

QUESTION 1

Applicant information

Name of community:

CALGARY

Province/Territory:

ALBERTA

Population:

1,239,220 (2016 CENSUS)

QUESTION 2

Prize category

\$50 MILLION



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QUESTION 3

Challenge Statement

Calgary will revolutionize to become Canada's most inclusive and resilient community by connecting all Calgarians, enabling access to the services, supports and information they need to be engaged and lead fulfilling lives AND increasing economic diversification to create more job opportunities.



QUESTION 4

Outcomes

Imagine a city where ...

- low-income families can ensure their school age child will play hockey next season because they have connected with the right agencies that provide recreation subsidies.
- an innovative start-up has everything they need in one location to seamlessly design, build and launch services that have worldwide impact and reach.
- researchers discover ground-breaking technologies by leveraging connected infrastructure and successful experimentation with state of the art resources and support.



Imagine the possibilities in a city where all residents, businesses and researchers have the tools and means available to connect and access the services, supports and information they need to be engaged and enjoy a life full of endless opportunity.

This is Calgary.

The future is here and we are ready.

As a community, we have collaborated to identify our biggest challenges and solutions that will work towards an even better Calgary.

We have the talent, desire and commitment to make great things happen. Our outcomes are bold and aim to impact all Calgarians, starting with our most vulnerable citizens first.

We will take a phased approach to our solutions and use a human-centred design framework that ensures our citizen’s voices are at the core of the outcomes and projects delivered.

Based on our compelling body of evidence and data, and utilizing a human-centred design approach where solutions are focused on what the people in our community truly need, the following outcomes have been developed. We have **engaged**, we have **listened** and now we will **take action** to create better lives for the people who make up our community.



Calgary’s metropolitan area grew

14.6%



between 2011 and 2016 – almost 10% higher than the national average.

Outcomes

1. Calgarians are connected

Our goal is to bridge the digital divide by ensuring all Calgarians have equal opportunity to access affordable and fast technology and data – putting everyone on equal footing. Increasing affordable digital connectivity for all Calgarians will provide people with more access to services and resources, opening up opportunities for them to engage with their communities in new and different ways.

Under-engaged and vulnerable populations will be able to fully participate in the economy when we increase connectivity and digital literacy within our community. This will unlock new employment opportunities, training programs, educational programs and connections with family and their community.

In return, our population will bolster our economic diversification by increasing output in our economy and will feel that they are connected and belong to their communities.



Measure

We will measure this outcome by understanding the current state of digital divide and digital literacy for low-income Calgarians, by increasing the number of Calgarians that have the means to access the internet as well as the creation and implementation of a model for public-private, 5G-enabled zones.

2. Calgarians have access

Ensuring all Calgarians have the ability and awareness to access resources they need, when they need it, is crucial. We aim to deliver a personalized, easy-to-use interface for our community to gain access to services, resources and information and get the support they need to thrive in today's world. If an individual needs support, they should be able to access appropriate resources quickly and simply, and options ranging from government agencies, to social organizations, to the business community should be offered so they can be empowered and informed when making decisions. Through the development of a personalized service portal for Calgarians, we will ensure that they are maximizing their use of appropriate services offered in the community, thereby allocating resources efficiently and effectively. Side benefits would include increased collaboration between service providers and the potential for increased efficiency in operations between these shared services.

We also aim to build a system for a secure, opt-in biometric-enabled digital identity that leverages blockchain technology. Such a system facilitates instant, seamless access to digital services for our community. To start, the primary audience will be vulnerable individuals in our community, with potential to build this capability out to our greater community. The benefits range from a person experiencing homelessness having a digital identity to easily access services, to supporting a single parent and their children in an emergency shelter gaining access to financial services in a timely fashion.



Measure

We will measure success for this outcome by better understanding of the current state of access to services, the development of an entryway (uptake, adoption, satisfaction) and successful implementation of blockchain platform to support secure biometrics identity enablement.

3. Economic diversification and jobs for Calgarians

Calgarians will have job opportunities and the skills required to have secure employment (through relevant training) which will help diversify our economy. Living labs, as an example, create the intersection where people, ideas, investment and assets collide to accelerate innovations in IoT, Autonomous Vehicles, Drone's, 5G deployment and numerous other innovations.

A smart city approach to this outcome means using data to match Calgarians' current skill sets with emerging technologies and new industries where they can utilize skill sets or identify educational/training programs to re-train and adapt to emerging industries.

New technology, such as apps or social networking platforms, will also help connect entrepreneurs with investment, bringing big ideas to fruition and supporting investment in our local economy.



Measure

This outcome will be measured through a defined current state of industry needs for living labs, adoption rate of lab participation, increase in number of new businesses or products to market, number of open technology job postings and successful technology companies and growing our non-oil/gas industries from 68% to 72%.



Our outcomes reflect where we are now, where we want to go and what we value.

We partner. Our smart city agenda brings together social agencies, academia, innovators, entrepreneurs, industry and government. There is a momentum growing and great excitement to leverage technology and data for Calgary.

We are resilient. Over the last 10 years, Calgary has proven itself to be a resilient city¹. We were strong and adaptable to meet the challenges we faced, from climate-related events, to economic downturns and social changes. We are a world-class city. Through a variety of ups and downs, Calgary continues to take great steps forward.

We evolve. In adversity, we have found our strength and come together as Calgarians always have. Calgary is now at a transformational period in its history. We are on the precipice of exciting change. We will seize this opportunity to socially and economically diversify; we're taking this opportunity to accomplish even greater things.

We empower. Calgarians value shared social and economic prosperity, where there are opportunities for people to empower themselves. We are working to increase access to our economy through employment, education, mentorship opportunities, volunteering - in whatever ways Calgarians feel they are leading a fulfilling life.

We care. Our community-focused spirit shines through. During the 2013 Flood, Calgarians pitched in to help neighbours, community members and strangers recover from one of the most challenging events our city has ever faced. More recently, during the economic downturn, Calgarians have supported each other financially and through community-based organizations, ensuring our citizens are taken care of.

Calgary is also consistently ranked among Canada's most philanthropic cities and half of all Albertans give their time to volunteer or support their communities – we are a community that gives, cares, and looks out for one another. We will work together to continue to improve our citizen's lives and experiences and invest in making Calgary an even better place to make a living and a life.

We innovate. Calgarians are innovative people and our community's advantage is our entrepreneurial spirit, one that's open to new ideas and not afraid to pioneer new initiatives. We have one of the youngest, energetic workforces of any major city in Canada², a high rate of small business ownership, a burgeoning tech sector, a talent pool of world class researchers, and a highly educated workforce that is skilled and adaptable. This combination makes our city suitable for implementing new and emerging technologies, testing what's never been done before and challenging the status quo. Calgary has always been a city that adapts to a changing environment and we have a population that evolves with it.

We are growing. Despite Calgary recently going through one of our worst economic downturns, we continue to grow. On average, Calgary has led Canada's economic growth for years and has consistently grown faster than the national average. Calgary's metropolitan area grew 14.6% between 2011 and 2016 – almost 10% higher than the national average³. This rapid growth has meant that there are more and more new Calgarians in our city and along with them, new communities and neighbourhoods with individuals and families looking for ways to connect to their city and their communities – ways to establish relationships with one another.

¹ <http://www.calgary.ca/PDA/pd/Documents/Imagine-Calgary/Resilient-City.pdf>

² <https://www.calgaryeconomicdevelopment.com/research-and-reports/demographics-lp/demographics/>

³ <http://calgaryherald.com/news/local-news/calgary-still-canadas-fastest-growing-city-new-census-data-reveals>

The power of connection

Connecting all Calgarians to the services and information that they need, streamlining access and offering opportunities for meaningful participation in our economy through job skills training, education and employment, regardless of socio-economic background, will have exponential effects on the city and our economy.

When people are connected, they have the opportunity to be more engaged – in employment, education, and to one another. By increasing the participation rate of Calgarians in the workforce through connection to technology and information, we can include an untapped talent pool into Calgary's economy. This can increase economic output. For example, by increasing the workforce participation rate of lower-income Canadians, studies have shown that Canada could add \$38 billion to GDP⁴. **Imagine** the possibilities and the benefits that Calgary could reap by providing access to information, services and opportunity to lead fulfilling lives for all Calgarians.

Calgary will weather any economic challenge we face by linking people and resources through technology and data. Being connected will allow prospective workforce talent to find employers in need of labour, and will provide vulnerable Calgarians with access to training and educational opportunities to prepare for the workforce or re-train to adapt to the changing needs of the business community. It could equip people so they can shift with emerging economic trends, developing skills for the future. It would also ensure that all Calgarians are included in the benefits of economic engagement – providing equal opportunity for access to information and services and creating a level playing field for citizens. Calgary has the potential to provide opportunity for empowerment to our entire community.

When people are connected, they have the opportunity to be more engaged – in employment, education, and to one another.



Meeting our community's needs

There have been many reports in recent years that indicate Calgary needs to diversify its economy from our current resource base. The downturn in the oil and gas sector has affected employment, Calgary's unemployment rate was at 8% in March 2018, nearly 2% higher than the national average at 6.2%. In addition, as evidenced by the Enough for All report, 10% of our city's population lives in poverty (127,000 Calgarians).

The Calgary Foundation conducts a yearly Vital Signs Survey asking citizens to rate living standards, community connections, arts, environment and wellness. In 2017, this survey found that 78% of Calgarians reported they were concerned about the level of poverty in our city, with 25% of respondents rating their ability to find suitable employment as poor or below average. Calgarians overwhelmingly believe that poverty is a risk to our city. When asked what Calgarians value most, 79% of respondents replied 'relationship' demonstrating that above all else, Calgarians value connection to one another, building community, and feeling that they belong.



10%
of calgarians
live in poverty.

Being connected to one another means that Calgarians want to be engaged, want to be involved and want access to opportunities to build relationships – a strong theme in this research. Results also showed that 14% of respondents were unable to afford food, shelter, and clothing and 47% were affected by loneliness. Connection to one another, to one's community, a sense of belonging and poverty reduction are all identified as areas Calgarians would like to see improved.

The City of Calgary (The City) conducts a Quality of Life – Citizen Satisfaction Survey each year and the 2018⁵ Survey revealed that 60% of respondents would like to see increased investment in social services for individuals. Providing investment in our social services, including increased access to information and services available to citizens, is a significant result from our extensive community engagement.

Calgarians value connection to one another, building community, and feeling that they belong.



⁴ <https://www.budget.gc.ca/aceg-ccce/pdf/workforce-marche-travail-eng.pdf>

⁵ <http://www.calgary.ca/cfod/csc/Documents/2017-Citizen-Satisfaction-Survey-Report.pdf>

Why a smart city approach?

Calgary is at a pivotal moment in its history. It is times like these where rapid change through innovative thinking goes together with a smart city approach. Our city is faced with challenges that are best solved when multiple influencers come together to collaborate to find unique ways to solve our problems.

A smart city approach will help our city become more sustainable by bringing openness to data sharing and technology between our community, building trust and transparency between our municipal government and our citizens.

By making our data truly accessible, useable and barrier-free, we will foster an environment of trust and collaboration between citizens, government, public organization and businesses and spur innovation to better manage limited resources for the benefit of the whole community.

By integrating data and connected technology, we will empower communities to break down silos that exist within local governments and public organizations.

Some of our outcomes and projects are very ambitious and we may have never delivered something of this caliber for these solutions. Due to some of the unknowns we uncover, we will work as a community along with partners to determine the best way to measure as we build out the detailed workplan for the final submission. We will bring together project teams that will deliver towards our defined outcomes. These project teams will measure the progress towards outcomes by creating a comprehensive outline of each proposed project including goals, milestones, and key project indicators (KPIs). Regular check-ins with stakeholders and end-users will ensure the projects are on-target. Our phased approach will require work breakdowns to deliver in sizable pieces of work which supports the ability for other communities to replicate work done in Calgary.

Smart ideas make great communities

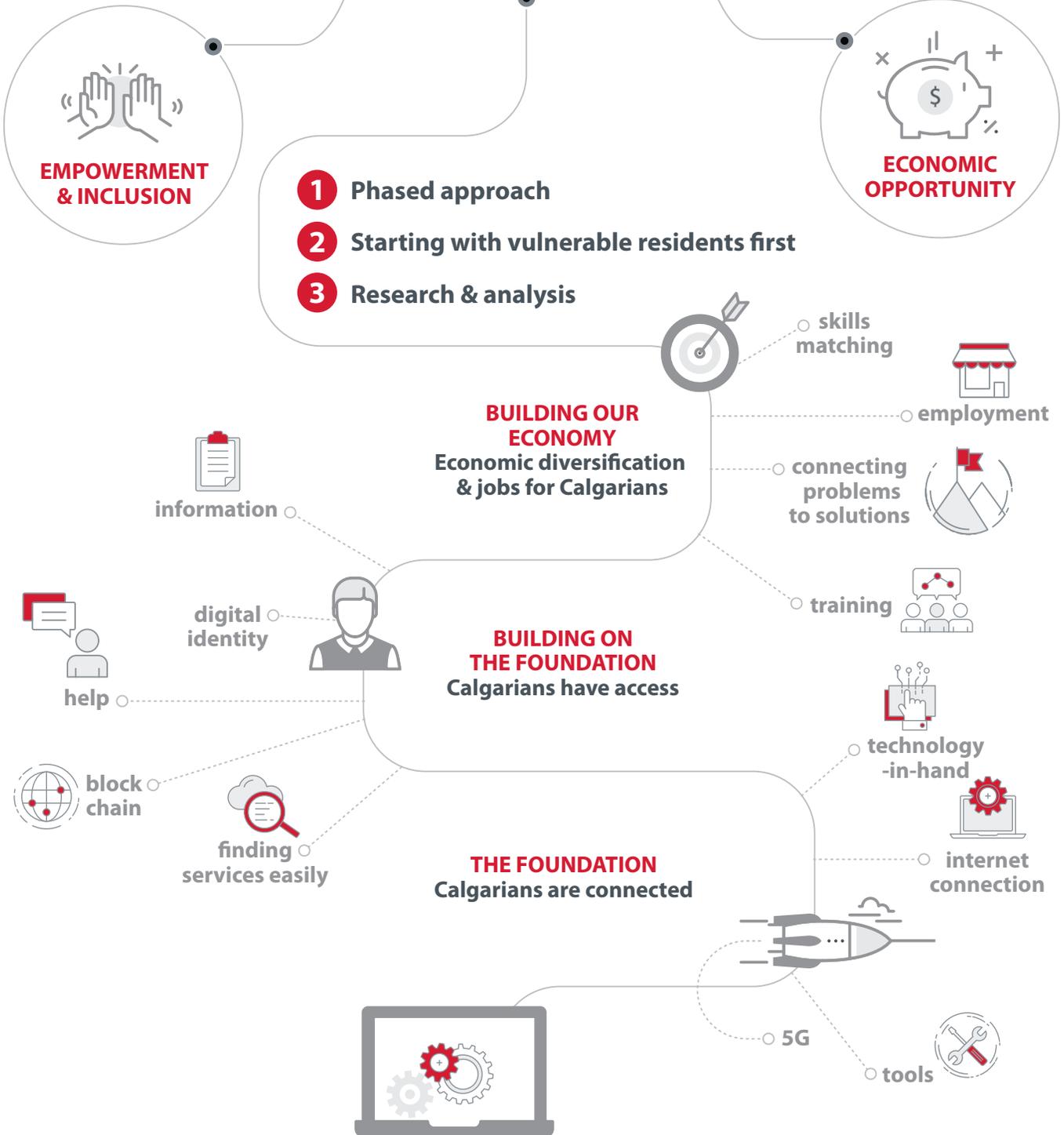
Calgary's outcomes are transferable to other communities throughout Canada. While some of the root causes of our challenge are unique to Calgary, our outcomes are likely common goals that most communities in our country can align with. Our open, transparent approach to sharing the technology and data that will support our outcomes will ensure other communities in Canada, large or small, can adapt our learnings and implement them for the betterment of their citizens.

We believe in the value of a collaborative spirit that extends not only to our region, but to our fellow communities across Canada and the world.

We are better together.



Calgary will revolutionize to become Canada's most inclusive and resilient community by connecting all Calgarians, enabling access to the services, supports and information they need to be engaged and lead fulfilling lives AND increasing economic diversification to create more job opportunities.



Over the past two years, The City has engaged thousands of individuals through quality of life surveys, workshops, engagement sessions, expos, social media and online platforms, asking Calgarians how to make our city a better place to make a living, a better place to make a life.

This engagement has contributed to the understanding of what is important to Calgarians, what our community values, and what they need.

Through our Quality of Life and Vital Signs Surveys, Calgarians overwhelmingly identified that they valued relationships and feeling connected to one another and their community, that they believed Calgary needed to do more to reduce poverty and that our economy was a challenge that needed to be addressed. These themes all influenced the creation of our Challenge Statement.

Calgary is a member of the 100 Resilient Cities initiative, pioneered by the Rockefeller Foundation. This worldwide collaborative works to identify ways to be resilient to the physical, social and economic challenges that are a growing part of the 21st century. As part of this initiative, significant engagement workshops were held in March 2017 which brought together citizens, leaders from Calgary's civic and community organizations, businesses, foundations, academic institutions, and government agencies. Over 650 stakeholders participated in these conversations in-person and through live-streaming. We made every effort to ensure that these engagement sessions were accessible and open to all individuals who were interested in participating.

The themes of community building, community connection and connections to one another, specifically as it related to Calgary's resilience following the 2013 Flood, were identified by most participants in this engagement.

This need for connection continued to resonate strongly.

The 100 Resilient Cities engagement also identified that 'more than 90% of Calgarians agree it is important that Calgary find a greater balance between oil and gas and other types of businesses in its local economy.' This theme has also been incorporated into our Challenge Statement.

Other themes that were common to previous engagement sessions related to feeling included, resiliency in the face of shocks and stressors, and providing more opportunities for Calgarians to become engaged in their communities.

In addition to previous engagement opportunities, the Smart City team held dozens of preliminary meetings and group discussions with community leaders, academia/researchers, technology leaders, social agencies, utilities and mobilizers to discuss their perspectives on what would make Calgary a better place using data and technology.



2

**community
workshops.**

From February 20 to March 5, 2018, through our already-existing Civic Innovation YYC online portal, we asked our residents to define what they felt were Calgary's biggest challenges. Promotion of the online platform saw over 1000 visits and was primarily done through social media. Paper placards were displayed near computers with internet access in libraries and social agencies asking Calgarians to submit their ideas online. Key themes were community, inclusivity, efficient and easy-to-use services, jobs, safety, accessibility, livability, affordability, education, health and recreation.

On March 7 and 8, 2018, we took the opportunity to engage with over 200 Grade 5 and 6 students in person during The City's Safety Expo. Students enthusiastically shared their thoughts on smart cities and what they thought Calgary might look like in the future through impromptu brainstorming sessions and visual mapping. These students shared some ideas around the role of robots and self-driving cars/spaceships, but they also cared about being connected, feeling included and having a sense of belonging in their community, among their peer groups and in social networks. These are important and challenging things in today's world – let alone in the future.

On March 14, 2018, a community workshop brought together representatives of the Smart City Community Team. This team consists of a cross-section of leading community-based organizations, including academia, social agencies, technology and innovation leaders, who play a critical role in helping to engage and include Calgarians from a variety of backgrounds and groups in the implementation of our projects and activities, ensuring a broad cross section of Calgarians are influencing our outcomes and activities.



88

innovative ideas shared.

The emerging themes and comments from our public engagement were shared at this workshop, along with the many inputs of already-existing research collected through extensive engagement efforts. This existing research included:

- Enough for All - poverty reduction strategy
- Calgary's Economic Strategy
- Vital Signs – Calgary Foundation
- Resilient Calgary research and engagement
- Quality of Life Report
- Citizen Expectations & Council Directives

The result of this workshop was the beginning of the formation of our community's Challenge Statement.

From March 19 to April 2, we shared Calgary's draft Challenge Statement on our online platform and asked citizens to share bold and ambitious ideas and solutions of how connected technology and data could improve economic opportunity and empowerment and inclusion in our city.

The public shared a total of 88 insightful smart city ideas which highlighted the pulse of our community and helped inform the direction of our submission through key themes identified.



Residents were engaged and meaningful conversations and connections were sparked. Through a match-making process, we will further engage with submitters to link City and/or community representatives together.

On April 5, 2018, the Smart City Community Team reconvened for a follow-up workshop to discuss the themes and ideas that emerged and reviewed the Challenge Statement once again to ensure it reflected our community's perspectives. Together, we identified the prominent outcomes and activities that could be undertaken as part of the Smart Cities Challenge for our city.

These engagement insights clearly show that Calgarians want to have better connections to community and stronger relationships within their communities, as was already confirmed through the Vital Signs Survey and the Resiliency Engagement Sessions.

These themes of resiliency, inclusion in the community, well being and poverty reduction all influenced the development of the final Challenge Statement. Through connecting individuals to each other, to services, and to opportunity, Calgarians will feel included and engaged in their broader community, increasing community participation rates and strengthening our economy overall.

Technology and data are the tools we will use to deliver our solutions; however, people will remain at the heart of everything we do. We will be planning and building out the projects for Calgarians using a Human-Centred Design (HCD) and management framework to ensure we are being inclusive and diverse. Our HCD approach will put the end-user at the core of the conversation to ensure solutions are what they need and are delivered with ease of use as a focus.

Calgary is in a unique position in that The City and the University of Calgary have an existing strategic partnership called Urban Alliance. This Alliance enables the seamless transfer of cutting-edge research for the benefit of our community. The Alliance is well positioned to help with the development of technology and coordinate research and data that will be instrumental in achieving our identified outcomes.

The University of Calgary is also currently working on strategic research which is themed on Human Dynamics in a Changing World. This research is investigating how humans adapt to rapid change, with the idea that cities that are smart, safe and secure, and possess a vibrant culture, will prosper and grow because they attract diverse populations looking for desirable places to live and work.

University of Calgary researchers apply their expertise in contexts such as environmental issues, governance, urban design, cyber-security, population and mental health, social dynamics, questions of philosophy and faith, emerging technologies and new media, and fine and performing arts.

We will collaborate with these researchers and other academic institutions as their insights will inform the projects and activities that will be undertaken to support the achievement of our outcomes.

Calgary has the advantage of being able to access vast amounts of data and information from the Calgary Economic Development (CED) authority with measures such as the degree of diversity currently in our economy, and employment statistics for Calgary. CED will also act as the voice for the economic sector in our city, providing feedback and input on the outcomes that were chosen, best practices in implementing technology, identifying stakeholders to engage early in the process and providing 'check ins' as technology is integrated and used.

We will continue to host workshops with our Smart City Community Team of community organizations as we seek to identify players for each project and outcome and create new partnerships in communities. This team has already evolved and as we seek more detailed workplans for the projects, the Community Team may grow and change to ensure we have relevant representation from our diverse population.

We will also use resources in place to engage residents in Calgary in the development of activities and projects to achieve our outcomes such as the Civic Innovation Lab. As we go out into the community, Calgarians will be asked to share ways in which we can implement our projects and activities, share success stories of similar initiatives and provide feedback throughout the process.

We are community.



9
core team
meetings.



QUESTION 6

Preliminary proposal & projects

We are ready for action. We have worked with our community stakeholders to develop a plan of action to achieve our outcome and fulfill the ambitious vision of our challenge statement.

Our planned activities are designed to be open and transparent for our community, as well as other communities who would like to replicate our bold, unique approach to providing connections to our residents, offering increased opportunity to participate in the economy and ultimately lead fulfilling lives.

Foundational elements

Although we will focus on each of the activities and projects individually, they all align and interconnect to strengthen the social and economic fabric of our community. There are foundational elements that support all the projects and deliverables:

- **Open and interoperable** – we will support, promote and leverage open source, open standards and open data to enable collaboration and reuse amongst government, vendors, academia and citizens (eg. crowdsourcing).
- **Scalable and replicable** – we will ensure our projects are delivered with a phased approach to ensure scalability of solutions and to serve as a template for other cities to replicate.
- **Transparent processes** – we will make as many of our engagement, processes and insights as open and public as possible.
- **Predictive analytics** – we will employ predictive analytics to help us make smarter long-term capital investments, make resourcing decisions that align with the technological, economic and social trends and deliver a personalized approach to service in our community.
- **Connectivity infrastructure** – we will commit to working with industry to modernize and accelerate connectivity infrastructure deployment. Both wired and wireless infrastructure serve as a fundamental part of a Smart City. Many actors can participate in the connectivity infrastructure that supports the transportation of data. Industry (private) as well as governments (public) play an integral role in realizing a progressive connectivity ecosystem.
- **Opening Municipal infrastructure** – we will build a public-private model, looking at policies, processes, relationships and procurement, to enable research and rapid commercialization to facilitate innovation, support inclusion and increase diversification of our economy.

Delivering on outcomes

1. Calgarians are connected

Our goal is to bridge the digital divide and build digital literacy to ensure all Calgarians have equal opportunity to access technology and data.

With a population of over 1 million, achieving this outcome for all Calgarians will have to be completed in phases. There is anecdotal evidence from community partners that low-income Calgarians, including our most vulnerable residents have great difficulty accessing the services they need when they need it and often have limited access to technology on a regular basis. This presents an opportunity to focus on this segment of our population while ensuring the solutions developed will scale to all of our citizens.

The activities we will undertake to ensure Calgarians are connected include:

- a. Perform a connectivity gap analysis focused on low-income Calgarians to establish baseline for tools and digital literacy.
- b. The ability to access services quickly can often be done online, but is out of reach if residents don't have the right device to connect with. We will evaluate existing technology-in-hand programs for affordability and assess if a cohesive, affordable technology-in hand-program is required.
- c. The future of cellular and Wi-Fi connectivity is 5G technology. We will develop a public-private model for zones in areas accessible to low-income populations that will also be available for industry and research organizations to test new 5G services and products. Beyond the provision of cellular and Wi-Fi services, 5G is going to play an important role in igniting the digital economy as it has the potential to enable and accelerate new innovations forward such as Industrial Internet of Things (IIoT), field sensors, Autonomous Vehicles (AV) and Connected Vehicles (CV), vehicle entertainment systems, and intelligent traffic systems.

Thousands of small cell antennas need to be deployed for 5G technology to be successful. Opening access to municipal infrastructure with multiple purposes will support the rapid deployment of small cell antennae required for 5G. The development of new standards for light poles and new municipal processes will reduce deployment barriers while still maintaining municipal interests. Integrating these new standards and processes into future municipal planning will ensure Calgary has a sustainable plan long into the future.



Measure

We will measure this outcome in the following ways:

- Defined current state of digital divide for low-income Calgarians
- Increased number of Calgarians that have means to access to internet
- A public-private, 5G-enabled zone model is designed and market-ready
- Successful implementation of 5G-enabled zone that supports access for vulnerable Calgarians along with supporting research and Industrial IoT

Discussions are underway with our Rockefeller 100 Resilient Cities membership to evaluate potential ways to measure the impacts of smart city connectivity and digital infrastructure on economic benefits and to support inclusion for citizens, particularly disadvantaged populations.

As an example, New York City is currently working on a city-based wireless 5G testbed, based in Harlem, with the hope that faster Internet connectivity will create a localized proving ground for next generation innovation and technology applications.



5G plays an important role in igniting the digital economy.

Delivering on outcomes

2. Calgarians have access

Ensuring all Calgarians can access resources they need is fundamental to empowerment.

Our community partners have told us that low-income Calgarians have difficulties accessing the right services for their specific needs at the right time. The process of registering with an agency to obtain services is made that much more difficult without having proper identification. The development of a simple unified process to access services will ensure that this segment of our population is better served. This process can also be scalable to meet the needs of all Calgarians.

The activities we will undertake to ensure Calgarians have access include:

- a. Perform an access-to-service gap analysis for low-income Calgarians to establish a baseline.
- b. Develop a personalized, single-entryway where citizens can enter information relevant to their current situation. This information could then be matched to the many private and government agencies that can offer assistance. There is also potential for this tool to register the individual with each agency.
- c. Build a secure, opt-in citizen biometric-enabled unique identifier leveraging blockchain technology to ensure the secure identification of each citizen using the entryway. Infrared biometrics could be part of this work and would enable the ability to seek individuals with lower than average temperatures (ie. potential opioid overdose) and higher than average temperatures (ie. potential stroke) to get them the help they need when they need it.



Measure

We will measure this outcome in the following ways:

- Defined current state of access to services for low-income Calgarians
- Develop an entryway and:
 - monitor uptake and adoption rate of system for citizens and service providers
 - satisfaction rating of users through survey results
 - increase in Calgarian's awareness of services
 - increased efficiencies for service providers
 - number of services offered through the portal
- Use a blockchain platform to develop a secure identification system

As an example, Austin, Texas is currently launching a program aimed at using blockchain to help keep identities secure for residents experiencing homelessness.



Opt-in citizen biometric-enabled unique identifier leveraging blockchain technology ensures secure identification.

Delivering on outcomes

3. Economic diversification and jobs for Calgarians

Calgarians will have job opportunities and the skills required to have secure employment (through relevant training) which will help diversify our economy.

A smart city approach to this outcome means using data to match Calgarians current skill sets with emerging technologies and new industries where they can utilize skill sets or identify educational/training programs to re-train and adapt to emerging industries. New technology, such as apps or social networking platforms, will also help connect entrepreneurs with funding, bringing big ideas to fruition and supporting investment in our local economy. We will:

a. Perform needs analysis of entrepreneurs/industry to test and try products



b. Implement a living lab strategy and governance model. Municipal assets are pervasive across the municipal footprint and are an important enabler for technology deployment, evolution and integration. The rapid deployment and use of technology in the context of a smart city will depend on a modernized approach between municipalities, industry, academia, and the community. Living labs will require development of new processes, policies and agreements while identifying risks and removing barriers to accelerate progress. Living lab zones will be selected for their strength in supporting vulnerable residents needs first while enabling research, industry investment, and entrepreneurship. Potential living lab zones considered:

- i. Public spaces: areas of the city where people aggregate (eg. downtown) provide an opportunity to bring value to the masses. Field sensors (Industrial IoT), public Wi-Fi, 5G, open data, and mobile applications can be developed and tested.
- ii. Transportation corridors: roads are ideal for testing AV/CV and related technologies such as CV communication infrastructure, 5G wireless street light poles, fibre as a sensor, industrial IoT, etc.
- iii. Land: public and private physical spaces provide opportunity to test and try products and solutions. For example, The City partnered with post-secondary researchers, who are collaborating with NASA and Lockheed Martin, giving access to landfill sites to test digital mapping technology and aerial environmental sensing technology.



Living labs in public spaces provide an opportunity to bring value to the masses.

- c. Deploy a skills transfer/matching tool that facilitates shift to technology jobs. Our goal is to design a tool that assists the currently 70,000 unemployed Calgarians in identifying a job of interest, understand the skills they need for the job and direct them to learning opportunities to acquire the skills they need.
- d. Deploy digital networking tool that matches challenges to research (academia) to solutions (entrepreneurs, industry) to funding (large enterprise and capital). Calgary is incredibly well positioned to match the needs of enterprise with the solutions developed by early stage technology entrepreneurs. The City is one of those large enterprises in Calgary that is able to post 'challenges' and test solutions. In this scenario, The City benefits through the creative solutions tailor built for their needs and the start-up community benefits by having a large enterprise test their technology providing validation and facilitating the commercialization of their technology.



Measure

We will measure this outcome in the following ways:

- Defined current state of industry needs for living labs
- Adoption rate of living lab participation
- Increase the number of new businesses or products to market
- Number of open technology job postings
- Number of successful technology companies
- Non-oil/gas industries grow from 68% to 72%

We roll up our sleeves.





QUESTION 7

Community strategy alignment

The City's vision is "Calgary: a great place to make a living, a great place to make a life."

Our diverse skills and heritage interweave to create a resilient communal fabric, while our collective spirit generates opportunity, prosperity and choice for all of us.

Our existing Council Directives (2019-2022) are born from our residents' input and provide a shared vision and priorities for our community:

- **A Prosperous City**
Calgary continues to grow as a magnet for talent, a place where there is opportunity for all, and strives to be the best place in Canada to start and grow a business.
- **A City of Safe and Inspiring Neighbourhoods**
Every Calgarian lives in a safe, mixed and inclusive neighbourhood, and has the right and opportunity to participate in civic life. All neighbourhoods are desirable with equitable public investments.

Enough for All Strategy

The Calgary Poverty Reduction Initiative is working to implement a strategy to reduce poverty and vulnerability in the short term, and end it long term. The vision is a community where no human being is deprived of the resources, means, choices and power to acquire and maintain self sufficiency while being able to be an active participant in society. The goals are: all communities are strong/supportive/inclusive; everyone has the income/assets needed to thrive; everyone can easily access the right supports/services/resources; and all Aboriginal people are equal participants in Calgary's prosperous future.

2020 Sustainability Direction

The 2020 Sustainability Direction⁶ aims to ensure Calgary is a vibrant, safe, healthy and socially inclusive city, that we are resilient, complete and connected, and have programs, services and amenities that are accessible, affordable and high quality. It outlines our desire for a prosperous economy with Calgary as the undisputed choice for people and business, fostering opportunity for all to achieve individual economic well-being.

Economic Strategy for Calgary

After two decades of leading economic growth in Canada, Calgary is at a crossroads with changes in the global economy and we are updating our economic strategy. The vision is to make Calgary the city of choice for entrepreneurs innovating solutions for the world's greatest needs such as food, health, energy and transportation. The City has established a \$100 million funding program to support new high-quality business investments for our city. The target areas focus on talent, innovation, place and business environment.

Imagine Calgary

Our community's 100-year plan focuses on a city where we are each connected to one another, our places and our communities. Whether social, cultural or physical, these communities are mixed, safe and just. They welcome meaningful participation from everyone, and people move freely between them. Our talent and caring, combined with a truly Canadian sense of citizenship, make positive change across Alberta, throughout Canada and around the world.

Our identified outcomes and activities complement our community's existing medium and long-term plans.

We are aligned.

⁶ <http://www.calgary.ca/PDA/pd/Documents/municipal-development-plan/2020-sustainability-direction.pdf>



QUESTION 8

Community readiness & ability to implement

Our community is no stranger to complex projects and has the talent, resources, ability and drive to make great things happen when we work together as a community.

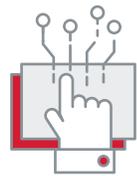
We're ready to dig in.

We have invested in infrastructure.

Calgary has considerable infrastructure to accelerate our smart city initiatives and we aim to use them. We can build upon our multiple data centres (strengthening resilience), 450 Km of open-access fibre optic cable, MPLS transport network, 8 wireless towers, city-wide LoRaWan network for IoT, fixed wireless networks and public Wi-Fi networks through a public-private partnership model.

We have a Civic Innovation YYC team.

Civic Innovation YYC is an incubator and accelerator aimed at building creative collision space between The City and the community. This includes tools such as an online platform to gather ideas and a civic innovation lab where City employees and residents come together to innovate.



450 KM
of open-access
fibre optic cable.

We have living labs.

Calgary's living labs support companies, researchers, and developers to work directly with the community utilizing City infrastructure to further product development, program applications, product testing and integration in a real-world setting. To date, these opportunities have resulted in world-class research for water treatment, quantum computing and fibre-as-a-sensor.

We are experienced in complex project management.

The City's Project Management Centre has a proven track record of implementing innovative solutions spanning multiple business lines and service areas with our community and partners. It follows project management industry standards to develop and sustain corporate excellence in project management.

We are data/analytics-driven.

We are data/analytics-driven.

Data is collected and shared across our community and there is a movement to take data usage to a new level. This includes Data for Good Calgary and researchers at the University of Calgary who have created the YYC Data Collective – a data sharing initiative bringing together Calgary's non-profit organizations, charities, community organizations and civil society groups.

AnalyticsCalgary is a City corporate initiative that increases collaboration and breaks down silos to maximize the efficiency and utilization of data for decision-making. Using advanced **analytics**, stories are defined behind the data which helps identify customer behaviors to enhance actions and strategies to make lives better for Calgarians.

The City's **Open Data** practice ensures data is truly accessible, usable and barrier-free to both internal employees and citizens. It is ranked 4th in Canada on the Open Cities Index and the Open Data Portal is available to both internal employees and the public.

The City has problem-solvers, analysts and specialists to help realize the value of **location-based data**, geospatial technology and analytical tools to integrate geospatial solutions and data for our solutions.



4TH
in Canada on the
Open Cities Index.

We are better together.

The City and University of Calgary have an established relationship bringing civic administrators and world-class researchers together through the **Urban Alliance** to identify researchers, technology, data and infrastructure for unique initiatives in municipal innovation, research and education. A recent collaboration enabled quantum scientists to teleport a photon state over the municipally-owned dark fibre optic system. The University of Calgary is also formalizing the creation of Smart Cities Partnership YYC with the goal of building a global network for comparative research on smart cities, including open data.

The City aims to formalize a **Civic Accelerator** framework as an alternative approach to supplying The City with solutions in partnership with industry. This helps fill the commercialization gap – by working with early stage businesses to co-create solutions for civic challenges with government and partners.

Calgary's **Internet Exchange** is a place where networks meet, interconnect and move vast amounts of information and data between networks quickly without an exchange of money. The benefits of having an IX in our communities can include improved internet experience, encouraging competition, lower prices, enhanced security because traffic stays local and attracting large tech companies and content providers.



Rainforest Alberta is an active and rapidly growing private-sector collaborative with 1400 members focused on diversifying the city and province's economy. It has already realized significant growth in the quality of Calgary's vibrant innovation ecosystem. It is a group of passionate, diversified, purpose-driven residents from investors and entrepreneurs to technology specialists and educators and more. The scope spans all fields such as housing, agriculture, poverty, indigenous, city life, homelessness, arts and culture – just to name a few. Initial discussions with large and small private equity firms have shown interest in matching the Smart Cities Challenge funds.

Calgary's new **Platform Innovation Centre** is set to open Fall 2020 and will be a multi-use space for learners, projects, makers and community - used to help move the city's best minds and ideas forward, turning concepts into entrepreneurial opportunities and scale local businesses into international success stories.



1400

**Rainforest Alberta
members focused on
diversifying the city and
province's economy.**

We mind the gaps.

We have anticipated areas we need to strengthen and opportunities to harness this challenge:

- Smart projects deployed individually – an opportunity to deliver smart solutions holistically, identify collaboration opportunities, build out common foundations.
- Resource constraints – ability to work in small groups, be nimble, build partnerships, foster innovation.
- Economic downturn – rising entrepreneurial spirit, new ways of doing things.
- Calgary not known for technology sector – baked into economic strategy, market accomplishments and vision.

The City has a well-established procurement process and has explored several avenues to meet our smart city objectives. The City offers leading-edge procurement practices while ensuring fair, open and transparent processes are observed and is Canada's first municipality to move fully online and only accept electronic bids.

Consultant onboarding and acquisition of technology and services is likewise planned in a transparent manner employing negotiable RfX documents.

To keep pace with emerging technologies, we are in the process of finalizing a Market-Led Proposal process in alignment with policy and trade agreements. This allows any vendor to submit its product/service to The City and allows us to manage unsolicited proposals while learning about new technologies and innovative solutions.

Where required, we will bring in consultants, specialists and partners to provide support to our team.

We have the commitment of our Council and many community partners in ensuring our Smart Cities activities and projects are a priority.

We've got this.





QUESTION 9

Use of \$250,000 grant

With the assumption of a four-month period between finalist announcement and final submission entry, Calgary will reconvene our Smart City teams, bring in subject matter experts and further build out assessments of the identified projects and activities.

The City already follows corporate project management standards which can be leveraged to develop a program plan and prepare procurement strategies should our community win.

To ensure maximum effectiveness of the grant, The City will accommodate the internal team within existing operating budgets. The grant will be used to fund external resources to accelerate data gathering, analysis, documentation and continued community engagement. The knowledge gathered will be shared amongst City teams and community partners to ensure continued benefits to Calgary.

We project the grant will be used within these spending categories:

• **Building capacity - \$50,000**

- Consultants for the Human-centred Design framework proposed and anticipate knowledge-transfer to our teams. Barriers to accessing technology and information for Calgarians will be explored with a human-focused approach and would include community meetings and focus groups with citizens to understand their needs and identify appropriate data and technology solutions.

• **Feasibility assessments - \$150,000**

- To bridge the digital divide and build digital literacy, consultants will be used to review community stakeholder information, gather stakeholder requirements, and develop a procurement strategy to deliver the Connectivity for Low-Income Calgarians and the Access to Services for Low-Income gap analyses along with the Technology-in-Hand Opportunity report.
- Many of the projects and activities will use leading-edge technologies where our teams may require expertise and knowledge. Consultants and industry experts will be convened to gather information and requirements to define and document the living lab, 5G-enabled zones, and Industrial Internet of Things (IIoT) with associated procurement strategies.

- Some of the identified tools and solutions identified may exist but don't fully meet the required end-state. Consultants will review existing stakeholder tools and portal services, gather stakeholder requirements and develop procurement strategies.
- Consultants and industry experts will be convened to gather information and requirements to define the use of blockchain and biometric enabled unique identifier.

• **Community engagement - \$50,000**

- Stakeholder workshops and continued community engagement will be performed to identify potential new partnerships for the identified projects and activities.
- Resources will be used to manage future public engagement and to provide information and updates to keep Calgarians informed of progress.

There is a potential opportunity to leverage our participation with the 100 Resilient Cities program to conduct research to better understand the economic and social impact of digital infrastructure solutions to support the economic participation and social inclusion of disadvantaged citizens.

Other potential funding mechanisms and procurement avenues such as public-private partnerships and sponsorships will be investigated to bolster resource requirements. We anticipate the potential for in-kind support from key stakeholders, academia, not-for-profits, the private sector and others as we all work to creating an even better Calgary.

We are stronger together.



QUESTION 10

Partners, process to select

The City has engaged multiple stakeholders through the development of our Challenge Statement and in identifying projects and activities to achieve our outcomes.

Our key partners to date include:

- **Calgary Economic Development Ltd. (CED)** will help us by providing baseline data and measuring successes related to economic diversification. CED works with business, government and community partners to position Calgary as the location of choice for the purpose of attracting business investment, fostering trade and growing Calgary's workforce.
- The **Urban Alliance**, a research partnership between The City and **University of Calgary**, will provide access to world class researchers, highly qualified personnel and technology and data required to implement our projects and activities.
- **United Way of Calgary and Area** will provide insight into the needs of our community's underserved populations. The United Way is a partner in 211 Calgary, a referral and information service offered through partnership between United Way, The City and **Distress Centre Calgary**. The United Way is also a community leader in our city that will help in identifying key players and stakeholders for activities and projects.
- The **Calgary Drop-In Centre** and **Calgary Homeless Foundation** are community-based organizations responsible for the coordination and delivery of services to individuals experiencing homelessness in our city. These two organizations will provide data and information for vulnerable citizens, barriers to accessing services and provide insight into engagement opportunities for participation in the workforce.
- The **Calgary Foundation**, a community leader in Calgary's non-profit community. They are pivotal in engaging citizens in our community through a wide range of tactics, including the Vital Signs Survey.

Further, our Smart City Community Team is made up of the following leading community-based organizations that provided input to our challenge statement and activities/outcomes workshops:

- Alberta Centre for Advanced Micro/Nano Technology Products
- Alberta Economic Development & Trade
- Attainable Homes
- Calgary Chamber of Commerce
- Calgary Drop-In & Rehab Centre
- Calgary Economic Development
- Calgary Homeless Foundation
- Calgary Parking Authority
- Calgary Public Library
- Calgary Technologies Inc.
- Cybera
- Distress Centre Calgary (211)
- ENMAX
- Rainforest Alberta
- United Way
- University of Calgary

The City has adopted an Indigenous Policy⁷ and as a city we are committed to engagement processes and opportunities with Indigenous communities, leadership, and organizations. The Calgary Aboriginal Urban Affairs Committee is a collaborative effort between The City and the Indigenous community to address and resolve issues pertaining to urban Aboriginal residents. We will continue to engage our urban Indigenous population through this collective.

Where partners are not identified, we will rely on our community network to identify key stakeholders that would be beneficial to include in implementing projects and activities. This will be accomplished through focus groups with our key stakeholders and workshops with new partners to identify their strengths and what they will be able to contribute to our overall outcomes.

We are partners.

⁷ http://www.calgary.ca/_layouts/cocis/DirectDownload.aspx?target=http%3a%2f%2fwww.calgary.ca%2fCA%2fcity-clerks%2fDocuments%2fCouncil-policy-library%2fCP2017-02-Indigenous-Policy.pdf&noredirect=1&sf=1

QUESTION 11

Confidential annex

To align with our open and transparent goals for our smart city submission, there is no confidential information for this proposal.

QUESTION 12

Summary of preliminary proposal

Calgary is at a transformational period in its history. We are working to create shared social and economic prosperity for our citizens, providing opportunities for people to empower themselves and increase access to our economy through employment and education. We are a community that cares, and in collaboration with our community partners, we will work to ensure that all Calgarians have equal opportunity to access information and services and are connected to the tools they need to fully participate in our community. Having engaged residents creates a vibrant community, one where individuals are able to live their best life.

Our human-centered design approach puts Calgarians at the core of the conversation to ensure solutions are matched to their needs.

Through increased connectivity, open and transparent access to information and services and more opportunity for economic participation, we will ensure that Calgarians have the opportunity to make an affordable living and lead fulfilling lives.

The Calgary community is committed and ready to take our smart city agenda to the next level.

The future is here and Calgary is ready.

QUESTION 13

Link

Calgary's full submission, supporting documentation and community letters of support can be found at www.calgary.ca/smartcity.

QUESTION 14

Evidence of commitment

Letter of Support from Mayor Nenshi and Jeff Fielding, Council Resolution



Naheed K. Nenshi, Mayor

April 24, 2018

To the Honourable *Amarjeet* Sohi, Minister of Infrastructure and Communities (& Jury Members):

On behalf of Calgary City Council and the citizens we represent, I want to share my support for Calgary's submission to Canada's first-ever Smart Cities Challenge.

This challenge comes at a pivotal time in our history. Infrastructure Canada's leadership to bring the smart cities agenda to the forefront helps communities across the country leverage data and technology to achieve meaningful outcomes for the citizens we serve. This challenge also helps us draw from our collective inventiveness while we connect with each other to accelerate smart solutions. This has the potential to move us towards a vision of shared prosperity faster than we could if we were tackling these challenges on our own. Bottom line: The future is here and we're ready for it.

As mayor, I've had the privilege of representing Calgary and promoting our city across the country and around the world to businesses and investors. I'm excited to see the amazing community support, leadership, and innovative thinking at our community table during this preliminary proposal phase.

This process has been about the power of people to make change in our communities. Citizens, academics, business leaders, entrepreneurs, and many of my colleagues at The City of Calgary have really collaborated to create an admirable submission that is focused on empowerment, inclusion, and economic opportunities for Calgarians in a truly transformative way.

Calgary is in the midst of a fragile economic recovery. We are working incredibly hard to create a better and more resilient economy for all. As we do this, we are also creating deeper relationships with community partners to foster entrepreneurship and create the right environment to commercialize research.

Supporting growth, diversification, and innovation are priorities in our community, and I think Calgary's Smart Cities Challenge proposal hits right at the heart of what our community needs now. It also identifies some impressive, pioneering projects that we can get behind to achieve real, significant outcomes for Calgarians, and that can be modelled by communities across Canada.

The case for Calgary is strong. We have the talent and desire to make great things happen. Calgary is a place where creativity can thrive. My colleagues on Council and I have supported the leadership and progress The City has achieved so far to advance the smart cities approach in our community, and we will continue to champion the use of data and technology to improve the lives of Calgarians every day.

Sincerely,

Naheed K. Nenshi
MAYOR

CITY MANAGER'S OFFICE

24 April 2018

To the Honourable Amarjeet Sohi, Minister of Infrastructure and Communities (& Jury Members)

On behalf of The City of Calgary, I am excited to place my full support behind Calgary's community submission to Canada's first-ever Smart Cities Challenge.

I appreciate the unique opportunity that Infrastructure Canada is presenting to our community through this ambitious challenge. Our Smart Cities team has leveraged the different parts of our community, from academia and social service agencies, to business and citizens, to envision transformative and forward-thinking ideas that have the potential to achieve positive tangible outcomes for Calgarians.

The need for economic and social resiliency has been identified as a priority in our community. Calgary has created an exemplary submission focused on economic opportunities, as well as empowerment and inclusion for our citizens. Our ambitious outcomes will ensure that every person in our community is connected and has access to the services, supports, information and diverse job opportunities. Now we are eager to bring these ideas and plans to life.

I am confident that Calgary is ready to take on this challenge. In my role as City Manager, I have seen how my colleagues at The City of Calgary have already been using smart city approaches to help make life better every day for citizens. For many years, we have been delivering smart services and investing in smart infrastructure to address citizens' needs. A few examples include our fibre optic infrastructure, smart fleet, intelligent intersections, and a civic innovation lab.

We also know that in order to have real impact, we need to work together. The City of Calgary is a member of the Alberta Smart City Alliance – a cross-provincial body that brings together government, academia and industry bodies to collaborate and move the smart city agenda forward on a world scale.

The City of Calgary is committed to the outcomes, projects and ideas that have been brought forth through the preliminary phase of this challenge. We are already engaging community partners who have the expertise and energy to propel us forward, and will leverage our infrastructure and resources to bring these ideas to fruition.

I am proud and fully supportive of the proposal that Calgary's Smart Cities team has submitted. It is ambitious in scope, compassionate by design, and its solutions can help position any community to be more resilient in an ever changing future. I look forward to following the progress of the Smart Cities Challenge.

Sincerely,



Jeff Fielding
City Manager
The City of Calgary | Mail Code #8003
T 403-268-2109 F 403-537-3027
E Jeff.Fielding@calgary.ca

QUESTION 15

Contact

- Name: Monique Nessel
- Title and affiliation:
Smart City Lead, The City of Calgary
- Phone number: (403) 667-9990
- Email address: Monique.Nessel@calgary.ca

QUESTION 16

Privacy

The City of Calgary agrees to and accepts all program requirements.

QUESTION 17

Organization information

2017 full-time equivalents (FTEs):

- Number of total FTEs – 15,790
- Percentage of total FTEs devoted to innovation – 10% estimate

2017 operating and capital budgets:

- Total operating budget - \$3,158,797,079
- Percentage of total operating budget devoted to innovation – 10% estimate
- Total capital budget - \$1,977,541,405
- Percentage of total capital budget devoted to innovation – 10% estimate

QUESTION 18

Focus areas

- Economic opportunity: residents are supported by a thriving local economy.
- Empowerment and inclusion: residents are supported and given the opportunity to participate in the community.

QUESTION 19

Community system/ service areas

- Economic development
- Education and training
- Emergency services and enforcement
- Land use planning and development
- Public health
- Recreation and parks
- Roads and transportation
- Social services

QUESTION 20

Technologies considered

- Artificial intelligence (AI)
- Augmented reality (AR) or Virtual reality (VR)
- Autonomous and connected vehicles
- Big data analytics
- Cloud computing
- Geospatial
- Health or Medical technology
- Internet of Things (IoT)
- Mobile applications
- Networks
- Open data platforms
- Sensors
- Other: blockchain, infrared biometrics; living labs, 5G, machine learning, sensor networks

