities).

The Indigenous community in Hamilton also identified that strong grounding in culture and Indigenous identity is a critical success factor for Indigenous youth, led by HEDAC we will use smart technology as a tool that can support Indigenous youth developing connections to their culture, language(s), and teachings, helping enable success in education, health and well-being to increase resiliency through the development and delivery of Indigenous-led content.

More specifically, a digitally enabled approach, such as virtual and augmented reality and artificial intelligence, would enable Elders and knowledge keepers to capture and share information about culture and learning more broadly. With people at the centre, using technology to enhance capacity, real-life teaching and experiences could be supported and supplemented by virtual models that could include topics such as language revitalization to teaching traditional dance. (McMaster's LIVElab is already demonstrating success in virtual dance through the use of avatars.) Measurements would be defined as part of the process by the Indigenous community and in-line with the work of the Urban Indigenous Strategy

Another outcome would be to create Indigenous led content to build understanding among non-Indigenous residents to raise awareness in the community.

Summary:

Hamilton will create an interactive connected community that is easy to navigate, where the programs and services needed are easily located and accessed, where user-experience is paramount as public service delivery is reimagined with people at the centre.

From a population perspective, there is an understanding of the impact artificial intelligence and big data will have when we can understand system usage, identify patterns and be more predictive and preventative to use data to

inform system transformation.

In addition to the outcomes identified previously, the program will establish a benefits measurement framework to help fully understand the impact and monitor progress against the five-year goals. Leveraging work done in healthcare by Canada Health Infoway on the value of connecting health information, a similar model will be established to focus on demonstrating progress on both connecting services in Hamilton and measuring impact on health and wellness of residents.

The City has foundational work underway and partnerships are in place. Hamilton is a microcosm of Canada – rural, urban, suburban, an aging population, a need to increase the resiliency of youth, and a focus on health and wellness.

Hamilton is big enough to make a difference, small enough to make it happen. Investment in our “Little Big City” enables us to build on the resources, expertise and collaborative partnerships to benefit the country. The results of what is developed and tested here can be reliably replicated in large and small communities nation-wide.

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. (1,500 words max)

This section should include:

- *Descriptions of previous engagement with residents, businesses, organizations, and other stakeholders on topics related to the Challenge Statement.*
- *Descriptions of feedback that came to light through past engagement processes.*
- *Links between the Challenge Statement and engagement feedback.*
- *Evidence of efforts made to be inclusive and to represent the community’s diversity.*
- *Plans to sustain engagement through the development and implementation of the final proposal.*

Hamilton used a thoughtful, inclusive and iterative approach to developing the challenge statement which was multi-fold in nature including:

- A review of significant strategies developed over the past ten years;
- Meetings with stakeholder organizations;
- Meetings with individual subject matter experts;
- Meetings with community members;
- Workshops with representatives from multiple stakeholders; and
- An online survey.

The City prides itself on the extensive, formal and informal consultations with residents, community partners, and members of the business community it has conducted in recent years.

Based on feedback received early in the process, and in order to respect the time already contributed to consultations by residents, businesses and public sector organizations, we reviewed what people already told us mattered to them, which were documented as part of previous consultations.

In parallel we conducted initial smart city challenge workshops where we asked a simple question “If we had \$50 million to solve Hamilton’s largest challenges where should we focus?” which provided us with direction for future meetings and consultations.

The review of major institutional strategies and consultations was undertaken included:

- Our Future Hamilton (OFH) – a one year public consultation developed with over 55,000 Hamiltonians and

dozens of community partners creating a 25-year vision for Hamilton in 2016 and which is refreshed annually;

- The City's Strategic Plan – built on the OFH work, this work included consultation with more than 3,000 residents;
- Age Friendly Hamilton (Seniors Strategy);
- Hamilton's Urban Indigenous Strategy;
- Hamilton Executive Directors' Aboriginal Coalition
- The work informing the City's Youth Strategy;
- Teen programming engagement work done by the Youth Serving Agencies Network of Hamilton;
- The Code Red Project;
- The Neighbourhood Action Strategy;
- Hamilton Health Sciences Corporation's *Our Healthy Future* – a 20 year plan for healthcare in Hamilton that was developed in consultation with more than 3,000 people;
- Hamilton Public Libraries Strategic Plan;
- Hamilton Anchor Institution Leaders (HAIL) Community Health Working Group Anchor Project Charter; and
- A review of Public Health population health data.

In addition to these detailed reviews, the Smart Cities Challenge consultation process included dozens of in-person consultations that included residents, as well as subject matter experts that have consulted with 1000s of Hamiltonians, and brainstorming workshops with:

- community members/partners;
- service providers;
- Industry;
- members of the business community;
- leaders from Hamilton's Indigenous community;
- Not-for-profit sector;
- advisors from Global Hamilton, (focused on enabling international students and young newcomers to be fully aware of and have access to opportunities in Hamilton); and
- Major institutional partners.

We also asked for feedback in an on-line survey over six weeks between February and March. All of this information was gathered to build the overarching themes for the proposal and to identify the most significant challenges.

We focused first on what problems needed to be solved and then focused on what would best help to address these challenges, including how technology could be leveraged. More than a decade of research, public consultation and community engagement have resulted in the objectives outlined in this proposal.

Input also included that from:

- all six faculties of McMaster University;
- Mohawk College;
- McMaster Institute for Research on Aging;
- St. Joseph's Healthcare The Research Institute at St. Joe's;
- Hamilton Health Sciences Corporation;
- Public Health Research Institute;
- Boards of Education;
- Hamilton Public Library (a recognized leader in the provision of digital services in Hamilton);
- Public Health to review population health data;
- Ontario Telemedicine Network;

- IBM Canada – located in Hamilton with innovative partnerships with major institutions in place
- Representatives and work from CITYLab, a social innovation partnership between Civic and Academic partners; and
- Private Sector companies with Smart City experience

The themes that consistently emerged were health, poverty and access to services, and a strong commitment to seeing success achieved on the City's Vision "To be the best place to raise a child and age successfully."

We were advised to focus on building out plans that would implement ideas that we've already heard and to focus connecting services that are currently or could be offered.

Feedback also to develop a challenge statement focused on seniors and aging in place, and supporting healthcare being delivered in the most appropriate place to reduce pressure on the system; as well as the need to get ahead of the next wave of those who are deemed to be most vulnerable, to engage youth, and to be more proactive and preventive – working with the other end of the continuum.

Suggestions included focusing on prevalent chronic illnesses that impact residents in the city, like lung disease and heart failure. The need to reduce 911 calls, to shift care from ED services to the community by supporting people before they are in a crisis was also an area of focus. And, we received feedback to better understand what's really behind some of what's driving these issues.

We were also told that new immigrants have difficulty understanding what services are available, and that language barriers are a significant issue. And to ensure programs are also available to rural residents, who sometimes get overlooked.

Aging successfully starts at birth (and even before birth), and youth should not be left behind in an opportunity as large as this one. Mental health, poverty and addiction are significant issues in the city. While there is often a focus on seniors, there are also marginalized members of the community that do feel left behind, that don't get focused on, and while support is likely there for them they don't know how to access it. Residents who need support connecting to the community and getting back on track. Social isolation and mental health and wellness are connected issues affect all ages across the continuum.

Repeatedly through the consultations it was clear there was often a service or a program to address a particular concern or condition, but unless one knew how to find it or had someone to help you, there were barriers to accessing the information or service - the system was not user friendly.

It's clear that providers are standing by to help, but they themselves didn't always have the information they needed to provide the best help that they could.

We were also told that youth engagement and participation is a "must have" to ensure they start and stay on the right path. We should be multi-generational because a genuinely connected community is both digital and social. Strong social systems are inclusive.

And the challenge should have an overarching theme of community health and wellness, and connectedness, to get at the centre of many of these issues, and collectively we can address these broader themes by focusing on the right outcomes.

Notably, as the key themes and major issues were being identified through consultations and strategy reviews, the work of the newly formed Hamilton Anchor Institution Leaders (HAIL) Community Health Working Group Anchor Table was identified. Their work outlines a number of the same gaps identified through the Smart Cities Challenge consultations. A formal project charter was signed in September of 2017, by municipal, business and clinical leadership of Hamilton's major institutions, the Hamilton Niagara Hamilton Brant Local Health Integration Network, the Community Foundation, McMaster Institute for Healthier Environments, St. Joseph's Healthcare - Hamilton, Hamilton Health Sciences Corporation, the City of Hamilton, the Hamilton Family Health Team, as well as

representatives from the community to work together collaboratively to better integrate the health and social sectors to really enable transformational change. An unprecedented institutional commitment is there to solve these challenges.

Hamilton is home to an engaged and interactive community that actively participates in city building and making the city better for the future. After detailed consultations internally and externally, the City and its partners believe the proposed application represents a significant opportunity to address major challenges identified in the Hamilton in an integrated approach that uses smart technology, and builds on existing work, expertise and engagement in the community.

In terms of ongoing engagement, including developing the final proposal, we will both leverage our existing community forums that are associated with the strategies listed above; as well as establish a governance model to oversee delivery that includes resident participation.

Enabling smart citizens and creating an open environment for engagement and continuous participation is a key priority. Residents will be involved directly in each step to ensure we get it right throughout the process. We will also leverage our partners to maximize reach, hosting public workshops by theme. If successful moving to the next round, we will create a citizen advisory panel for the program. In the development of the individual projects we will use an iterative design thinking model that has users engaged from the beginning.

Question 6: (15/100)

Please describe your preliminary proposal and its activities or projects. (2,000 words max)

This section should include:

- *Planned activities or projects to achieve the outcome (or outcomes) set out in the Challenge Statement.*
- *Clear links from the identified projects to the attainment of the outcome (or outcomes).*
- *Scope and size of each planned project in your preliminary proposal, describing how it is feasible and suitable for achieving the outcome (or outcomes) in a manner that is impactful for the community, ambitious, and transformative.*
- *Measures put in place to 1) make the proposal open, interoperable, scalable, and replicable or a description of your plan to do so going forward for the benefit of your own community and other communities in Canada; and 2) enable other uses of the technology, innovation, and data in your proposal.*

The focus is straightforward – increase health and wellness of residents by connecting people, places and technology, delivering a common set of platforms/tools while measuring multiple intended outcomes.

To achieve success we'll focus on key areas, underpinned by common solutions built to apply to multiple scenarios that are easily replicated:

1. Easy access to services – “Hey Hamilton” Virtual Navigator

A city as large and diverse as Hamilton provides countless public and community services. The volume of information available makes services difficult to access. Anyone seeking services in their community should have quick, easy, and accurate access to information without having to wade through piles of booklets or websites; and people who deliver services need easy access to what they need, when they need it.

Providing residents with a new digital customer experience reengineers how public and community services are delivered for the modern world.

Hamilton's Virtual Navigator will be a cloud-based platform accessible from multiple channels depending on user

preference i.e. web, mobile app and smart home device. Data will be aggregated across multiple sources, in a federated model, and presented in an easy to understand format. The “Hey Hamilton” navigator will be built on proven technology. Artificial Intelligence (AI) powered bot capabilities will answer user questions over multiple channels, natural language processing and machine learning will help it distill information. To support newcomers and immigrants, it will be available in multiple languages.

In parallel to improve service experience, big data analytics will be leveraged to uncover patterns and trends to show new insights to institutions to help them understand service requests and gaps. Information will be made available through open application programming interfaces to encourage the development of third-party applications.

This overarching set of tools/platforms the cornerstone of the program, supporting each area while capturing data that can be used to measure and improve performance. It will enable open data sharing and bring additional insights that are used to transform the system.

2. Better Health Outcomes

We know that with healthcare the earlier the intervention the better. To reduce pressure on acute care we will support high needs patients today, while understanding at-risk users from a prevention perspective for tomorrow.

Early identification indicators represent opportunities to proactively intervene before people are in crisis, enabling successful aging in place to improve patient/resident experience.

The digital platforms referenced above, are multi-purpose and capable of allowing Hamilton to support residents from birth to end of life. They will include a cognitive system that learns from and infuses intelligence into the physical world, connecting IoT devices and real-time data to inform better decisions and faster responses. This will be integrated with ambient assisted living, smart home technology, and data infrastructure to create a truly innovative smart city with a focus on the citizen at the centre.

A new collaborative pilot between the Community Paramedics Remote Patient Monitoring (RPM) program (a paramedic proactively monitors patients at-home) and the McMaster SmartHome program, will combine RPM with wearable and smart home technology to enable care in the right place before people are in crisis. A focus on prevention and intervention will quickly reduce 911 calls and reduce emergency department visits.

In addition to participation from our hospitals, we will expand the capability of in-home monitoring and support through digital technology by partnering with the Ontario Telemedicine Network (OTN). OTN’s full suite of digital tools, including those to support chronic disease self-management and virtual eVisits will increase the depth of access to medical services within our community. OTN will use Hamilton as a test bed to roll out existing and new products/services that can benefit residents of Hamilton and be scaled across Ontario if successful.

To enable success the pilot would launch with an initial 500 patients to test capability and demonstrate results. After successfully enabling that group we would add another 500 patients in a model that can continue to be scaled.

Health, wellness and aging successfully go together. With the population of older adults doubling, we know that the majority of seniors want to be able to age in place; we will demonstrate that we can provide better support to enable that.

Research shows that social isolation and loneliness are major contributing factors to a decline in health and

wellness, we will focus on two key contributors: mobility decline and hearing loss.

Mobility decline leads to falls. Falls are a leading cause of injury in Hamilton, one in five seniors reporting falling each year. Building on the RPM/SmartHome program above, the McMaster Institute for the Research on Aging (MIRA) will leverage their platforms/research capacity to identify and develop tools that assist in understanding and preventing mobility decline in older adults.

The combined program will use non-invasive, quantitative sensing technologies to connect older adults and high risk patients, who have chosen to participate, in their homes. In addition to patient support, there will be an emphasis on a variety of factors and indicators. One example is examining differences in how older adults with and without early mobility limitations move within their homes/communities, measuring from various perspectives using sensing technology.

This allows a longitudinal analysis to understand mobility and predict decline by developing indicators. Those indicators can be used as a precursor for fall prevention, early intervention and better enable aging in place. Once developed these tools can be shared, including in the existing longitudinal studies McMaster delivers, across the country.

Avatar based exercise programming will be developed for older adults to improve mobility and encourage engagement, including in the home. This will build directly on McMaster's LIVElab (Large Interactive Virtual Environment) dance for Parkinson's pilot, expanding to a broader audience. LIVElab's ground breaking research on using music, science and technology to improve health and social connectivity will be leveraged to create programming for people with hearing impairments in the community.

Increasing residents' health and wellness and reducing pressure on emergency acute care services will require the community to operate as a team, including patients, caregivers, and front-line staff. Hamilton Health Sciences (HHSC) will build on the success of its early warning system and develop new education models to actively engage people before crisis. Key focus areas will be on those with high impact based on acute care statistics including mobility decline/falls, and sepsis (significant infection).

Through this combined suite of projects we will demonstrate we can reduce pressure on the ED, reduce 911 calls and provide a better experience for residents, while supporting people to age successfully in place. We will deliver models that are replicable in communities across the country.

3. Increasing resiliency of youth and at-risk populations

A key factor identified in increasing resiliency was easier navigation of the programs available. The "Hey Hamilton" platforms/tools will address this and assist in making supporting connections. Success will be measured through participation and engagement in programs, use of service and satisfaction.

From a service provider perspective, an example is providing guidance counsellors easy digital access to current information about emerging and non-traditional career paths. Content will be provided through support from post-secondary institutions with a physical presence in the community. This can support all students. McMaster University and Mohawk College are committed.

Use cases will be identified and mapped through co-design as we aim to create and build on collaborative

programs that exist today.

Recognizing Digital Inequity or the “homework gap” (no access to technology or the internet) are increasing issues, an incentive program will be created to encourage long-term participation i.e. data plans and devices, transit passes. An initial goal is increasing successful graduation rates amongst the applied stream of students by 10% schools in the Catholic School Board and increasing post-secondary school enrollment in that group by 15%. Longitudinal success will be monitoring through big data analytics. The public board will also participate in the program.

To support school transitions McMaster’s Child Youth University (MCYU) is on-board. A unique community outreach initiative focused on demystifying post-secondary school for kids 8-14 years old, delivering on-campus lectures so kids and their families can explore the University to reduce barriers.

This is coupled with MCYU in the City: Science, Technology, Engineering, Arts, and Math (STEAM) workshops delivered in the community to provide hands-on learning. McMaster students participate in content delivery.

Currently they are developing their first e-book – understanding water, this interactive e-book adjusts to the age of the kids, who can interact with bots and facilitators as they learn. The book will adapt as the user decides various outcomes and kids co-create content like a wiki.

The program encourages critical thinking and youth engagement. It parallels the Ontario school curriculum to link subjects like math, science and social science to show how they address practical challenges in the community.

MCYU could scale that immediately, partnering with the library to empower more kids and develop five more e-books, openly shared, replicable across the country.

Additionally, new multi-purpose digital hubs will play an important role in program delivery and social connectivity. Taking service to you, we will replicate the Hamilton Public Library (HPL) Central model where service providers are co-located.

Deployment will focus first on at-risk areas, such as large city housing complexes that often require multiple services in tandem, like Vanier Towers. This will provide the community easy access to services and service providers with a central point of contact in a community hub.

Three models will be delivered, with flexible staffing depending on community needs, while offering common tools (public Wi-Fi):

1. Five outdoor hubs set as new facilities in parks/neighbourhoods on a more permanent basis, tailored for workshops, device lending, and access to computers.
2. Five modular indoor hubs for rec centres, community centres, enabling digital resources, access to community library resources, free printing/charging.
3. Three fully mobile interactive-digital bookmobiles that move around the community as pop-up libraries delivering specialized community programming with access to digital tools/resources. This would include parks, community events, seniors home and long-term care.

These 13 hubs are estimates, scalable with demonstrated success and private sector investment opportunities. They offer connectivity and a variety of digital services, and provide additional safe meeting/educational places for people to use/interact.

Community connectivity is more than digital it’s social and inter-generational. We plan to encourage older adults

to volunteer, leveraging the potential of our older community to connect with youth.

For those who may not have finished high school and want support in developing a path forward, Mohawk College is a front-line leader in post-secondary access and poverty reduction.

The program will also focus re-engaging those who may have left high school unfinished and require non-traditional opportunities for completion. Building on their innovative community based programming and deep community engagement to increase resiliency, Mohawk's City School will be expanded to reach more of the at-risk community. Delivered directly in neighbourhoods, they provide free credit and non-credit courses and workshops for populations that experience below average postsecondary attainment due to social or financial barriers. The communities it serves participate in program selection, the new model will be digital focused and enabled.

In Canada's most connected community, no one gets left behind.

4. Connecting Urban Indigenous People and Services

Under the leadership of HEDAC this program will accelerate the achievement of outcomes desired by the Indigenous community and the outcomes of Hamilton's Urban Indigenous Strategy.

The Navigator will be tailored to connect people to the Indigenous services available in Hamilton. There is also the potential for the Navigator to support Indigenous language revitalization.

The Indigenous community in Hamilton can use smart technology to support youth in developing connections to their culture, languages, and teachings, to help enable success in education, health and well-being, increasing their resiliency through the development of Indigenous-led content. As part of this process, collectively we will seek to build understanding of Indigenous histories, knowledge and experiences for non-Indigenous residents to strengthen the community as a whole by creating content to increase cultural awareness.

This will require replication of platforms/tools and services for a new audience and Indigenous led governance, and by extension demonstrate the capability to share in other settings across the country.

Question 7:

Please describe the ways in which your preliminary proposal supports your community's medium and long-term goals, strategies, and plans. (500 words max)

To supplement your response, please provide any relevant documents and make clear linkages and references.

Given a major component of our consultation included reviewing previous consultations and key strategies, the Challenge Statement and projects are anchored in delivering in-line with objectives of the below documented strategies:

- Our Future Hamilton – the City's 25-year Community Vision
- Urban Indigenous Strategy
- Work informing the development of the Youth Strategy
- Age Friendly Strategy (Seniors Strategy)
- Community Health Working Group Anchor Table Project Charter

Specifically, we reviewed the intended outcomes of the above strategies and mapped where the projects to

address the Challenge Statement would move us towards objectives by using smart technology. There is significant synergy between our medium and long-term goals, the objectives of these strategies and the intended outcomes of the projects supporting achieving the Challenge Statement as outlined in the previous sections.

Projects:

1. Easy access to services
2. Better Health Outcomes
3. Increasing Resiliency of Youth and At-Risk Populations
4. Connecting Urban Indigenous People and Services

These are some examples:

The Urban Indigenous Strategy is supported by aspects of the four areas.

Hamilton's most significant public engagement was a year-long exercise that engaged over 55,000+ residents to develop a 25-year vision for the community, with six priorities, 81 key directions and 57 signs of success. Four priorities directly aligned to this work and were impacted in the medium and long-term. **Our Future Hamilton strategic priorities:**

1. **Community Engagement and Participation** - an open, transparent and accessible approach to City government that engages with and empowers all citizens to be involved in their community.

This priority includes:

- openness and access to information
- provide easy access to information about government service
- governments and community institutions embrace a culture of openness and transparency

This is a key outcome of the project #1. Dramatically improving ease of access to information and services. Openness and transparency is a core requirement.

2. **Economic Prosperity and Growth** - a prosperous and diverse local economy where people have opportunities to grow and develop.
 - Develop and use technology to increase access to education for all ages
 - Reliance on social assistance programs has decreased
 - Poverty rates are low
 - Identify and remove employment barriers and provide opportunities for all

The projects described, particularly #3.

3. **Healthy and Safe Communities** – a safe and supportive city where people are active, healthy, and have a high quality of life.
 - Integrate the healthcare system to make it easier for people to navigate
 - Improve the health of Hamiltonians by actively working to address the social determinants of health
 - Encourage home and health care facilities for the aging

All projects directly support this.

4. **Culture and Diversity** – a thriving, vibrant place for arts, culture, and heritage where diversity and inclusivity are embraced and celebrated.

- Recognize and celebrate Indigenous traditions
- Provide activities and gathering spaces to help seniors maintain active and productive lifestyles
- Provide opportunities and supports for all children and youth to achieve their goals and aspirations
- Provide services and supports for people living with disabilities to live active lives

Project #2, 3, 4 are aligned with this priority.

Question 8:

Please describe your community's readiness and ability to successfully implement your proposal. (1,000 words max)

This section should include:

- *Experience with implementing complex projects (i.e. multi-stakeholder, multi-dimensional) that span multiple business lines and functional units.*
- *Structures, processes, and practices in place or planned for managing and implementing complex projects that span multiple business lines and functional units.*
- *Organizational strengths and potential weaknesses for managing and implementing a smart city proposal, and plans to address weaknesses to ensure successful proposal management and implementation.*

A city of over 500,000 residents, with major health service providers and leading post-secondary institutions within its city-limits, Hamilton has big city size and resources but is small enough the major institutions sit around one table to enable change.

In fact, in 2018, Hamilton was recognized as a global TOP7 Intelligent Community for its commitment to progress digital infrastructure, equity and advocacy. A big part of that recognition is the innovative work and program delivery of our major institutions, as well as our willingness to work together, which the Intelligent Community Forum described as "world class".

The Hamilton Anchor Institution Leadership (HAIL), is Hamilton's largest public and private sector members: City of Hamilton, St. Joseph's Healthcare, Hamilton Health Sciences (HHSC), Local Health Integration Network, the local school boards, Hamilton Police Services, McMaster University and Mohawk College, Chamber of Commerce, ArcelorMittal Dofasco and the Hamilton Roundtable for Poverty Reduction.

There is a collective commitment to build bridges between institutions and across sectors to solve challenges. Sub-tables have been formed to lead on major issues. One is the Community Health Working Group, which in the fall of 2017 reached a formal commitment to support an integrated health care and social support system between the leadership of Hamilton's major institutions, the Hamilton Family Health Team, and community representatives.

The players are at the table, we have a foundation in place.

Hamilton also has significant experience implementing large, complex projects. Here are some examples:

HHSC is the second largest hospital group in Ontario, and home to one of the largest regional electronic health record implementations in North America (ClinicalConnect™). In a multi-disciplinary partnership model (provincial, regional, local) HHSC led the integration of all acute care hospitals in the region and a number of provincial assets (labs, diagnostic imaging). It is now deployed to over 40,000 users serving over 3.6 million people (for context Alberta has 4.2M).

Recognizing governance was a critical success factor that provincially funded implementation was overseen by a multi-partner/multi-stakeholder governance model. That program represented in excess of \$100 million in direct investment, and hundreds of stakeholders representing thousands of providers.

HHSC remains positioned with regional scale technology delivery capability and change management services.

HHSC also has formal partnership with IBM Canada for health innovation. Based out of a dedicated innovation space in downtown Hamilton; specifically designed to enable innovators and experts from HHSC, IBM and the Hamilton healthcare ecosystem to interact, ideate and collaborate.

As a key partner, given their investment and existing partnerships in Hamilton, we will look to leverage IBM's global leadership in the Smarter Cities initiatives.

MIRA has mobilized 80+ researchers from all six faculties and multiple disciplines to coordinate their efforts to enhance the University's research strengths in aging. MIRA serves as an entry point to McMaster's well-established platforms in aging research and knowledge translation, such as McMaster Optimal Aging Portal, and the national coordinating centre for the Canadian Longitudinal Study on Aging (CLSA); a 20 year study of 50,000 Canadians aged 45 and 85 at recruitment, collecting a very robust data set on the health and social aspects of their lives.

The Hamilton Public Library (HPL) is internationally recognized as a leader in technology adoption; seeking out new services and partnerships that help better serve the community – physical, virtual, and cultural. They have a multi-service approach, co-locating with other partners, such as the City and Mohawk. If given the resources, HPL can execute on leading delivery of the digital hubs.

Another readiness example is the Mayor's Intelligent Community Task Force, which works directly with the community, private sector and telecommunications industry to identify gaps in our broadband infrastructure and service offerings. Our goal is to collectively work towards a Digital Hamilton that is purpose built for the future.

To become Canada's Most Connected Community we will establish a cross-institutional governance model that will include citizen representatives to guide the program – a model we know works. We will also work within our existing structures and build on the deep community engagement that exists today. A co-design approach in program delivery will be used.

Change management, communication and ongoing resident engagement will be critical to success. To address any concerns about access to data, we will deploy 'privacy and security by design' principles throughout the project.

One weakness is a gap in the availability of rural broadband infrastructure and access to digital services. A component of our proposal will be to close that digital gap to enable more programs to be delivered there – including the digital hubs, which will build on the programming of HPL for our rural residents. Our telecommunication partners have indicated a willingness to partner together with the City to begin to close these gaps in rural digital infrastructure.

While we recognize that size and number of partners may be viewed as an obstacle, we know that it's not. The HAIL table demonstrates we already work well together, and we have extensively consulted to ensure alignment with organizational priorities and capabilities. As mentioned we will employ a multi-partner governance model that includes a steering committee, and working groups by stream to enable success, with citizen representation. We are committed to collaboration and success.

Previous experience and planning is a clear strength. We are combining the intellectual and delivery capacity of our major institutions to reach common goals in the community. In a multi-partner model we will ensure delivery is managed by an overarching program that will oversee successful implementation. The City will act as a primary point of accountability, with clear roles and responsibilities for each partner from the outset.

We know we have many of the foundational pieces and that this is achievable – the gap in scaling these pieces was lack of funding and access to smart technology, which this proposal addresses. As evidenced, we have world class institutions that routinely work together effectively. What gets built and delivered here can be rolled out and replicated anywhere. Hamilton has the experience and the capability to deliver. It really is no ordinary place.

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. (500 words max)

The preliminary proposal was built via a small number of City staff, with partners participating in-kind. Funding from the grant would be used to create a small, dedicated team with the necessary business, technical and engagement expertise to build a final proposal that is in a ready-to-execute position once approved.

Roles will include:

- Digital Design and User Experience lead with funding for resident engagement workshops, co-design sessions and advertising to maximize community participation.
- Project Manager (to write the project charters/plans)
- Project Coordinator (to work with the PM on the overarching schedule)
- Technical Consultant (conceptual architecture development and POC)
- Business Analyst (provide input into the proposal)
- Stakeholder Engagement Lead
- Contracts manager (to write up partner MoUs)

Deliverables are expected to include:

- Development of a cross-partner asset map/inventory of existing products, services, and organizations that can contribute to enable technical design.
- A multi-stage draft implementation plan.
- A community engagement and marketing plan to enable an on-going two-way dialogue with the greater community and stakeholder throughout the proposal, including delivering multiple co-design workshops.
- A draft model for the multi-partner governance, with agreement on roles and responsibilities.
- An on-going engagement model to support the program.
- Baseline procurement documents so the program is in a near ready position.
- Preliminary proposal for digital hubs and physical locations in the community.
- Working with private partners to increase the reach of the resources and initiate pilots.

Our partners have continued to express in-kind support in the next phase, which we believe can be supplemented with private sector in-kind support.

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. (500 words max)

This section should include:

- A description of existing partners (what type of organization, what they do, etc.), their relevance, and expected contribution to the outcome (or outcomes).
- Where partners are not yet determined or where it is anticipated that additional partners are required, describe the process for selecting them.

Hamilton Executive Directors' Aboriginal Coalition

Leaders in the Indigenous community who will guide program development.

OTN

Independent, not-for-profit funded by the Ontario Ministry of Health and Long-term Care manages one of the most comprehensive telemedicine networks in the world. Using advanced technologies, OTN supports the delivery of clinical care and virtual education across Ontario.

OTN's partnership provides the availability of a comprehensive suite of digital tools for residents and health care providers. OTN is well positioned to assist with health and wellness objectives. OTN is interested in focusing their collective services in a geographic area and providing the digital tools to evaluate the health status of citizens over time.

HHSC:

One of Canada's leading hospital systems and a recognized leader in research and innovation. Their role would be multi-purpose: clinical, technical and educational. HHS has agreed to participate in every aspect of this proposal:

- Clinical participation
- Leveraging their in-house technology delivery team they are prepared to participate in technology acquisition, delivery and implementation
- Expanding their existing innovate partnership with IBM Canada, which currently includes a joint collaboration space and the use of IBM Watson Artificial Intelligence (AI) as examples.

IBM Canada:

Acknowledging, IBM has formal partnerships with two major institutions where they are leveraging proven technology for innovation today, we will look to leverage IBM's global leadership and knowledge in the Smarter Cities initiative along with understanding as it relates to AI, machine learning, natural language processing, big data, analytics and the Internet of Things (IoT) technologies.

Mohawk College:

One of the top colleges in Canada for applied research, with a long and successful track record of collaborating with industry leaders. They are positioned to provide support across the themes.

St. Joseph's Healthcare

Premier academic and research healthcare organization – participating in the clinical and research components of the proposal.

McMaster

One of the top 100 Universities in the world, McMaster has committed the full weight of its innovative research and program delivery capabilities across the various themes i.e. SmartHome Team, LIVELab, McMaster Children and Youth University.

MIRA:

Has the infrastructure/capacity to identify required data that will enable the implementation of specific ICT initiatives. They are also positioned to collaborate on implementing the required tools for extracting data, harmonization, integration and analytics. And to partner in the longer term solution that requires data collection and processing, which will allow the teams to “make sense” of the big data generated.

Hamilton Public Library

Recognized leader in the delivery of digital programming, positioned to lead the digital hub implementation.

Undetermined partners:

Partnerships will be subject to governance and procurement requirements as appropriate. This will be determined upon in the final proposal stage, including identifying, evaluating and leveraging additional private sector investment opportunities.