SMART CITIES CHALLENGE

APPLICATION ON BEHALF OF

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TOWN OF ANNAPOLIS ROYAL/ MUNICIPALITY OF THE COUNTY OF ANNAPOLIS / TOWN OF DIGBY / MUNICIPALITY OF THE DISTRICT OF DIGBY

APRIL 2018

SECTION 1: APPLICANT INFORMATION

Question 1: Please provide information on your community

This application is a regional initiative that involves four municipalities: Town of Annapolis Royal, Municipality of the County of Annapolis, Town of Digby, and the Municipality of the District of Digby.

NAME OF COMMUNITY: Town of Annapolis Royal
PROVINCE/TERRITORY: Nova Scotia
POPULATION: 491

NAME OF COMMUNITY: Municipality of the County of Annapolis
PROVINCE/TERRITORY: Nova Scotia
POPULATION: 18, 252

NAME OF COMMUNITY: Town of Digby
PROVINCE/TERRITORY: Nova Scotia
POPULATION: 2,060

NAME OF COMMUNITY: Municipality of the District of Digby
PROVINCE/TERRITORY: Nova Scotia
POPULATION: 7,107

INDIGENOUS COMMUNITY: NO

Total population: 27,910

Question 2: Please select a prize category

$10 million prize – communities under 500,000 residents

SECTION 2: PRELIMINARY PROPOSAL

Question 3: Please define your Challenge Statement in a single sentence that guides your preliminary proposal. It should describe the outcome (or outcomes) you hope to achieve. (50 words max)

To provide a safe and secure environment for citizens of four municipalities through the development of a flood mitigation system that will also incorporate a renewable energy source, ensuring the promotion of growth, sustainability and protection of the region.

Question 4: Please describe the outcome (or outcomes) your proposal seeks to achieve by elaborating on your Challenge Statement. (2,500 words max)

Nestled along ancient mountains and framing bodies of water fed by the Bay of Fundy's highest tides in the world, our four municipalities are situated in an area particularly vulnerable to rising sea levels and storm surges as over 160 billion tonnes water flow in and out of the Bay of Fundy daily.

Storm surges associated with those tides pose a significant threat to our communities. But those same tides possess the potential to generate renewable energy. Infrastructure that could both harness the power of the tides and reduce the threat of sea level rise would make our region a leader in innovation and set a precedent for smart cities approach to a pressing global issue.

With this project, the Town of Annapolis Royal, Municipality of the County of Annapolis, Town of Digby, and Municipality of the District of Digby are aiming to have engineers create a pioneering piece of infrastructure.

We are proposing a superstructure that will utilize the geography of the area to create a hybrid flood mitigation and renewable energy system to be installed at the Digby Gut. The structure will make use of connected technologies in a multitude of ways. The desired outcome is that the development of this structure will create a safe and secure environment for the residents of the involved waterfront communities. This safety will ensure the continued sustainability of the region through population growth, economic growth and development, creation of jobs in the area that will attract a younger demographic, protection of existing industry, protection of Canada's built heritage, and allow the region to thrive as a tourism destination. Importantly it will also afford the

preservation of some of Canada's most significant national historic sites. For thousands of years, these lands were Mi'kma'ki – the ancestral homeland of the Mi'kmaq. With the arrival of Europeans in 1605, the region played a pivotal role in the early origins of Canada. Irreplaceable cultural landscapes and historic homes and fortifications are at risk from rising sea levels and storm surges.

The exact formation the structure will assume has yet to be determined. An outcome of this proposal is to source the creation of the structure. Sourcing, inspiration, and knowledge would be drawn from the region, across the country, and internationally. It is an incredibly ambitious project but not unachievable. There are similar examples around the world that may have seemed overly grand at the idea level, but were ultimately executed through partnerships with commitment and vision.

Context is required to understand just how important this project would be to our region. To do this, a description of the area is helpful. All the regional partners have shoreline along waterways fed by the Bay of Fundy; the Annapolis Basin, Annapolis River, and Bear River. The gateway is through the Digby Gut, which opens into the Annapolis Basin. Many of the communities that line these bodies of water sit at sea level.

Unrivalled in its tides, the Bay of Fundy has an enormous tide cycle. Twice a day it empties and fills with more water volume than contained in the flow of all the world's freshwater rivers combined. As the average ocean tidal range is one metre (3ft), the Fundy's tidal range of sixteen metres (53ft) is truly unique - with the highest tides located at the head of the Bay in the Minas Basin. These record setting tides are caused by the size, distinctive shape of the Bay and the volume of water. The Digby Gut has some reprieve of such variance in tides but they are still exceptional; approximately 9 meters, making it a superior location for the installation of a flood mitigation and renewable energy system.

Two points of land in two different municipalities bookend the Digby Gut; the Municipality of the District of Digby and the Municipality of the County of Annapolis. Being a narrow passage at only 1.6 km at its widest point, 0.8 km wide at its narrowest point, and approximately 4.5 km long, the Gut would allow for a structure that is not massive in scale. There are several considerations that need to be afforded in the building of a structure, including the incredible force and unparalleled energy of the tides. The Gut is a strategic transportation route utilized by ferries that connect Nova Scotia and New Brunswick. It is also the gateway passage for the multi-million dollar a year fishing industry, with the Town of Digby's wharf serving as the home port for fishing fleets in the region. A significant economic driver, the fishing industry has deep multi-generational roots in the area. With an aging demographic, the fishing industry represents stable employment opportunities that support young families. Accordingly,

any structure at the Digby Gut would need to ensure unrestricted movement of marine vessels through the channel. Currently, there is no infrastructure in place to deal with rising sea levels and associate storm surges. There are land forms and natural aids that influence the direction of the tides, but these are not adequate to deal with the devastating flooding that is forecast to occur in the future (further details below).

Considered to be the world leader in flood mitigation, Holland concluded that walls and barriers against rising sea levels and storm surges are problematic in a number of ways. We are not proposing a permanent wall-like structure that severs the land from the sea as this would affect ecosystems, the economy, sea transportation systems, and be a blight on a breathtaking vista. We envision a structure with mobility. The flood mitigation component will allow for water diversion and regulation and will remain open with elements that can move into place when a threat looms. Currently a groundbreaking piece of engineering that draws parallels to our proposal exists in Rotterdam, Holland. The Maeslant structure is the largest mobile barrier in the world and protects the city from outflows from the Meuse, Scheldt, and Rhine Rivers while also sitting not far from the North Sea. The Maeslant structure is gigantic, with two horizontal steel lattices twice the size of the Eiffel Tower that can be closed to protect the city from storm surges up to three metres (10ft); but otherwise designed to allow for water flow and unimpeded marine traffic. An absolute requirement as Rotterdam is Europe's largest port.

This proposed project cannot work without a smart cities approach using connected technologies. The structure and its ability to function are dependent on accurate live data collected and interpreted by connected technologies. Sensors are required to receive data that measures water levels, interprets weather, and provides warning to citizens and emergency services if a threat looms. Additionally, extensive data is required for a functioning renewable energy source- all this data cannot be interpreted without the use of state of the art technologies that work together to provide multi-layered applications. The exact type of technology will be determined in the engineering specs of the structure but in review of other flood mitigation systems and renewable energy sources, we anticipate the use of environmental monitoring, geospatial technologies, sensors, open data platforms, mobile applications, cloud computing, artificial intelligence, and the internet of things. These technologies are the platform for providing safety and security to citizens. There are a host of connected technologies utilized around the globe for flood warning. Nova Scotia is at the cutting edge of some of these technologies. Dr. Tim Webster, a research scientist with the Applied Geomatics Research Group at Nova Scotia Community College (NSCC) in Middleton, Annapolis County, has done extensive flood mapping of the area utilizing Light Detection and Ranging (LiDAR). This technology "... supports activities such as inundation and storm surge modeling, hydrodynamic modeling, shoreline mapping,

emergency response, hydrographic surveying, and coastal vulnerability analysis... LiDAR systems allow scientists and mapping professionals to examine both natural and manmade environments with accuracy, precision, and flexibility."

A 2010 study by Dr. Tim Webster utilized LiDAR data of Annapolis Royal and examined data of the Annapolis Basin and Bay of Fundy to determine the likelihood of flooding in the area. To gauge his estimated flood projections, he combined the estimated ~20 cm per century subsidence rate in the region, the expected increase of 10 cm in tidal range of the Bay of Fundy, the probable 80 cm increase in sea-level in the next century, and past water levels of storm surges. His analysis concluded that "Annapolis Royal is vulnerable to storm surges and a rising sea-level", particularly the lower part of St. George Street; the main street of town that is both a residential and business district, and National Historic District. Dr. Webster and his team are heavily invested in advancing the applications of LiDAR. In March 2017, they launched an online mapping tool that can be utilized to predict coastal flooding down to the meter. It can give emergency officials warning of impending threats 10 days in advance, allowing for appropriate planning and measures to be taken to protect citizens and communities. Our proposal would make use of this tool.

A smart city though does not cease with the implementation of connected technologies. It extends to the protection of these technologies. Arnoud Molenaar, Rotterdam's climate chief has been quoted as stating that "you need cyber-resilience, because the next challenge in climate safety is cybersafety. You can't have vulnerable systems that control your sea gates and bridges and sewers." This would entail having a closed electronic system.

Mr. Molenaar also states that "a smart city has to have a comprehensive, holistic vision beyond levees and gates...You need public awareness." This awareness creates buy-in and rouses citizens to actively participate in changes they can undertake at an individual level. To aid in this engagement and awareness, we would follow Rotterdam's example and develop an app that allows users to access real-time data of water levels.

This project is not about mollifying Mother Nature but rather working with her to harness her power. While the storm mitigation structure will at points of deployment tame Mother Nature, the secondary use of the structure will exploit her power to create a renewable energy source. The Bay of Fundy has been identified as being one of the top spots in the world for tidal energy, with Digby Gut being a premier location. Climate change is undeniable, and all levels of government need to support energy sources that reduce contributions to climate change. Our proposal is a significant step in that direction.

While there are questions around the marine environmental impacts of tidal energy, the newer forms are being designed with aquatic life in mind. There have been major advances in the design, which continues to evolve. Federal and provincial governments are highly committed to pursuing tidal energy, with emphasis on the Bay of Fundy. Examples can be found in the federal government providing $1 million in funding in 2017 to a project by Offshore Energy Research Association (OERA) to examine gaps in knowledge in tidal funding. This includes ways in which technologies can be utilized to reduce tidal energy costs. The Government of Nova Scotia is so committed to tidal energy as a renewable resource that in in October 2017 it was announced that amendments were being made to "...the Marine Renewable-energy Act to make it easier to assess innovative, lower-cost tidal energy technologies and help developers bring them to market faster." In 2009, Fundy Ocean Research Centre for Energy (FORCE) was established. It includes the Province of Nova Scotia and five tidal energy developers selected by the Province. FORCE has two objectives: "to permit, construct and operate a tidal turbine test and demonstration facility in the Bay of Fundy; and, to engage in, and enable monitoring and research associated with the deployment, installation, and operation of tidal in-stream energy conversion (TISEC) devices. The Clean Energy Fund awarded FORCE $23M to design and build onshore and offshore infrastructure, as well as for the development of Fundy Advanced Sensor Technology (FAST) – a research program to build recoverable instrument platforms designed to monitor and characterize the FORCE site."

The energy potential is so vast that one industry expert referred to the Bay of Fundy as the "Saudi Arabia" of marine renewable energy. Terry Thibodeau, Coordinator Renewable Energy & Climate Change for the District of Digby, has been quoted as saying "the future looks bright for renewable energy technologies in The Municipality of the District of Digby. There are a myriad of opportunities from tidal development, to biogas production, wind and smart grid technologies. Companies from around the globe want to be part of the supply chain to the tidal industry. Our location has an appeal beyond our wildest expectations and this will translate into a robust regional economy..." Our region is fortunate to have the Bay of Fundy at our fingertips and the potential revenue generation the Bay brings. This revenue would allow the offset of capital expenses required for a flood mitigation structure.

This project is more than an investment in our region - effective flood mitigation is a shared national concern. A structure that can withstand the forces of the Bay of Fundy is one whose operating principle can be scaled to be transferable to other locations across Canada and the world. This proposal represents how collaborative partnerships can provide safety and security to multiple communities and thus provide ongoing growth and sustainability. This is a tangible, proactive step toward dealing with climate change through a smart cities approach that will not only utilize but be dependent on connected technologies. The project demands innovative thinking and design. It is an

attainable 'dream big' undertaking, utilizing our unique geography as the structural framework to both generate renewable energy and address the very real threat to our region from rising sea level storm surges. We believe this bold project could make Canada a leader in the smart cities movement across the world, and ensure the survival of our region.

Question 5: Please describe how your community residents have shaped your Challenge Statement. Describe your plans for continuing to engage and involve them in your final proposal going forward. (1,500 words max)

Municipal governments represent the values expressed by their communities. Those values shape the goals and services of each municipal government. As small municipalities, council and staff enjoy close ties with community members, businesses, and stakeholders. There is a level of involvement and comfort for community members to voice their concerns that is not enjoyed to the same extent in larger municipalities. The small size lends to a form of informality that creates open dialogue for feedback from community members. Countless times, council and staff from all four municipalities have had residents, business owners, and action groups provide formal and informal feedback that identified the threat of storm surge and rising tides as a top concern affecting their sense of security and safety. They also identified the need for sustainability of the region which requires continued growth (social, cultural, and economic) but all the while protecting the quality and pace of life that is currently enjoyed. The Challenge Statement was created as a direct result of feedback received in the four municipalities.

Below are examples of how each municipality has engaged with community residents and stakeholders to determine that the Challenge Statement is a true reflection of the communities' feedback.

Town of Annapolis Royal: In 2016, The Town of Annapolis Royal began undertaking a review of its strategic plan. The first step in the process was to engage with town residents, stakeholders, and citizens from the surrounding area through three public town hall style meetings and a public survey that was offered online and in hard copy. The meetings were held at times when different demographics would be free to attend and in a central location that is accessible for all levels of mobility. The meetings and survey were largely promoted through social media, email distribution, the Town's website and newsletter, in addition to posters at various locations in town. One of the top concerns identified was the threat of storm surges and rising sea levels and the destructive potential they pose to the town and how this affects citizens' sense of

security. This fear extends to potential residents, exemplified by town hall having received inquiries from people wanting to move to the area but sea level concerns act as a deterrent. The feedback received has weighed heavily in the creation of the draft strategic plan. The theme of security as a result of the environment can be seen as a common thread throughout the document in multiple strategic areas and goals, vision, mission, and values.

Climate Change is a 'hot topic' in the region. Recently area residents and environmental leaders formed the Annapolis Climate Change Action Group. On March 19, 2018, council for the Town of Annapolis Royal passed a motion to establish the Environment Advisory Committee, whose mandate is to recommend proactive measures, educate, promote and provide feedback on environmental issues related to sustainability, advocacy, and stewardship within the town. This committee was created as a direct result of the strong voices in the community on the importance of taking proactive measures toward climate change. The committee is community member driven in addition to having a member of the Clean Annapolis River Project, a leading local environmental group, sit on the committee.

Municipality of the County of Annapolis: Citizen and stakeholder engagement was critical in the preparation of the 2013 Municipal Climate Change Adaption Plan (MCCAP). Storm surge causing coastal erosion and flooding and rising sea levels were recognized as being hazards that could damage infrastructure and affect long-term sustainability of the region.

Town of Digby: In 2009, the Town held Integrated Community Sustainability Forums. The public was asked to offer their input at two different public discussion forums; one directed toward climate change and the other toward economic sustainability. Storm surge protection, and to a lesser extent coastal erosion, where highlighted by the public, who also identified having a continued sustainable, growing economy as critical to survival. Sustainable transportation links were recognized as being critical to economic growth. This included maintaining the ferry link between Digby and St. John, New Brunswick.

Municipality of the District of Digby: The Municipality undertook Integrated Community Sustainability Planning in 2011/12 and MCCAP process in 2013. Both processes included public consultations. Residents consistently voiced their concern about climate change and specifically rising sea levels and the effect on critical infrastructure. Strong support was voiced for renewable energy sources in the region.

The importance of providing a platform to all voices in the development of this project is paramount. Very often the voices of the Indigenous populations are overlooked. We are committed to building a partnership with the Bear River First Nation, which lies within the Municipality of the District of Digby. Their citizens have been vocal that projects

such as the Nova Scotia Power Tidal Plant in Annapolis are detrimental to their beliefs and to marine life. If this project is to work, it must align with the ideologies of the indigenous population, the fishing industry, and citizens. A project of this magnitude cannot move forward without the participation, cooperation, and understanding of the existing resource users. The mayor of Annapolis Royal has reached out to the chief of the Bear River First Nations to enter into discussions and bring them on board as a partner.

Aside from a council motion to submit an application to the Smart Cities Challenge and discussion at municipal council meetings, public awareness of the application was presented through an article that appeared in the Annapolis Valley Spectator on March 15, 2018, in which the mayor of Annapolis Royal was interviewed. The article has been met with an overwhelmingly positive response and was widely shared across social media.

All four municipalities strive for transparency. Rate payers need to know and have a right to know that their money is being spent on building a safe environment for them to live and flourish. As such, community notifications and engagement would continue after being awarded the prize. Notification would be conducted through notices in regional and local print publications, discussion at council meetings so that there is a public record, and electronic mediums (website, Mail Chimp, social media). There would be a focus on open meetings to present to the public the plan for the Smart Cities Challenge project and offer them countless opportunities for input in shaping the final project. These meetings would be held in each municipality in multiple locations, on multiple dates and would be in locations which are fully accessible. Citizens would also be encouraged to provide written feedback to municipalities. This project is massive in its undertaking and is one that cannot be implemented without input and backing of its citizens, businesses, and stakeholders.

Question 6: Please describe your preliminary proposal and its activities or projects. (2,000 words max)

We wholly admit to this idea being one that is not fully fleshed out, even in the preliminary stages. This is due to the fact that the undertaking is one that requires such specified skills and knowledge. The project is heavily reliant on experts in a multitude of fields. This includes hiring appropriate engineers as project managers who have the responsibility of outlining the projects and activities required for the successful execution of the proposal. We envision some of the projects and activities to include the below. It is not an exhaustive list as we require expert input. Placing in the Top 10 of the Smart Cities Challenge would provide the opportunity to define a detailed list.

- Request for Proposals (RFPs) for engineers to act as project managers. They would be responsible for the delivery of tender packages/RFPs/feasibility studies, etc…
- Have the chosen project managers define detailed activities and projects
- Completion of feasibility studies: these include economic, environmental, regulation and standards, resource, and technical feasibility studies
- Public Consultation: Design and implementation of a communication strategy to notify the public and gain their input through meetings and surveys. This includes multiple stakeholders and users of the waterway.
- Identify options to address fiscal strategy for the successful implementation
- Completion of environmental tests
- Commissioning of engineering designs (this would include specific types of connected technologies)
- Engagement with experts
- Development of partnerships with private industry
- Appointment of staff to a project working group.

A positive upshot of our municipalities investing such enormous resources and capital into this project is that much of the work undertaken can be utilized by other regions across Canada. The safety and security offered by a viable flood mitigation system and the growth potential and sustainability offered by renewable energy are areas that interest and affect countless municipalities throughout the country. The knowledge gained, lessons learned, and the use of a variety of advanced connected technologies in making the project a smart cities model can be shared. This is a blueprint that is scalable to allow for replication, whether it is components or the entirety of the structure. This project is one that has a positive impact not just on community members of our region but as the project is transferable, it has positive outcomes for Canadians as a whole.

Question 7: Please describe the ways in which your preliminary proposal supports your community's medium and long-term goals, strategies, and plans. (500 words max)

As a rural area of Nova Scotia, resources have historically been somewhat more limited than larger and more populated areas. This has sometimes resulted in planning approaches that were not aligned with a smart cities approach. However, after so much public input that resulted in the theme of citizens feeling that their long-term sense of security is endangered by flood and economic threats, our leaders are striving to take giant proactive steps to assuage these fears. We are cognizant that a shift in approach is required if we are to achieve this goal. That shift is one that adopts a smart cities approach. It is the way forward to achieving a solution. This approach, citizen and stakeholder feedback, and our proposal align with the medium and long-term goals of all four municipalities.

Below are some of the medium and long-term goals that correlate to our proposal and embody the opportunity to embrace a smart cities approach.

Town of Annapolis Royal:

- Complete objectives and initiatives as identified by the Environment Advisory Committee and achieve milestones outlined in the Federation of Canadian Municipalities' Partners for Climate Protection program
- Ongoing transparency and communications with citizens, business owners, students, visitors, and other stakeholders
- Optimization of regional resources and shared services with various organizations, municipalities and other levels of government

Municipality of the County of Annapolis:

- Environment: community resilience, capacity, corporate mitigation, manageable environmental stewardship
- Asset integration with natural environment

Town of Digby:

- Identify technical resources and funding opportunities for the preparation of a coastal surge and erosion risk assessment and mitigation strategy
- Undertake the preparation of a coastal surge and erosion risk assessment and mitigation strategy for the Town

Municipality of the District of Digby:

- To reduce the threat of climate change impact on critical infrastructure
- To continue to develop renewable energy sources
- Mitigate climate change effects in coastal communities relating to sea level rise and erosion

Question 8: Please describe your community's readiness and ability to successfully implement your proposal. (1,000 words max)

In truth, this project is mammoth in scale and beyond the size of previous undertakings by the four municipalities. However, this is not a deterrent in the least for the involved parties. As small municipalities, council and staff are accustomed to setting stretch goals and meeting them with limited resources. Staff possesses a diverse set of skills in relation to completing complex infrastructure projects and is adept at working cohesively to achieve the expected end result. All four municipalities have strong financial controls in place, knowledgeable staff, and staff experienced at working with the community and multiple stakeholders as well as with other municipal units. We know that we possess the ability to succeed in any project undertaken. The skills and experience from other projects shape the backbone of our ability to carry out this proposal.

Regional partnerships between the municipalities and/or with other municipalities have been utilized for the provision of infrastructure projects and services. There is a strong history of successful completions of complex infrastructure projects such as sewage treatment facilities, sharing of water resources, and economic development projects that include the partnering of governments and private businesses. Projects of this nature require high level of cooperation from the political level to public works staff, engineering and tax collection and processing.

Each municipality is responsible for undertaking their respective capital projects (Annapolis County has in excessive of 100 outstanding capital projects alone) and are 'well-oiled machines' with organizational structures in place for infrastructure projects and administration of funds. With four communities involved in this project, there is a potential weakness in the area of communications. Ensuring that the parties involved (government and their community members) all have access to the information they need and are on the same page is vital. To address this potential weakness, a communication plan would be developed that would keep all four units up-to-date and manage communications with the public. A structure would be put into place that would see one government body act as the lead point on this project and all four bodies would appoint the appropriate staff to a project working group. The working group members would report to their Chief Administrative Officers who in turn would report to council. An outside engineering firm would be hired for the overall project management.

Buy-in to a project that is so far outside the comfort zone of many community members and stakeholders also presents a challenge but with a carefully crafted communication plan that relays the importance of sharing information and offering opportunity for input, it will be easier to gain support.

A smart cities approach is a newer approach for our municipalities but it is one which councils and citizens want to make the leap. As this is an area that our municipalities are not well acquainted with, we would reply heavily on experts. Technologies are advancing and this proposal offers the opportunity to employ a plethora of connected technologies and data to make our communities not just a smart city but a smart region.

Question 9: Describe your plan for using the $250,000 grant, should you be selected as a finalist. Provide a high-level breakdown of spending categories and an accompanying rationale. (500 words max)

The $250,000 would be an integral component of the execution of this project as it would allow us to engage with experts and source a workable design. Spending categories would include:

- Engaging and sourcing subject matter experts
- Creation of Requests for Proposals (RFPs) and development of feasibility studies and proposals. This would include economic, environmental, regulation and standards, resource, and technical feasibility studies
- Scenario modelling
- Commissioning of engineering specs of tangible proposals that can be used as a viable design solution
- Advertising of the RFPs (locally, regionally, nationally, and internationally)
- Professional project management services
- Community engagement – advertising, meetings, and other forums for citizens and stakeholders to offer input.

The intended flood mitigation and renewable energy source concept described is one in which the final proposal is not fully fleshed out. The final design will be revolutionary in its conception and requires inimitable engineering that is beyond the scope of the preliminary idea. As such, the $250,000 would be dedicated to activities that would source a final viable design. The above listed items are the high level activities that would lead to this outcome.

Question 10: Describe the partners that are or will be involved in your proposal. Where partners are not yet determined, describe the process for selecting them. (500 words max)

This is an exciting opportunity for establishing multi-lateral partnerships and having a variety of sectors collaborate on a project that will provide security and safety for generations to come. CAOs/Mayors and project managers will make the initial contact to develop the partnerships.

L'Sitkuk (Bear River) First Nation: The goal is to have them join in equity participation. If they determine that they do not want to pursue partnership, then we absolutely want them to have a voice at the table to offer input, address concerns, and ensure that the project is respectful of ideologies. The Town of Annapolis Royal has begun discussion with the L'Sitkuk (Bear River) First Nation regarding this project.

Private Sector Engineers: An outside engineering firm will be employed as project managers to oversee the procurement of associated feasibility studies and the procurement of design from outside engineers to create the actual structure. The RFPs would be issued at local, regional, national, and international levels with the project managers tasked with identifying the best resources through which to advertise the RFPs.

Subject Matter Experts / Academia /Research: Advice would be sought in a variety of areas - everything from geosciences, environmental issues, connected technologies, and clean energy sources to water control. Dr. Tim Webster, research scientist with the Applied Geomatics Research Group at Nova Scotia Community College, has offered his services as an authority. Holland is considered to be the leader in flood mitigation tactics. We would invite their leading experts to consult. Organizations involved in tidal energy research and other renewable energy solutions would be brought on board, including the Acadia Tidal Energy Institute, which conducts research and education of tidal energy that respects the environment. The Fundy Ocean Research Center for Energy, "Canada's leading research centre for in-stream tidal energy, located in the Bay of Fundy" and Offshore Energy Research Association, who conduct "research projects to improve technologies and applications for tidal energy in the Bay of Fundy and off the coast of France".

Government of Nova Scotia: A structure of this magnitude requires support at a provincial level. It necessitates having the provincial government lobby the federal government and financial contributions from the Province. The project working group will be responsible for identifying provincial funding streams. We will partner with the Province to ensure adherence to provincial legislation. Close working ties will be formed with the Departments of Environment, Fisheries and Aquaculture, Energy, Natural Resources, and Business.

Federal Government: The CAO for the Town of Annapolis Royal has reached out to the MP for West Nova, Colin Fraser, who has relayed verbal interest and support in principal

for the project. This type of project requires federal support, including financial and legislative adherence.

Environmental Groups: Examples include the Clean Annapolis River Project, municipal environment groups, and local organizations. They have specified knowledge of the intricacies of local environment.

Private Sector: Eventually a partnership will likely be developed with a private energy company. This will be part of the RFPs and end project development.

Question 11: (confidential annex):

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. (500 words max)

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 which question(s) the information provided in this section relates to.

SECTION 3: OTHER REQUIREMENTS

Question 12: Provide a 200-word summary of your preliminary proposal. You may also provide an image that represents your preliminary proposal.

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

Four municipalities are working collaboratively to have engineers create a pioneering piece of infrastructure that will offer citizens safety and security from the threat of storm surges. This will be accomplished through the creation of a flood mitigation system that will also encompass a renewable energy source. The flood mitigation component will have mobility, allowing for water diversion, regulation, and boat access and will remain

open with elements that can move into place when a threat looms. It will encompass the smart cities approach and be built on the foundation of connected technologies. The proposed location is the Digby Gut, a narrow water channel that is bookended by the Municipality of the County of Annapolis and the Municipality of the District of Digby. The Gut is where the Bay of Fundy, with the highest tides in the world, meets the Annapolis Basin. This project is not about mollifying Mother Nature but rather working with her to harness her power. As such, a possible type of renewable energy would be tidal energy. The Bay of Fundy has been identified as being one of the top locations in the world for tidal energy, with Digby Gut being a premier site.

Question 13: Provide a link to the online location where you will post the full version of your application.

Each municipality will provide a link from their website.

Town of Annapolis Royal: annapolisroyal.com
Municipality of the County of Annapolis: annapoliscounty.ca
Town of Digby: digby.ca
Municipality of the District of Digby: digbydistrict.ca

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.

Attached below.

Question 15: Please identify the point of contact for the application.

- Name: Amy MacManus
- Title and affiliation: Executive Assistant for the Town of Annapolis Royal
- Phone number: 902-532-2043
- Email address: admin@annapolisroyal.com

Question 16: Read the Privacy Notification, Consent and Release form, and Communications Protocol and indicate your agreement.

SECTION 4: SURVEY QUESTIONS

Question 17: Please provide the following information about your organization.

- 2017 full-time equivalents (FTEs):
  - Number of total FTEs
    - Town of Annapolis Royal: 13
    - Municipality of the County of Annapolis: 44
    - Town of Digby: 20
    - Municipality of the District of Digby: 20
  - Percentage of total FTEs devoted to innovation
    - Town of Annapolis Royal: 0%
    - Municipality of the County of Annapolis: 0%
    - Town of Digby: 0%
    - Municipality of the District of Digby: 5%

- 2017 operating and capital budgets:
  - Total operating budget
    - Town of Annapolis Royal: $1.9 Million
    - Municipality of the County of Annapolis: $24,324,345
    - Town of Digby: $3,747,879
    - Municipality of the District of Digby: $8,708,154
  - Percentage of total operating budget devoted to innovation
    - Town of Annapolis Royal: 0%
    - Municipality of the County of Annapolis: 0%
    - Town of Digby: 0%
    - Municipality of the District of Digby: 10%
  - Total capital budget
    - Town of Annapolis Royal: $1.5 Million
    - Municipality of the County of Annapolis: $18,098,414
    - Town of Digby: $831,595
    - Municipality of the District of Digby: $764,500

- Percentage of total capital budget devoted to innovation
  - Town of Annapolis Royal: 0%
  - Municipality of the County of Annapolis: 0%
  - Town of Digby: 2.4%
  - Municipality of the District of Digby: 25%

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.

- **Economic opportunity**
- Empowerment and inclusion
- Environmental quality
- Healthy living and recreation
- Mobility
- **Safety and security**

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.

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

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.

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

Letter of Support for the Smart Cities Challenge

Please accept the Smart Cities Challenge application from the undersigned regional partners, who have come together in an effort to ensure a safe and secure future for their citizens, preservation of shared rich histories, and the economic sustainability of their communities and the region.

The regional partners have proposed an ambitious project, that they believe is achievable - and which has the potential to make Canada a global leader in the smart cities movement.

Utilizing our unique geography as the structural framework upon which to defend our region against rising sea level storm surges, the undersigned envision a pioneering piece of infrastructure that would at the same time harness the power of the highest tides in the world to generate renewable clean energy for our region and province.

William MacDonald
Mayor, Town of Annapolis Royal

April 23, 2018
Date

Ben Cleveland
Mayor, Town of Digby

April 23 2018
Date

Timothy Habinski
Warden, Municipality of the County of Annapolis

April 24 2018
Date

Jimmy MacAlpine
Warden, Municipality of the District of Digby

April 23, 2018
Date