



**City of Kingston
Report to Council
Report Number 18-162**

To: Mayor & Council
From: Gerard Hunt, Chief Administrative Officer
Resource Staff: Craig Desjardins, Director, Office of Strategy, Innovation & Partnerships
Date of Meeting: June 26, 2018
Subject: Mid-Year Update: Smart City

Executive Summary:

In the Smart City Update Report (18-012) dated December 17, 2017, Council received details of the progress across the City and Utilities Kingston (UK) on smart, innovative initiatives realized in 2017 and was provided with a vision and framework for a Smart Kingston strategy.

Over the first six months of 2018, significant progress has been made to advance a smart, livable, 21st century city at a corporate, community and regional level. Within the City and UK, exciting partnership development had occurred to further develop Smart Kingston strategy implementation. Collaborations with private sector firms such as Bell Canada, Telus and IBM Canada, among others, are at various stages of development. Expanding collaborations with post-secondary education partners, Queen's University and St. Lawrence College (SLC), are also growing through improved linkages of departments, research centres and institutes, notably in the healthcare sector.

Much of the progress on smart cities is directly attributable to the development of an application for the Government of Canada's Smart Cities Challenge Fund program. Kingston's proposal sought to tackle isolation by reimagining social, digital and physical connectedness to foster a healthy, resilient, and engaged community by focusing on the specific challenges of older adults. While [Kingston's submission](#) was not selected as a finalist, the network of partners created will allow the City to continue to expand smart cities initiatives.

Within the City and UK, a number of new applications and projects are being developed to make the lives of residents better and improve the efficiency of municipal operations including:

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- Last month, UK was recognized nationally as a centre of excellence for its development of a first-of-its-kind process to support safe, distributed electricity generation using fibre optics.
- The City's IS&T and GIS departments are preparing the launch of a new public data mapping app called My Neighbourhood that visualizes city data including the location of parks, schools, libraries and fire stations as well as showing details of permit and development applications on a smartphone or tablet. The new app is expected to be available by late fall 2018.
- The recently funded Workforce Data Analytics Pilot is a platform to provide support to jobseekers, workers, and employers by promoting a thriving workforce in Kingston through Artificial intelligence and cognitive computing and was developed by collaboration between the City, Queen's Centre for Advanced Computing, IBM and SLC.

At a regional level, the City recently supported an investment in cellular infrastructure through the Eastern Ontario Cell Gap and Capacity Expansion Project (Report 18-126) to fix holes in cell coverage to allow expanded capacity for more customers and more IoT devices.

One of the underlying threads of all of the smart city and innovation activities that have been described in this report is the connective infrastructure of broadband. Without state-of-the-art, accessible and affordable access to the internet for residents and businesses, the longer-term economic and social potential of the Kingston community will not be realized.

Council has previously identified connectivity, specifically wi-fi deployment, as a priority for City involvement. Additionally, City leadership in fibre optic internet access began in 1998 with the creation of UK's Fibre Networking business. The Kingston community is in an enviable position of having its own successful fibre networking operation that provides fibre optic access to the broader public sector, industry and private internet service providers. It must now create a strategy to harness this competitive advantage.

In order to move forward, a broadband strategy must be developed that will enable the deliberate planning and development of equitable access to broadband across Kingston. The strategy will create a baseline of current services for fibre optics (public and private sector systems), cellular/mobile network coverage and public wi-fi access. The strategy will then establish an aspirational target for broadband coverage in Kingston and lastly develop a plan to achieve the targets proposed. It is proposed that this work be carried out of behalf of the City by Utilities Kingston given their significant experience in the fibre optics business, strong industry relationships and leadership and management experience in executing projects.

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Recommendation:

That Council receive the Mid-year Update on Smart Cities activity, and;

That Council authorize a budget amendment of \$100,000 from the Working Fund Reserve for the development of a broadband strategy for Kingston, and

That Utilities Kingston be engaged to undertake and deliver the broadband strategy to be used for future strategic planning purposes.

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Authorizing Signatures:

ORIGINAL SIGNED BY CHIEF ADMINISTRATIVE OFFICER

Gerard Hunt, Chief Administrative Officer

Consultation with the following Members of the Corporate Management Team:

Lanie Hurdle, Commissioner, Community Services	Not required
Jim Keech, President & CEO, Utilities Kingston	√
Desirée Kennedy, Chief Financial Officer & City Treasurer	√
Denis Leger, Commissioner, Corporate & Emergency Services	Not required

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Options/Discussion:**Progress to Date in 2018**

The first half of 2018 has been a busy time for smart city initiatives. This began with a deliberate change this year in referring to our smart city initiatives under the Smart Kingston tag line. This is an important change as it helps to reinforce the fact that we have a smart city plan that is distinct and made uniquely for Kingston. Several of the major developments in 2018 are detailed below.

Smart Cities Challenge Fund Application

The City of Kingston applied to the Smart Cities Challenge Fund run by the Federal Government in April 2018 (Exhibit A). Details on the Smart Cities Challenge were provided to Council in Report 18-102. While the City of Kingston was not chosen as a finalist in the competition; there were a number of positive outcomes from development of the application.

An application team was established that was resourced from a variety of departments across the corporation, and Utilities Kingston. This team came together quickly and immediately started working to develop a project concept, engage the community, and complete the application process. The cross departmental collaboration between the CAO's Office, IS&T, Communications, and Utilities Kingston was new and delivered strong results. This process can be considered a template for future opportunities.

An important component of the Smart Cities Challenge Fund application was ensuring that the Kingston community had a chance to provide feedback and input into the project. The project team was able to engage the community through the Get Involved Kingston platform. This platform was used to have members of the community complete a survey that the application team used as input into the application's development.

To further engage with the community a consultation session was held at the Utilities Kingston office. This consultation brought together representatives from Utilities Kingston, Queen's, St. Lawrence College (SLC), the Limestone District School Board, community leaders, IBM, ESRI Canada and Bell Canada. The consultation involved presentation of the project concept and solicitation of feedback from the participants.

As a start to public engagement on Smart Kingston, the Smart Cities Challenge Fund team surveyed residents about their connectivity to each other and the community. Results were used to further validate the premise that some in the community were less connected than others and supported the pilot project themes being put forward.

Kingstonians overwhelmingly identified a caring, equitable and connected community as their most important priority for a smart Kingston with public/free Wi-Fi access frequently mentioned as a solution. Green and sustainable outcomes were often seen as synonymous with smart cities outcomes. Results were run through IBM's Watson Sentiment and Tone Analytics Tool with a strong, positive sentiment of joy for the Kingston community.

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Other results from the survey include:

- 84% of the respondents view transportation and mobility as the biggest opportunity to improve connectedness.
- Respondents rated work and social connectivity as their biggest challenge (25.8%), followed by transportation and mobility (22.5%).
- 30% of respondents (who connected through the digital survey) felt that they were disconnected to others due to lack of social and physical connectivity
- 22.5% of the respondents felt they could only contact two or fewer people in case of an emergency.
- Internet access (digital connectivity) is the most important service that keeps respondents connected to the community.

Partnership Development

The first half of 2018 has seen a number of parties external to the municipal corporation interested and involved in our Smart Kingston activities in particular through the Smart Cities Challenge application process.

➤ **Bell IoT Initiative**

The collaboration with Bell Canada as outline in the Report to Council ([18-053](#)) has begun to take shape with the facilities and energy management and kiosks projects as the first to be developed. Staff is working with counterparts at Bell Canada and with community partners such as Tourism Kingston to ensure value for money and world-class outcomes.

➤ **IBM Canada Collaboration**

Over the past nine months, the City and Queen's University, through the Centre for Advanced Computing, have been forging a new collaborative partnership with IBM Canada's Centre for Advanced Studies. The IBM Advanced Studies team facilitates research, technology and design collaboration within the IBM Canada Lab. The facility currently supports 51 joint academic-industry research projects associated with 73 different IBM products, involving 100 staff, 45 faculty and 80 graduate students. These product-based research efforts are complemented by discovery projects involving social, economic, cultural, environmental and technological challenges centred on communities, education and health. The City of Kingston, in partnership with the Centre for Advanced Computing (CAC) at Queen's University, has been identified as particularly well-aligned with these projects and could very effectively deliver support for true social innovation in the public sector.

What is envisioned through this partnership is a future where the development, infrastructure, data hosting and analytical capabilities of Queen's and IBM are employed to support social innovation in Kingston and in municipalities in Eastern Ontario and across the country.

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IBM's contribution to the partnership includes:

- Funding for Research Assistantships from post-secondary education institutions for the City of Kingston.
- Graduate Studies Fellowships with Queen's University to support thesis research in areas of social innovation of interest to the City of Kingston.
- The facilitation of IBM Design Thinking services to the City of Kingston and other interested community partners to build design thinking skills by participating in workshops.
- The selection of St. Lawrence College (SLC) as a host for the IBM Skills Academy program. The IBM Skills Academy program is a new career-based education partnership that offers industry resources and certifications. The partnership will provide SLC with access to over fifty hours of industry-validated content in each of 16 career-based education streams in the Information, Communications & Technology (ICT) field.
- Leveraging other collaborations and facilitating connections to other relevant IBM relationships in eastern Ontario and across Canada, including the Institute for Data Science and the Centre for Urban Research and Education at Carleton University, and the Centre for Business Analytics & Performance at the University of Ottawa.

➤ **Workforce Analytics Pilot Project**

With external funding for the 2018/2019 fiscal year, the Workforce Data Analytics Pilot project is a collaboration between the City, Queen's, IBM and SLC to develop a platform to gain valuable new insights into Kingston's labour market. The Workforce Data Analytics Pilot is being developed to provide support to jobseekers, workers, and employers by promoting a thriving workforce in Kingston with the following deliverables: the collection of historical and current, local supply and demand labour market data, to develop an intelligent job matching application using tools including artificial intelligence, running descriptive analytics on the data gathered to better understand the Kingston job market, available skills, and employment trends, and applying evidence-informed analytics on the data to predict future skills shortages and identify possible cost-effective methods of allocating resources to overcome the skills shortages. Artificial intelligence and cognitive computing will be used as part of this exciting initiative.

➤ **Speaking Engagements**

City of Kingston staff has been invited to speak and participate in several conferences and events across Ontario. Each of these represents an opportunity to share ideas, learn from others and increase the visibility of Kingston's Smart City activities. Recent events include:

- Speaker at IBM CASCON Conference
- Presented Customer Experience Strategy at Municipal Information Systems Association (MISA) 2018 Conference

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- Invited to sit on Citizen Engagement expert panel at MISA 2018 Conference
- Speaker at SLC Innovation in Analytics with Data & AI
- Speaker and host at Eastern Ontario Data Roundtable

➤ **Mayor's Innovation Challenge**

The inaugural Mayor's Innovation Challenge held this past spring saw student teams from SLC, Queen's and Royal Military College (RMC) compete for summer internships by developing innovative proposals to address a number of challenges faced by the City of Kingston. Through the generous support of Bell Canada, the Queen's Centre for Advanced Computing, the Queen's Centre for Social Impact and the Dunin-Deshpande Queen's Innovation Centre (DDQIC), the City received 11 proposals with 6 teams pitching their ideas to a panel of judges. Two student teams won internships with the City.

➤ **Launch of New Open Data Portal**

The City continues to invest in our Open Data Program. In 2018 a new open data portal – Open Data Kingston – was launched. Through past and current work, the City continues to demonstrate a strong commitment to the principles of open government, transparency and innovation. With a renewed focus on user experience and citizen engagement, the City has established a platform for the future that removes many technological and data availability barriers for a wide spectrum of users.

As part of the portal development, the City has adopted industry standard data categories or “themes” (ISO 37120) and continues to work with data owners to publish new data on a quarterly release cycle. Our priority is to publish data that is aligned to support transparency and innovation (e.g. Smart City Challenge, Mayor's Innovation Challenge) that is focused more on quality than sheer quantity of datasets. By the end of 2018, we expect to see financial, governance and service request data available on the platform, with environment related data to come in 2019.

As we work to add datasets to the portal we are updating community-oriented communication and outreach plans. Regular feedback is very important to ensuring the platform is meeting desired goals and expectations.

➤ **Eastern Ontario Open Data Forum**

The City and the World Council on City Data (WCCD) co-hosted the Eastern Ontario Municipal Data Roundtable in Kingston on May 24, 2018. The Roundtable was convened under the Open Data for Ontario Municipalities Initiative supported by the Ministry of Municipal Affairs and explored the rapidly growing opportunities and benefits of standardised open data for Ontario Municipalities and their citizens. Ten Eastern Ontario municipalities were represented plus representatives from Queens, SLC, and the Eastern Ontario Regional Network (EORN). Discussions were focused on the new IOS 37120 designation for sustainable cities and communities with indicators for city services and quality of life.

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➤ **Development of new public portal, My Neighbourhood, for data mapping**

The new My Neighbourhood application is a tool for residents to locate public facilities, assets, services and activities in our community. The highly user friendly app can be accessed 24 hours a day, seven days a week from a smartphone, tablet, or desktop computer and will use existing data city sets including location of parks, schools, libraries, fire stations and community centres. It will also show where permits and development applications are being submitted and will supplement customer service representative information provision. There is incredible potential for additional data layers/information to be added as new data sets are brought into the ARC-GIS geo-spatial system of the City. The My Neighbourhood app is currently being beta tested and is anticipated to be launched to the public in Q3 of 2018.

➤ **Utilities Kingston Recognized as Centre of Excellence**

Last month, the Canadian Electricity Association (CEA) recognized Utilities Kingston as a Centre of Excellence for its development of cutting edge technology processes that enables safe, distributed electricity generation across the Kingston community. Utilities Kingston's multi-utility structure (electricity, water, wastewater, natural gas and fibre network) has allowed employees to collaborate across utilities enabling the development and implementation of an important new application and safety protocol.

With the electrification of transportation, by both the City and its residents, and the need to reduce greenhouse gas emissions, increased demands are being placed on the electricity grid. By collaborating across its fibre optic networking, SCADA, and engineering groups, Utilities Kingston has developed a first-of-its-kind approach to transfer trip communications, remote monitoring, and control that takes place over its fibre optic network versus traditionally copper wires thereby increasing reliability, bandwidth and speed, while also incorporating new features such as system monitoring.

➤ **Regional Cell Gap Investment**

In May of this year, Council supported an investment in connectivity infrastructure outlined in the Eastern Ontario Cell Gap and Capacity Expansion Project Report ([18-126](#)). The Cell Gap and Capacity Expansion Project is designed to fix "holes" in cell coverage which will allow "capacity" challenges to be addressed that result from more people and more devices in concentrated areas competing for access to the cellular network. This investment will be an important component of the Smart Kingston strategy as the growth of IoT devices continues.

Residents and visitors alike expect access to fast, reliable internet connectivity. This can take the form of fixed (typically fibre) for their home or work, mobile voice and data connectivity for access to information and apps via the cell network; and Wi-Fi for offloading data consumption from their mobile plans. Ubiquitous mobile/cell coverage and ubiquitous Wi-Fi coverage go hand in hand and complement each other for access to information and data.

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Next Steps

Development of a Broadband Strategy

Broadband refers to any high speed connection to the internet. The City of Kingston has long recognized that broadband access is an important service to deliver for economic and community development in Kingston. The City has demonstrated this importance by establishing a networking business owned and operated by Utilities Kingston that provides world-class broadband access to businesses in Kingston, Brockville, and Napanee.

The Smart Kingston initiatives described in this and previous smart city report demonstrates the value- current and future of connecting the Kingston community, and helping to continue to build on our reputation as a connected community. However, for Kingston to become a national and global leading city, a Smart Kingston must be built on the foundation of connecting our residents and community, not just our businesses. It is time for a comprehensive Broadband Strategy for Kingston.

A Broadband strategy will enable the deliberate planning and development of equitable access to broadband across the city of Kingston. The strategy will consist of three major components of work:

1. Establish a baseline.

- a. We will move past anecdotal evidence and generate real, quantifiable, open data on what broadband services are available across the City of Kingston.
- b. This baseline will document real world broadband access speeds, service providers, and barriers to broadband access.
- c. The baseline data will be made available to the community and will be used to measure progress on increasing availability annually.

2. Establish a Target for the City of Kingston

- a. We will establish a minimum target for Broadband services in Kingston. The minimum service level the Canadian Radio and Telecommunications Commission (CRTC) defines for broadband is 50Mbps Download, and 10Mbps Upload. Kingston will establish an aspirational target for our community in this regard as well as a target for increasing the coverage in the community.

3. Establish a plan to Achieve the Targets

- a. We will build a plan to bridge the gap in Broadband services in Kingston.
- b. We expect to work with Utilities Kingston, private service providers, the Eastern Ontario Regional Network, and other partners to facilitate infrastructure required to bridge the gap.

The deliberate process detailed here is something that will make Kingston unique in Eastern Ontario, and will be something that can be used to further promote the Kingston brand.

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Utilities Kingston will complete the work associated with establishing the baseline and engage a broadband experts to deliver the remainder of the report. UK is ideally suited to lead this strategy development on behalf of the City given their significant experience in the fibre optics business, strong industry relationships and leadership and management experience in executing projects.

Data Security & Privacy

There is a critical societal need to embody the highest levels of security and privacy of data when dealing with network-connected devices and cyber-physical systems such as those employed in the Smart Kingston projects. Kingston will employ the latest Threat Risk Assessment (TRA) techniques, including new research coming out the National Institute of Standards and Technology (NIST) sponsored Smart and Secure Cities and Communities Challenge (SC3), to ensure that our residents and their data remain safe, secure and protected while enjoying the benefits of the innovation and technology. These techniques will be shared and embodied as best practices going forward. A number of data privacy models are being investigated as part of the work being done with Smart Kingston including:

General Data Protection Regulation (GDPR) & Privacy By Design

The General Data Protection Regulation (GDPR) is a framework adopted by the European Union that came into force in May 2018 and has been the subject of considerable news coverage. The GDPR is a framework for protecting privacy while online. The framework is new in that its approach is very consumer focused, instead of industry focused. The basis of the framework was the "Privacy by Design" philosophy. Privacy by design is a concept that a former Canadian Privacy Commissioner developed. The basic principle is that by default, your private information should be kept private and not shared.

The importance of GDPR is that it is the first big step toward protecting private information online, and including fines for companies that do not.

This is an important regulation to be aware of; as the widely held belief is that the principles behind the GDPR will start becoming adopted around the world. The Smart Kingston team is monitoring this framework and working with City IS&T staff to be prepared for any changes that may affect our plans as the federal and provincial governments works towards a Canadian data policy.

Advancing Corporate Innovation

As part of focus of the Office of Strategy, Innovation and Partnerships, preliminary work is underway on a corporate innovation strategy for the City. Efforts are currently focused on documenting innovation best practices in the municipal and public sector but also at the private sector. Models and frameworks of organizational innovation that use design thinking and lean or agile processes will support the identification of problems and barriers and the creation of tactics and programs to create an exceptional organization. Examples of potential tactics include an interdepartmental innovation working group, innovation training programs in design thinking, staff innovation awards and a municipal solutions lab.

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Smart Kingston Outreach

As mentioned previously, Smart Kingston is the local strategy to help evolve Kingston's economy and compete in the digital economy. The Smart Kingston team is working with a Canadian expert in smart/intelligent cities to provide insight into global best practices, and guidance on developing our roadmap. This body of work will form an important input into our plans moving forward. The Smart Kingston team is also working on establishing a plan to engage the community and get others involved. We expect to begin this community outreach in the second half of 2018.

Existing Policy/By-Law:

None.

Notice Provisions:

None.

Accessibility Considerations:

None.

Financial Considerations:

The funding request of \$100,000 in this report is a one-time cost to develop a broadband strategy for the community. As a one-time cost it is within the policy of the Working Fund Reserve. The funding will be administered through the Office of the CAO in partnership with Utilities Kingston to deliver the strategy.

Contacts:

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Other City of Kingston Staff Consulted:

Jeff Bumstead, Chief Information Officer

Kevin McCauley, Director, Networking, Utilities Kingston

Phil Healey, GIS Manager, Information Systems & Technology

Exhibits Attached:

Not applicable.