



Region of Waterloo



**Smart Cities Application**  
**Healthy Children and Youth**

# Smart Cities Application

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## Question 1

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

If this application is being submitted by a group of communities, add each community separately using the button. If this application is being submitted by a regional entity, please include the name of the regional entity with each individual community (e.g. City of Dunn/Smith Region). Do not include the regional entity as a separate, stand-alone community.

Community (City of Cambridge/Waterloo Region)  
Name of community City of Cambridge/Waterloo Region  
Province or Territory Ontario  
Population based on 129,920  
Indigenous community No

Community (City of Waterloo/Waterloo Region)  
Name of community City of Waterloo/Waterloo Region  
Province or Territory Ontario  
Population based on 104,986  
Indigenous community No

Community (City of Kitchener/Waterloo Region)  
Name of community City of Kitchener/Waterloo Region  
Province or Territory Ontario  
Population based on 233,222  
Indigenous community No

Community (Township of Wellesley/Waterloo Region)  
Name of community Township of Wellesley/Waterloo Region  
Province or Territory Ontario  
Population based on 11,260  
Indigenous community No

Community (Township of Wilmot/Waterloo Region)

Name of community Township of Wilmot/Waterloo Region  
Province or Territory Ontario  
Population based on 20,545  
Indigenous community No

Community (Township of Woolwich/Waterloo Region)  
Name of community Township of Woolwich/Waterloo Region  
Province or Territory Ontario  
Population based on 25,006  
Indigenous community No

Community (Township of North Dumfries/Waterloo Region)  
Name of community Township of North Dumfries/Waterloo Region  
Province or Territory Ontario  
Population based on 10,215  
Indigenous community No

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## 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)

Our selected prize category is \$50 million.

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## Question 3 (50 words)

**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.**

We will become the benchmark community in Canada for child and youth wellbeing by using early intervention, youth engagement and a connected-community framework to

create adaptive, data-driven programs and scalable learning technologies that improve early child development, mental health and high school graduation rates.

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## Question 4 (2,500 words)

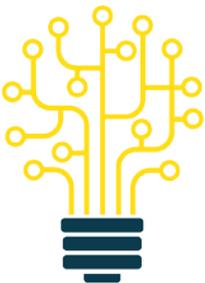
**Please describe the outcome (or outcomes) your proposal seeks to achieve by elaborating on your Challenge Statement.**

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).

Over the next 10 years, Waterloo Region will become the benchmark community in Canada for child and youth wellbeing. By benchmark, we refer to becoming the community in Canada with the highest child and youth wellbeing, as measured against UNICEF Canada's Child and Youth Wellbeing Index, where other communities strive to achieve our level of child and youth wellbeing.

Based on extensive data collection and public engagement, we have identified six priority areas affecting child and youth wellbeing in Waterloo Region: early child development, literacy, mental health, bullying, sense of belonging, and high school graduation rates. To achieve our goal of becoming the benchmark community in Canada for child and youth wellbeing, we will create adaptive, data-driven programs and scalable learning technologies to become one of the top rated communities in the country for each identified priority area.



In Phase 2 we will establish specific targets and goals in each identified priority area based on UNICEF Canada's Child and Youth Wellbeing Index.

## **Wellbeing in Waterloo Region**

Over the last two years, our community has been engaged in an initiative ([Wellbeing Waterloo Region](#)) to identify and address collective priorities that will improve community wellbeing so that everyone in our community can thrive. Through this initiative, partners are working together in new and different ways. Based on quantitative data and extensive community input in 2017, Wellbeing Waterloo Region identified three priority areas for collective action: affordable housing, social inclusion, and healthy children and youth.

These three priority areas were used as a starting point for further community consultation to inform our Smart Cities application. After extensive consultation, healthy children and youth was selected as our community focus for our application.

## **Wellbeing of Children and Youth in Waterloo Region**

In Waterloo Region we have adopted the Canadian Index of Wellbeing's definition of wellbeing:

“The presence of the highest possible quality of life in its full breadth of expression focused on but not necessarily exclusive to good living standards, robust health, a sustainable environment, vital communities, an educated populace, balanced time use, high levels of democratic participation, and access to and participation in leisure and culture.”

The Waterloo Region Children and Youth Planning Table is a community-wide partnership of approximately 70 organizations including service providers, researchers, planning bodies and funders serving children and youth, prenatal to 18-ish, and their families. Using “18-ish” to define the transition from youth to adult is intentional. 18 years of age is a key milestone in an individual's life as they transition from secondary school to higher education or employment. We use the term “18-ish” however, in recognition that some youth will exit the school system prior to age 18, while others remain in secondary school well past their 18th birthday. We want to ensure our work is inclusive of those community members as well. The Children and Youth Planning Table has developed the following definition for child and youth wellbeing:

All children and youth feel valued, heard and included, are safe and supported by caring adults, are physically and emotionally healthy, are lifelong learners and can see a positive future for themselves.

Through this definition, the Children and Youth Planning Table has been working to further understand and measure each component of wellbeing for children and youth. This proposal leverages the collective knowledge of the Children and Youth Planning Table to identify the system-level indicators to help our community measure how well children and youth are faring across all dimensions of child and youth wellbeing. In looking at the local data picture, informed by national and community level input (including youth), and drawing on the expertise of the Children and Youth Planning Table, we have identified community-wide wellbeing challenges faced by our children and youth.



Of those challenges, through the extensive research and consultations described above, we have narrowed in on six priority focus areas. These six areas were brought forward as the areas of greatest urgency or need in our community. They also have the support or a level of community readiness to address. Therefore, the outcome of becoming the benchmark community in Canada for child and youth wellbeing will be achieved by improving six inter-related indicators of wellbeing:

1. Early childhood development;
2. Literacy;
3. Mental or emotional health;
4. Sense of belonging;
5. Bullying; and,
6. High school graduation rates.

## **Indicators and Community Need**

### ***Early childhood development***

The early years from conception to age six have the most important influence of any time in the life cycle on brain development and subsequent learning, behaviour and health. Children develop at an astonishing rate in the early years. They are impacted by early experiences and relationships that help guide healthy cognitive, emotional, and social development. Investing in the early years has a direct impact on economic, social, and health outcomes for both individuals and society.

One measure of early childhood development is the Early Development Instrument (EDI). The EDI is a questionnaire completed by teachers of kindergarten students,

designed to "assess the developmental health (skills and behaviour) of children at the age of developmental transition from early development to school age in a holistic manner." The EDI measures children's ability to meet age-appropriate developmental expectations in five domains: physical health and well-being; social competence; emotional maturity; language and cognitive development; and communication skills and general knowledge.

In 2015, more children in Waterloo Region scored low on three of the five domains – physical health and wellbeing, social competence and emotional maturity – than in 2010. Across all five domains, more children from Waterloo Region were scoring low compared to Ontario. Further to this, more children were identified as being vulnerable (scoring low on two or more domains) in 2015 compared to 2010, 18.5% and 15.7% respectively. These are concerning trends that would greatly benefit from the measures and solutions identified in this proposal.

### ***Literacy***

Literacy is strongly connected to wellbeing; Health Canada identifies literacy as a major determinant of health. Children who read or are read to are more prepared for learning when they enter school, have stronger language and social-emotional skills throughout their childhoods, and reap the benefits of these early skills throughout their lives. Research has established a strong connection between literacy and economic security and wellbeing. Canadians with weaker literacy skills are more likely to be unemployed, work in lower-paying jobs and live in low-income households.

In Waterloo Region, and across Ontario, successful completion of the Ontario Secondary School Literacy Test (OSSLT) is required to graduate from high school. For students from the Waterloo Region District School Board and the Waterloo Catholic District School Board, the percentage of first time eligible students who were successful on the OSSLT has remained relatively consistent from 2013 to 2017, between 82.0% and 83.0%. This lower than ideal rate is consistent with the provincial rate. In 2014-2015, 82% of fully participating students across Ontario were successful on the OSSLT.

### ***Mental or emotional health***

Our goal is that all children and youth in Waterloo Region are emotionally healthy. This includes possessing effective coping and problem-solving skills to navigate life challenges, being supported in their mental health, having a strong sense of self-worth and identity, and engaging in healthy relationships with peers. Children and youth with good emotional health can understand and manage their emotions and the emotions of

others. This contributes to building healthy relationships and the ability to cope with challenges.

Approximately 20% of youth aged 12 to 18 in Waterloo Region self-reported poor mental health. Youth in Waterloo Region have shared through community conversations that they are stressed and experience challenges related to their mental health.

More alarming, the rate of reported emergency room visits for self-harmed youth, aged 10 to 18, is higher in Waterloo Region than the province as a whole, 485.4 and 328.1 per 100,000 respectively. Waterloo Region has a similar suicide mortality rate to the province, 4.3 and 3.3 per 100,000 deaths respectively. Over a 5-year period in 2008 to 2012, 13 youth aged 10 to 18 died by suicide in Waterloo Region.

### ***Sense of belonging***

Feeling valued, heard and included, including feeling welcomed, having a sense of belonging, and feeling that children and youth are valued members of the community is an important component of mental health and overall wellbeing.

All children and youth should feel like they are a part of their community.

Feeling a social and environmental connection gives children and youth a sense of stability, helping them deal with challenges and uncertainty.

Those with a strong sense of belonging are more likely to have social networks and be engaged in their community.

In 2013-2014, 78.6% of local youth reported having a very strong or somewhat strong sense of belonging to their local community, slightly lower than youth across Ontario.



### ***Bullying***

Bullying comes in many forms and can include emotional and psychological as well as physical violence. Bullying is linked to poor health, low self-esteem, poorer educational outcomes, depression and thoughts of suicide. Canada has the fifth-highest rate of reported bullying compared to 41 rich countries, at 15%. Currently, bullying is reported at the Local Health Integration Network (LHIN) level. The local data encompasses the Waterloo Wellbeing LHIN (Waterloo Region, Wellington County, the City of Guelph and the southern part of Grey County). In 2015, 25.9% of Waterloo Wellington LHIN secondary school students reported being a victim of bullying at school, and 15.9% said they had been a victim of cyber-bullying. From a recent focus group of rural youth in our community, youth felt that overall bullying is on the rise and that bullying has negative implications on their mental health. Cyber-bullying was specially referenced; youth feel that cyber-bullying is more common with the increase in social media use.

### ***High school graduation***

Learning opportunities give children and youth the space to develop a variety of skills and abilities. Children and youth who are lifelong learners are self-motivated and curious, they want to try new things and build the knowledge and skills to succeed in the future. Experiencing success in school is an important component of lifelong learning and overall wellbeing for children and youth. Health and living standards, in particular, are positively influenced by educational attainment - higher levels of education and income allow greater access to safe and healthy living conditions and other resources. One way to measure success in school is high school completion or graduation, specifically five-year graduation rates.

According to the Canadian Index of Wellbeing, while high school graduation rates have increased over the last six years in Waterloo Region, the 82.2% completion rate in 2016 was the lowest in the areas making up Central Ontario (91.0%) and among the lowest in the entire province (86.5%).

### **Rational for Smart Cities Challenge Focus Area**

During our Smart Cities consultation process, we sought community input to help develop key principles to select our challenge area. “Smart Waterloo Region Principles” were generated as a result of extensive engagement over the months of January to March, 2018. Through this engagement, it was determined that the challenge area selected and smart city solution must align with the following principles:

- Start with people’s needs and engage the community;
- Share data but protect privacy and personal information;
- Build connections and work together;
- Build on existing technologies but reflect local context;
- Respond faster and make it transferable; and,
- Measure outcomes and design for the future.

In weighing all three potential challenge area against these principles, healthy children and youth best aligns with these community generated criteria.

Though technology solutions are crucial components of our smart cities approach, our community felt that priority should be given to the challenge area that will have the greatest reach and impact over time. Rather than giving priority to a challenge area with the most technology solutions available, our approach is viewing technology solutions as enabling tools to improve child and youth wellbeing. Out of the three potential options, healthy children and youth has the greatest potential benefit over time.

Feedback from our Smart Waterloo Region online survey and stakeholder roundtables helped to narrow our focus as well. We received many creative solutions to potentially address affordable housing, social inclusion and healthy children and youth; however, respondents provided the most technology-based and data-driven solutions for healthy children and youth. This feedback provided additional justification for selecting healthy children and youth. After receiving this feedback, our community has decided to ensure that our smart city solution for healthy children and youth is used to also address challenges faced in the areas of social inclusion and affordable housing.

Having selected our challenge area, we engaged the Waterloo Region tech sector to assess what locally generated technology and data solutions exist in our community. Through a comprehensive outreach process, we discovered that there are a wide variety of local technology solutions available to address child and youth wellbeing, defined above.

The rationale for selecting healthy children and youth is that it is the best fit weighed against the Smart Waterloo Region Principles, as informed by community input. It is also the challenge area with the greatest reach and long-term impact, and has the most perceived and realized technology solutions.

## **Measuring Progress**

Our community is measuring and monitoring our wellbeing using the Canadian Index of Wellbeing and, for children and youth, through the Children and Youth Planning Table's Shared Measurement Framework. The Children and Youth Planning Table's Shared Measurement Framework uses 32 system-wide, locally available indicators related to child and youth wellbeing in Waterloo Region and is well aligned with UNICEF Canada's upcoming Canadian Index for Child and Youth Wellbeing. Through our partnership with UNICEF Canada, we will adopt their entire Canadian Index for Child and Youth Wellbeing to have a fulsome understanding of child and youth wellbeing in our community.

The data used in much of our work to this point has been region-wide averages. Unfortunately, averages often hide the most disadvantaged and excluded. A significant focus will be made to fill data gaps and to disaggregate data where possible, making all children and youth in our community visible. This will be supported by our new community-based data platform (see Question 6).

In Phase 2 we will establish specific targets and goals in each identified priority area based on UNICEF Canada's Child and Youth Wellbeing Index.

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## Question 5 (1,500 words)

**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.**

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.

### Community Engagement

Our approach to the Smart Cities Challenge has been informed by considerable public consultation and stakeholder outreach through the Wellbeing Waterloo Region (WWR) initiative, described above. Through over 40 community engagement activities in 2017, more than 3,600 members of the community, community leaders, youth, and service providers shared what is needed in Waterloo Region to achieve wellbeing. Based on this extensive engagement and data collection completed over the last year, WWR combined both qualitative feedback and quantitative data to determine trends and challenge areas facing our community. Three priority areas were established as a result: affordable housing, healthy children and youth and social inclusion.

With the launch of the Smart Cities Challenge, using the comprehensive data gathered by WWR, we came together as a community to structure our collaborative approach. Waterloo Region's smart city response was led by the Region of Waterloo and seven area municipalities (Cities of Kitchener, Waterloo, Cambridge, and Townships of Wilmot, Woolwich, Wellesley and North Dumfries). A Steering Committee of the eight municipal Chief Administrative Officers was established to provide direction on community engagement and



application development. An Advisory Committee was created to advise the Steering Committee with representation from local post-secondary institutions, tech and data accelerator centres, the private sector, and a cross-section of local not-for-profit organizations. This structure ensured comprehensive consultation and representation from different segments of our community.

From January to March of 2018, we worked intensively with our community through a wide variety of engagement opportunities. We hosted a Smart Waterloo Region online survey and ran promotions to support our smart cities initiative on the Region of Waterloo and area municipalities' social media channels, local media, and through our community partners' networks. Our online survey and social media impressions, which helped to raise awareness of our initiative, received a high response rate from our community. Also, we hosted four public consultations in Woolwich, Cambridge, Kitchener and Waterloo, and engaged younger adults at Conestoga College's Smart Cities Hackathon event. Two targeted engagement events for thought leaders in the private, tech, not-for-profit and education sectors were well attended by more than 150 participants. Through this engagement, healthy children and youth emerged as the challenge area of focus.

Overall, 65% of survey and consultation participants felt that our community is not placing the wellbeing of children and youth first, and that we need to make collective investments in our children and youth today to better support generations to come.

After selecting healthy children and youth as our challenge area, we further engaged our tech community to assess what smart technology and data framework solutions existed locally. As a result, we met with over 20 tech companies, data specialists and researchers to establish positive relationships, new partnerships and to help develop the data framework that will breakdown silos within our community.

As a community, consultations revealed that there is a collective desire to do more to ensure children and youth can thrive. Feedback received to improve child and youth wellbeing incorporated many technology based solutions, such as:

- Broader education platforms that support lifelong learning (integration of learning technologies in and outside of the classroom, community mentors, co-op and volunteering platforms to further educate youth, etc.);
- Technology in youth programming that supports children and youth feeling valued, heard and included (inclusive, innovative, adaptive, data-driven programs, etc.);
- Connected community spaces that provide access to technology and support youth being able to see a positive future for themselves

(development of programming in science, technology, engineering, arts, and mathematics (STEAM));

- Use of technology to support mental and physical health; and,
- Better use of data and technology to enhance programs and policies around food security, nutrition, and youth mobility.

## **Challenge Statement Development**

Addressing a social issue is impossible to do in isolation. We used the Smart Waterloo Region principles (referenced in Question 4) and feedback generated from our community engagement efforts to create a statement to best reflect the desires of our community with interdependent solutions, including: a connected-community framework, data-driven programs and scalable learning technologies to improve early child development, mental health and high school graduation rates.

Additional research with our community partners through the Children and Youth Planning Table of Waterloo Region, local school boards, and post-secondary institutions further emphasized the importance of child and youth wellbeing as it relates to not only youth development but also economic opportunity, youth empowerment and inclusion and the long-term sustainability of a community.

Based on the feedback received, our community identified early and preventative intervention, engagement and collaboration as key to addressing child and youth wellbeing. All of these factors were considered when drafting our challenge statement. By leveraging local technology solutions, meaningfully engaging local children and youth, and using an integrated community approach, we will become the benchmark community for child and youth wellbeing in Canada.

## **Inclusive Outreach**

Importance was placed on inclusive outreach to focused populations at different stages of the engagement process. Beginning with the outreach done by the WWR initiative, a concerted effort was made to reach groups that may not typically participate in public input processes. Before the identification of WWR's priority areas, the following groups were engaged through focused outreach:

- People living on a low income;
- People experiencing homelessness or housing instability;
- Youth;
- Post-secondary students;

- Immigrants and refugees (5 languages – Arabic, Farsi, Mandarin, Spanish and Tigrinya);
- Older adults;
- People living with disabilities;
- Single parents; and,
- Single adults.

Focused group outreach included conducting a mini-survey using the Canadian Index of Wellbeing survey tool. The survey was administered through partner organizations who work with the focused groups noted above resulting in the completion of 530 surveys. Feedback was also provided through additional roundtable discussions. This feedback went on to inform the WWR initiative and the priority areas selected.

In addition, we made a concerted effort to engage our rural population to reflect the different geographies in Waterloo Region. We held a public consultation for our rural townships (Wellesley, Wilmot, Woolwich or North Dumfries), which was attended by rural service providers and a cross-section of the community. Similar to the rural community engagement, we wanted to ensure those experiencing homelessness, food security, social or mental health issues were heard through our consultation process. Representatives from community organizations providing support to these community members were invited to provide feedback through both our smart city survey and our stakeholder sessions.

## **Future Community and Youth Engagement**

Ongoing meaningful engagement with our partners, stakeholders, and community will be critical to the success of the Smart Waterloo Region project. Throughout the Phase 2 application process, we will engage our children and youth to ensure they are directly involved in the development of our smart city solution. This will continue through the implementation Phase 2 and on an ongoing basis, to ensure that our programming and support continuously evolves with the needs of our children and youth. We will also create a Youth Committee comprised of Waterloo Region children and youth to provide feedback on our project as it moves through Phase 2.



In addition, we will ask the community, project partners, working group and committee members to become ambassadors of our Smart Waterloo Region project to engage their networks, creating buy-in and continuing to help promote our collective approach and efforts.

Through Phase 2 we will work with partners to develop a communication and engagement strategy to inform the public through digital, experiential and traditional communication tactics. We will develop and host interactive Smart Waterloo Region Update presentations throughout the community, providing regular updates on project progress to the public, and stakeholder and partner organizations. These presentations will function as interactive touch points between the community and our project efforts.

Also, we will work with partners to create community-wide experiential learning and engagement opportunities for children, youth and the public to engage with projects and tools created, encouraging new partnerships and inclusion programming where applicable. This will culminate in a Smart Waterloo Region day event, which will invite the community to meet with partner organizations in both urban and rural spaces for residents to engage with, and experience, the projects developed. Additionally, we will engage our community further through pop-up information sessions to collect more feedback as needed. All of our outreach and engagement will be supported by social media and marketing campaigns. Our goal is to ensure our community is informed and engaged at every stage.

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## Question 6 (2,000 words)

### **Please describe your preliminary proposal and its activities or projects.**

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.

Waterloo Region is home to world renowned research institutions such as the Institute for Quantum Computing and Perimeter Institute. We are also home to a number of technology leaders in the education and smart city technology space like Desire2Learn, Miovision and Google. This technology and talent base is supported by our post-secondary institutions, the University of Waterloo, Wilfrid Laurier University, and Conestoga College. Organizations such as Communitech, the University of Waterloo Velocity Garage and Accelerator Centre have also supported the development of Waterloo Region to become one of Canada's leading technology communities. As outlined in Question 10, we will leverage this ecosystem of research, talent and technology to further develop our proposed projects outlined below.

While ambitious, the community partners that have come forward to support the smart cities initiative in Waterloo Region believe that with the support of the federal program, our in-kind financial support, our knowledge-based sectors, and community participation, Waterloo Region will be able to achieve our challenge statement through the implementation of the proposed projects and programs. Additional projects and programs will be added through the Phase 2 application process.

### **Community-Based Data Platform**

At the centre of our smart city solution will be a community-based data platform and smart web and mobile applications that will connect organizations that provide support services to children and youth. While strong partnerships have allowed organizations in Waterloo Region to work together on key initiatives and challenges facing our children and youth, the development of integrated databases and smart technology solutions, and partnership opportunities with technology companies remain missing components in our collaborative efforts. Through our smart cities initiative consultation process, we were able to verify that there are multiple databases housed and managed by different organizations across different sectors (e.g. municipalities, Public Health, school boards, Family and Children's Services, police services etc.) in Waterloo Region. For various reasons, including data privacy, organizations have struggled to share this data with each other, limiting our community's ability to identify and address child and youth wellbeing challenges.

Combining this community data into one data platform that can be viewed through smart web and mobile applications governed by data-sharing agreements will allow our community to develop the social policies, strategies, and programs needed to create a community ecosystem for child and youth support. Many communities across Canada use Statistics Canada data and data from other federal and provincial agencies to



support their platforms. This data is not robust enough to fully characterize and monitor a community's performance on wellbeing. In contrast, our proposal will use community data from local organizations that will allow us to measure both wellbeing in Waterloo Region and to monitor the consequences of policies and services implemented to serve healthy children and youth.

The community-based data platform will allow organizations that collect and analyze data to transfer data securely between individual databases housed at participating organizations and a centralized database. Data that is shared would be based on parameters that account for the privacy and security considerations of each organization. It will also factor in proprietary considerations relating to smart technology solutions and products that connect to the community-based data platform.

### **Canada's First Real-Time Child and Youth Wellbeing Dashboard**

Participating organizations connected to the community-based data platform will share data and information as soon as it is available. Data that is shared will pass through a software filter using technology solutions based on big data and artificial intelligence concepts that collect, organize, and analyze the data against predetermined parameters. The analysis will then measure overall impact on child and youth wellbeing in Waterloo Region against UNICEF Canada's new Canadian Index of Child and Youth Wellbeing (once finalized). This measurement will be posted instantly to Canada's first real-time child and youth wellbeing dashboard. Through the smart cities initiative, the development of a real-time child and youth wellbeing dashboard will allow the public, organizations that support children and youth, educators, and decision-makers to identify where we as a community need to target our efforts and resources. It will also allow our community to respond with programs and services faster to where they are needed most. Data that feeds the real-time dashboard will be made available based on personal and community privacy considerations in a new open data portal accessible to the public, institutions and organizations doing research and development, as well as private sector companies developing new products and solutions to support children and youth.

## Implementation of Predictive Analytics

To respond faster with early intervention strategies and programs in all six of our priority child and youth wellbeing areas, we will look to predictive analytics to better understand community assets and identify the challenges our children and youth are facing. Many of the “digital symptoms” required to identify vulnerable students already exist within schools and community supports organizations today. By using these sources of data, predictive analytics can inform decision-making at all levels, as well as provide personalized plans that empower youth, educators and community organizations to take meaningful action. School boards can also use these tools and information from high schools to direct resources toward students in earlier grades. We will apply a predictive analytics model that will be able to identify, with more accuracy, the youth most at risk. As the picture of wellbeing becomes more clear, and early intervention becomes more robust, more children and youth now and in the future will have an equitable opportunity at building the skills they need to succeed in life, school and beyond.

## Broader Education Platforms

Through our smart cities community engagement process, there was consensus on the need for broader learning platforms to support child and youth in becoming lifelong learners. To help increase our high school graduation rates and literacy rates, we will customize the learning experience for children and youth in our community. It will also support the efforts of our school boards and community organizations to improve literacy and increase our community’s below average high school graduation rates.

Using technology products and solutions that can be customized, our school boards, educators, parents, and other learning institutions will be able to develop the best learning solutions for children and youth based on individual needs. These solutions will apply in and outside of the classroom and will support learning and development at home, in our community spaces, and through experiential learning with community partners. Based on metrics from the community-based data platform, and by using predictive analytics, educational leaders will be able to target challenges that arise in child and youth learning at early stages.



## Connected Community Spaces

Programming in all six priority areas will occur throughout local community spaces and facilities which we will make connected places with access to technology for learning. Our smart city engagement process has strengthened our community's view of the opportunity our libraries, museums, community centres, arenas, and parks have in supporting our children and youth. These spaces will become new centres of learning and support where children and youth in Waterloo Region can safely access technology such as maker spaces and virtual reality solutions that complement opportunities for creating and learning done in the classroom. They will be places that children and youth can rely on for mental and physical health supports, a wide range of programming centred around technology or enabled by technology, and places where children and youth come together to innovate. These spaces not only present an opportunity for children and youth, but they will also become places to offer connected programming and support for parents and educators as it relates to early child development, health and nutrition, e-learning and early intervention strategies. By transforming these spaces, we will be able to surpass any barriers created by our urban and rural geography.

## Programming

Using technology solutions such as mobile apps, gamification, and augmented reality, we will develop programs that support the physical, emotional, cognitive and social skills needed for future success. We will also develop e-learning programs and in-person programming to support parents and educators to customize early child development solutions for every child in Waterloo Region. This programming will be linked to our community-based data platform and an enhanced version of our community programming portal for children and youth. Not-for-profit, private, educational, and government organizations will use this portal as a central database for programs that support child and youth development. It will be accessible online to the public and through mobile apps that allow parents, educators, and youth to enroll in programming in Waterloo Region.



## Mentoring

Through the smart cities initiative, we will change our community approach to mentoring. Mentoring our youth will reinforce feelings of being cared for, assist youth in overcoming challenges, and provide positive direction in educational development.

Leveraging technology solutions that help our private sector and community leaders integrate mentoring into their respective organizational cultures will increase the number of mentorship opportunities available throughout Waterloo Region. These technologies will also link these organizations supporting mentorships directly with the organizations finding mentors for youth.

## **Volunteering**

Another key outcome of our smart cities engagement was to increase volunteer opportunities for youth in our community. We will develop a framework for meaningful volunteer and service opportunities that is aligned with and linked to the Government of Canada's new national youth service initiative, the Canada Service Corps. The framework for volunteering will support youth with skills development, creating a sense of belonging, and empowering youth to become engaged and give back to the community. Volunteer opportunities from different organizations across the community will be coordinated through a volunteer database. A portal that will be accessible online through mobile applications, and at kiosks at our connected community spaces, will help youth find volunteer opportunities that are aligned with individual interests.

## **STEAM Initiatives**

We will take a new coordinated approach to STEAM initiatives and programming in our community as part of our smart cities solution to increase high school graduation rates. We will build on our existing STEAM initiatives for children and youth by leveraging our connected community spaces with programming and technology solutions offered through academic institutions like the University of Waterloo Games Institute or the Centre for Education in Mathematics and Computing. We will also partner with not-for-profit, research, and private sector partners to create dedicated centres for STEAM learning. As part of our STEAM initiative, we will support the development of LAUNCH Waterloo. Supported by private sector companies like HIP Developments, Vidyard, and Shopify along with research organizations like the Perimeter Institute and Institute for Quantum Computing, LAUNCH will offer programming, access to technology and mentors, and group competitions in STEAM learning. LAUNCH will be available to all youth but will target underrepresented youth in Waterloo Region including girls, indigenous youth, LGBTQ2, and children in lower-income families. We will also partner with Google to develop and deliver science, technology, engineering, and mathematics (STEM) programming and access to technology to youth at its new community space located at the Google Kitchener office. Similar to LAUNCH, we will work in partnership

with Google to support STEM programming for underrepresented and underprivileged youth in Waterloo Region.

Our smart city solution will not only be customized to meet the needs of children and youth in Waterloo Region, but it will be developed through the lens of being transferrable to meet the different needs of communities across Canada. We will consider factors such as population, community capacity and resources, geography, urban, rural, indigenous communities, newcomers, and equity. Our solution will leverage transferrable architecture like cloud-based technologies and strategies that can provide cost savings and flexibility in customizing our healthy children and youth framework to individual community needs. UNICEF Canada will partner with Waterloo Region through the One Youth Initiative to help scale our smart solution to communities across the country. This will include data management, technology products and solutions, support with implementation and customizing the measurement framework to UNICEF Canada's Child and Youth Wellbeing Index.

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## Question 7 (500 words)

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

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

The Region of Waterloo and area municipalities have individual strategies and community-based plans with many common medium and long-term goals.

Both at the area municipal and regional level, our community is concerned with how children and youth in our community are advancing through life. The Cities of Cambridge and Waterloo ([Goal 1.3, City of Cambridge Strategic Plan](#), and [Strong Community Objectives, City of Waterloo Strategic Plan](#)), for example, place priority on improving community wellbeing with an inclusive approach for community members of all ages. Consideration for child and youth wellbeing has also been identified by Wilmot Township ([page 9, Wilmot Township Strategic Plan](#)), the City of Kitchener (City of Kitchener Youth Services Strategy) and at the regional level ([Strategic Objective 4.1,](#)

[Region of Waterloo Strategic Plan](#)) through the creation of healthy, safe and inclusive communities that support the early learning and development of children.

Another common theme represented in the majority of area municipalities' strategic plans is the creation of open and accessible community spaces. Our key projects will leverage shared community spaces to engage children and youth, which aligns strongly with many of our municipal partners' medium and long-term goals. Through our smart cities project, we will invest in these spaces (e.g. libraries, museums, community centres, etc.) to ensure accessibility for children and youth.

Another key theme found in every area municipal and regional strategic plan is attracting and retaining top talent to achieve local economic development goals. Our communities recognize that our children and youth need to have the best possible chance of success in the rapidly evolving labour markets, economy, and overall community. As social demographics shift, attracting families to our community and creating an environment where talent can see themselves living and investing socially is key. To prosper through the attraction and retention of top talent means investing in community and social systems to increase child and youth wellbeing.



Community partnerships and collaboration are necessary for Waterloo Region to improve child and youth wellbeing. Fortunately, our community sees the immense value of strengthening and making new community partners and working together through collaboration. Medium and long-term municipal strategic planning goals consistently emphasize the need for a collaborative, community partnership-based approach to strengthening service delivery and development. As a community, we have long recognized the value of working together, continuously strengthening and redeveloping relationships to make sure all residents in Waterloo Region have the opportunity to thrive. Community partnerships and collaborative problem solving that involve the meaningful inclusion of children and youth will allow us to achieve our goal of becoming the benchmark community for child and youth wellbeing in Canada.

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## Question 8 (1,000 words)

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

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.

The Region and seven area municipal governments work together on a regular basis to deliver better services in areas such as land use planning, infrastructure management, social services, emergency services, and business development. The Region of Waterloo leads or supports the delivery of these services throughout our urban and rural parts of Waterloo Region with 2983 staff, an operating budget of \$836.6 million, and a capital budget of \$666.7 million (2017). Waterloo Region has a strong record for leading complex initiatives that require the support and participation of provincial and federal agencies, community stakeholders and private sector partners. A recent example is ION Light Rail Transit, which is the largest single infrastructure project in Waterloo Region's history. The Region managed this complex project from inception through to construction. Lessons learned from the ION project have since been applied to the King-Victoria Transit Hub in Kitchener, which will be the first fully integrated transit facility and mixed-use private development on the GO Transit network.

In 2007, the Region and area municipalities founded the Waterloo Regional Tourism Marketing Corporation (WRTMC) to increase the number of visitors to the region. The WRTMC now partners with hundreds of private sector members to promote the region to high-potential markets. The Waterloo Region Immigration Partnership is another example of collaboration between the Region, area municipal governments, private sector, not-for-profit organizations, and community members. The Immigration Partnership has a leadership Council and three Steering Groups, which are responsible for facilitating the successful settlement, integration and employment of refugees and immigrants in Waterloo Region.

In 2010, to support the life sciences industry in Waterloo Region, the City of Kitchener and the Region of Waterloo partnered with the Ministry of Training, Colleges and Universities and McMaster's School of Medicine to establish a health sciences campus in Downtown Kitchener. The campus focuses on pharmaceuticals and biotechnology, and the investment made by its founders was a catalyst for Kitchener's revitalization.

A partnership between entrepreneurs and local government in the late 1990s resulted in the creation of Communitech. The goal was to make Waterloo Region a global innovation leader. This vision was further supported in 2006, when the Region of Waterloo, City of Kitchener, City of Waterloo, and the University of Waterloo came together to fund the Accelerator Centre. Today, Communitech and the Accelerator Centre are globally recognized technology start-up incubators. With founding partners CIBC, City of Waterloo and Quantum Valley Investments, Communitech launched its Data Hub in Uptown Waterloo to support its data-driven clients and partners. Also in 2017, the Region of Waterloo partnered with Rogers Communications to bring low-cost, high-speed internet to 12,000 low-income housing tenants in Waterloo Region.



The community also has a strong foundation of bringing not-for profit sectors (e.g. government, not-for-profit, education, health, research, funders etc.) together for meaningful collaborative work. Wellbeing Waterloo Region and the Children and Youth Planning Table are great examples of a community-led initiative that has bridged relationships not only between sectors, but between multiple planning tables and networks. The initiative has set a strong foundation of addressing complex issues through collective, aligned and coordinated efforts of multiple stakeholders.

At the start of the Phase 1 smart cities application process, the Region and seven area municipalities established a Steering Committee, which was supported by a community Advisory Committee and a staff working group. In Phase 2, we will adopt a similar approach with a Steering Committee made up of senior management from the Region and seven area municipalities, the Children and Youth Planning Table and UNICEF Canada that will be responsible for providing direction on the development of the solution. An Advisory Committee of experts in child and youth wellbeing, technology solutions that support child and youth development, as well as data management will be established to provide strategic guidance to the Steering Committee and broader project team. A Youth Committee, comprised of Waterloo Region children and youth, will be created to provide feedback on projects and programming through Phase 2. Also, a working group of key representatives from partner organizations, consultants, and municipal staff will be established to support the development of the overall smart city solution. Early in the Phase 2 application development process, we will develop a comprehensive selection process to identify and select the best technology products and solutions that will be adopted to support our smart city solution. This process will help manage the interest from local and international companies interesting in partnering with our community.

Through the Phase 2 process, we will develop a management structure and full implementation team made up of representatives from organizations providing support services to children and youth in the community. Ultimate accountability for implementation, reporting, and achieving the goals outlined in the challenge statement will remain with the Region and seven area municipalities. However, community partners responsible for delivering projects or programs will be key members of the project management and implementation team.

## Challenges

The Region and seven area municipalities have worked to make municipal data open and available to the public. However, we continue to experience challenges in the coordinated approach to collecting, filtering, and making data available for the public. Through the smart cities initiative, we will transform the way we collect and share data with the public, private and not-for-profit organizations, and research institutions while ensuring that sensitive personal and business information remains secure. The smart cities initiative will also require partner organizations to look at how they are managing and sharing their own data while ensuring data security concerns are met. This shared approach to the overall management and openness of data will be the determining factor in our ability as a community to measure our success in achieving our smart city goals.

Through the Smart Cities Initiative, the Region and seven area municipalities will also review and identify opportunities to enhance their policies relating to supporting innovation, integration of technology, and acquisition of smart technology products or solutions. These policies may include but are not limited to procurement, information technology, and community engagement.

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## Question 9 (500 words)

**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.**

In Phase 1, the Region and seven area municipalities allocated \$85,000 in funding towards public consultation and stakeholder engagement. This funding was further

supported by dedicated staff resourcing from each of the municipalities to oversee the Phase 1 process and the development of our application. In Phase 2, we will contribute staff resources to support the development of the full application. This work will align with the planning expenditures for the \$250,000 grant from Infrastructure Canada, which will contribute to the following project activities:

**Consulting Services** – With the number of community partners involved in developing our smart city solution, we will use \$75,000 to retain a consultant to assist in coordinating the development of projects and programs. This consultant will facilitate our additional community engagement that will be required to support the full development of our smart cities solution.

**Community Engagement** - \$25,000 will be used to fund community engagement activities and focus groups. In addition to the general public, these engagement activities will target underrepresented and underprivileged youth in our community to help focus programs and projects in our six priority action areas.

**Data Framework** – To create the community-based data platform, information portal, and real-time child and youth wellbeing dashboard, we will use \$65,000 to retain a technology and data consultant to help build the framework of our platform in partnership with our community partners.

**Staff Support** – To support the overall development of the Phase 2 application, \$75,000 will be used to hire 1.5 contract Full-Time Employees (FTE) for the duration of Phase 2. These staff will support with project coordination, data collection, community engagement, partner collaboration, and application development.

**Community Awareness and Outreach** – As part of the Phase 2 process, we will develop a healthy children and youth smart cities campaign to raise awareness of our Phase 2 application process. \$10,000 will be used to encourage our community to be a part of the development process and participate in our engagement sessions, and undertake targeted outreach to youth in our community through social media, online, our schools, and not-for-profits (for more information, see Question 5).

The Region and area municipalities will contribute in-kind and/or direct funding to complement or enhance each of the budget areas as needed to ensure the successful development of our full Phase 2 application.

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## Question 10 (500 words)

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

This section should include:

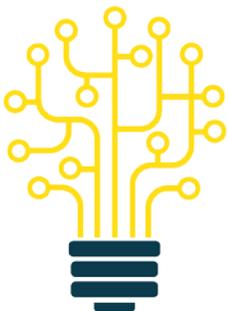
- A description of existing partners (what type of organization, what they do, etc.), their relevance, and expected contribution to the outcome (or outcomes).
- Where partners are not yet determined or where it is anticipated that additional partners are required, describe the process for selecting them.

Through the smart city initiative, Waterloo Region has officially partnered with UNICEF Canada through the One Youth Initiative to develop our real-time child and youth wellbeing dashboard. UNICEF Canada will work with us to develop the measurement framework that will allow communities across the country to measure child and youth wellbeing against UNICEF Canada's Child and Youth Wellbeing Index. UNICEF Canada will then work with us to scale our smart city solution to communities of all sizes across Canada.

The Children and Youth Planning Table of Waterloo Region will be a key partner in the development of the Phase 2 work, community engagement (including with children and youth), and leveraging the engagement and knowledge of the local organizations serving children, youth and families. The Children and Youth Planning Table will support work to create the strategic vision of the policies, programs, and projects needed to impact child and youth wellbeing. They will also work directly with UNICEF Canada on the development of the child and youth wellbeing dashboard and measurement framework.

As part of the smart city initiative, the Waterloo Region District School Board, the Waterloo Region Catholic School Board, and the two French Language School Boards, Le Conseil scolaire catholique MonAvenir and Conseil scolaire Viamonde will work in collaboration with community partners to address broader challenges that affect high school graduation rates.

All three of Waterloo Region's post-secondary institutions will support the development and implementation of our solution. At the University of Waterloo, the School of Planning, the Centre for Education in Mathematics



and Computing, the Games Institute, and the Applied Public Health Research Team will support ongoing research and the development of programming relating to mental and physical health, STEAM, youth mobility, youth engagement, and education platforms. Wilfrid Laurier University's C3 Innovation Lab will assist with the design process. Conestoga College's Centre for Smart Manufacturing will support applied research opportunities.

We will work with a number of start-up technology companies on youth engagement, mentorship, and programming for educators and parents. We have partnered with Desire2Learn, Knowledgehook and Chalk to enhance programming platforms for educators and develop modelling for predictive analytics. Partnering with HIP Developments and Google, we will leverage connected community spaces for STEAM learning. Miovision will help us design solutions for youth to travel safely around our community; Google, Canada's Open Data Exchange and the Centre for Community Mapping will contribute to the development of a framework for securely sharing data between organizations; and Vidyard and World Vuze will support through additional resourcing and youth engagement.

Working with our technology leaders like Communitech, we will identify additional partnership opportunities with technology companies not already identified through our Phase 1 process. We will rely heavily on these local organizations to be a part of the development of our smart city solution but where appropriate, look to organizations outside of Waterloo Region to address any potential gaps in knowledge or technology products and solutions.

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## **Question 11 (confidential annex – 500 words)**

### **Please provide, if and only if required, confidential third party information.**

Information provided in this section will be exempt from the requirement to be posted online.

Third party information in this section should be supplemental to the information provided elsewhere in the application and be limited to those details that are deemed confidential. Please clearly indicate to which question(s) the information provided in this section relates.

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## Question 12 (200 words)

### **Provide a summary of your preliminary proposal.**

This summary, along with your Challenge Statement, will be posted online in both official languages.

You have the option of providing the summary in both official languages. If you provide it in one official language, Infrastructure Canada will translate it prior to posting online.

We have selected Healthy Children and Youth as our smart cities challenge area. Based on data and community consultation, we have identified six priority areas of focus that will address through our smart cities initiative: early child development; mental health; bullying; literacy rates; high school graduation rates; and youth sense of belonging. Working with our local youth and community partners from the private, not-for-profit, educational and government sectors, we will develop connected community spaces, broader education platforms and technology-based programming that supports equity, mentorship, volunteering, mental health, food security and nutrition and STEAM learning.

In partnership with UNICEF Canada and their One Youth Initiative, we will build Canada's first real-time child and youth wellbeing dashboard. Using a community-based data platform that connects data from multiple organizations, we will create a framework that measures child and youth wellbeing in Waterloo Region against UNICEF's Canada's Child and Youth Wellbeing Index. Together, we will work with UNICEF Canada to scale this framework to communities of all sizes across the country helping to make Canada the number one country in the world for child and youth wellbeing over the next decade.

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## Question 13

**Provide the link to the online location where you will post your responses to questions 1 to 10.**

You may also provide your responses to any other questions. Your responses must go live on the URL provided once you have received confirmation in early to mid-May that your application is eligible.

<https://www.regionofwaterloo.ca/SmartWaterlooRegion/>

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## Question 14

**In accordance with your governance structure, provide evidence of the commitment to your preliminary proposal from your community's leadership.**

This can be a letter of support with signatures from your mayor(s), chief(s), or equivalent or a council resolution, a band council resolution, etc.

If you would like to see all letters of support, please contact us:

[ecdev@regionofwaterloo.ca](mailto:ecdev@regionofwaterloo.ca)

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## Question 15

**Please identify the point of contact for the application.**

Matthew Chandy  
Manager, Economic Development  
Region of Waterloo

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## Question 16

**Read the Consent and Release Form and Communications Protocol, and indicate your agreement.**

We have read and agree to the consent and Release Form and Communications Protocol.

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## Question 17

**For each community, provide the following information:**

2017 full-time equivalents (FTEs):

- Number of total FTEs
- Percentage of total FTEs devoted to innovation

2017 operating and capital budgets:

Total operating budget

- Percentage of total operating budget devoted to innovation
- Total capital budget
- Percentage of total capital budget devoted to innovation

If you would like to view this information, please contact us: [ecdev@regionofwaterloo.ca](mailto:ecdev@regionofwaterloo.ca)

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## Question 18

**Please select the focus area of your preliminary proposal.**

If your preliminary proposal seeks to achieve outcomes that span more than one area, you may choose up to two.

Focus area - 2 maximum (required)

- Economic opportunity
- Empowerment and inclusion (Selected for WR)
- Environmental quality
- Healthy living and recreation (Selected for WR)
- Mobility
- Safety and security

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## Question 19

**Select all the community system/service areas expected to be implicated in your preliminary proposal.**

There is no limit to the number of community systems/service areas you may select.

Community system/service (required)

- Arts and culture (Selected for WR)
- Economic development (Selected for WR)
- Education and training (Selected for WR)
- Emergency services and enforcement
- Environment
- Land use planning and development (Selected for WR)
- Public health (Selected for WR)
- Recreation and parks (Selected for WR)
- Roads and transportation (Selected for WR)
- Social services (Selected for WR)
- Waste
- Water and wastewater
- Other: please specify

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## Question 20

**Select all the technologies expected to be implicated in your preliminary proposal.**

There is no limit to the number of technologies you may select.

- Technologies (required)
- Artificial intelligence (AI) (Selected for WR)
- Assistive technology (Selected for WR)
- Augmented reality (AR) or Virtual reality (VR) (Selected for WR)
- Autonomous and connected vehicles
- Big data analytics (Selected for WR)
- Cloud computing (Selected for WR)
- Enterprise solutions (Selected for WR)
- Environmental monitoring
- Geospatial (Selected for WR)
- Health or Medical technology (Selected for WR)
- Internet of Things (IoT) (Selected for WR)
- Mobile applications (Selected for WR)
- Networks (Selected for WR)
- Open data platforms (Selected for WR)
- Payment platforms
- Sensors (Selected for WR)
- Video analytics (Selected for WR)
- Wearables (Selected for WR)
- Other: Please specify