



**City of Kingston
Report to Council
Report Number 18-053**

To: Mayor & Council

From: Gerard Hunt, Chief Administrative Officer

Resource Staff: Craig Desjardins, Senior Manager, Innovation & Institutional Partnerships
Jeff Bumstead, Chief Information Officer

Date of Meeting: February 6, 2018

Subject: Bell Canada Internet of Things (IoT) Proof of Concept Partnership Proposal

Executive Summary:

Building on the City's vision of becoming a smart, livable, 21st century city as presented in the Smart City Update Report (18-012) received by Council in December, innovation in municipal service delivery is a main element. The City has been approached by Bell Canada with an opportunity to support the advance of smart city initiatives through the testing of new technologies in municipal and community settings. This partnership, if approved, will be the first of its kind to be implemented in Canada. Kingston has a history as an innovative community, and with smart city initiatives, including its success in the 2014 Intelligent Community Forum (ICF) competition where the City placed in the top 7 smart cities in the world.

This partnership "Proof of Concept" proposal is recognition by Bell Canada of the City of Kingston's leadership in innovation, dynamic and forward-thinking ecosystem and the investment that Bell Canada has made and continues to make in our community. The shared goals of the collaboration are the use of smart technologies to attract new businesses, highly skilled residents and visitors to the community while creating new revenues, reducing municipal costs, lowering GHG emissions and providing better service to residents.

In the recently released provincial long-term infrastructure plan, "Building Better Lives", the Ministry of Energy highlighted the need for all levels of government to embrace disruptive technologies through improved connectivity. This includes not only broadband infrastructure, but also smart, Internet of Things (IoT) enabled systems, buildings, roads and equipment that can

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be platforms for the collection of data which will make Ontario more globally competitive and improve the lives of all Ontarians.

The new provincial infrastructure plan aligns well with a number of City priorities and plans (smart city, climate action plan, strategic plan and Official Plan) that seek to stimulate economic growth, promotes social inclusion, strives to improve access and quality of public services and create resilience to the impacts of climate change.

There is significant potential in the proposed Bell Canada collaboration to advance smart infrastructure through enhanced real-time data capture and analytics that supports increased efficiency of municipal service delivery and helps the community reduce the environmental impact of assets (buildings, roads and vehicles).

The focus of this new model of collaboration is the development, testing and implementation of IoT and smart city solutions. IoT is the interconnection, through the internet, of computing devices embedded in machines and infrastructure, enabling them to send and receive data. This data can then be used to action and support decision making.

This IoT "Proof of Concept" process would see challenges that have been identified by municipal staff and community partners connected to potential solutions in partnership with Bell Canada. These solutions/innovations would be tested in the field for a period of up to six months, evaluated and, if successful, potentially implemented both here and throughout Canada. The proof of concept cycle may then begin again with new IoT solutions. The proof of concept cycle approach is proposed to ensure that implementation is manageable, affordable and relevant to the challenges that are being faced in our community.

The City of Kingston's obligation in this collaboration includes providing staff resources to liaise with Bell Canada's project team to coordinate with contractors and City stakeholders to ensure a seamless and successful testing ground of the IoT pilot solutions. The City will help in implementing the scope of the pilot solutions, promote the opportunity of the Smart City IoT pilot throughout its departments and work closely with Bell Canada to shape valuable actionable data. Budget for IoT solutions will come from within existing department budgets.

Bell Canada commits to implement, manage and maintain the solutions through a Bell Smart City Platform, support all elements of the pilot IoT solutions, act as Implementation Project Manager for all IoT solutions on behalf of the parties, bring in mutually agreed to third parties to install all IoT Solutions and have the data feeds integrated into the smart city platform, deploy and integrate all IoT solutions as part of the pilot Proof of Concept partnership. Bell Canada will provide substantial financial support for every dollar invested by the City.

The agreement will be developed to clearly delineate roles, outcomes, measurements, financial responsibilities and mechanisms for dispute resolution. The City is entering the pilot proof of concept partnership agreement with the aim of obtaining valuable information and other deliverables which may be used, in turn, in the near future in next stage procurements both on the open market and under further research arrangements. At this time, this pilot agreement does not include Utilities Kingston and its fibre network operations.

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Recommendation:

That the Mayor & Clerk be authorized to sign a Pilot Smart City Proof of Concept Agreement with Bell Canada subject to the satisfaction of the Director of Legal Services, and

That Council direct staff to provide a progress update at the end of 2018.

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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 applicable
Desirée Kennedy, Chief Financial Officer & City Treasurer	√
Denis Leger, Commissioner, Corporate & Emergency Services	Not applicable
Mark Van Buren, Acting Commissioner, Transportation & Infrastructure Services	Not applicable

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Options/Discussion:

Rapid technological change and the associated development and integration of smart city solutions for government are creating the need for new models of collaboration between the public and private sectors that reflects partnership rather than vendor/customer relationship. For Kingston, this “research & development” or “proof of concept” process takes advantage of the city’s tight-knit, smaller community with industry, post-secondary education and government working collaboratively to unlock value for social good. The Kingston community has frequently been a test market for different sectors.

Bell Smart City Platform

The foundation of the collaboration between the City and Bell Canada is a new Smart City IoT Platform. For municipalities, critical information is often stored in disparate systems across disconnected departments, hindering a clear view of the operational activity and increasing the difficulty of coordinating department efforts. Without a single, integrated view of data, events or incidents, and without the ability to rapidly share information, a municipality is less able to effectively deliver services in a sustainable fashion, protect citizens or drive future economic growth.

The platform is designed to address these challenges. It offers integrated data visualization, real-time collaboration and deep analytics that can help City departments prepare, coordinate and manage response efforts and enhance the ongoing efficiency of City operations. Bell Canada’s Smart City Platform is a cloud hosted integrated solution that combines:

- Sensor data from IoT solutions
- Automated Analytics
- Open data
- Social media sentiment data
- City provided data sets

The platform integrates independent systems providing visibility into an overall City level, and underlying departments’ status, and helps optimize operational efficiency. The platform offers the following features:

- Share Information: Integrate data sources in near real-time to create multifaceted situational awareness of City resources. For example, through the platform, road hazards can be shared with Emergency Services, Transit and Construction crews to reduce traffic flow through those areas;
- Status Dashboard: Use of the dashboard to view city conditions and assess critical issues quickly;
- Configurable Reports: User configurable reporting capability allows users to set up reports to gain insight into decision grade information captured by the platform;
- Role based access: Configure custom views and reports based on who is logged in;
- Analyze performance: Create predictions based on historical data and identify new patterns using advanced analytics. For example, generate quick insights on how changing weather conditions will impact energy consumption of City buildings;

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- Social media analysis: View and analyze citizens' social media sentiments regarding City plans and operations;
- Manage across departments and coordinate actions: help City departments collaborate;
- Notify appropriate responders and stakeholders with a personalized notification system and automated actions. Standard operating procedures (SOPs) ensure no steps are missed.

Benefits of the Smart City Platform

There are a number of benefits for both the City and residents of the platform and the related IoT solutions including:

- Reduce complexity in managing multiple IT and IoT systems by simplifying multi-vendor solution management. For example, the Facilities Management & Construction Services department uses a number of vendors for energy management. The platform could allow staff to view and manage multiple vendor solutions from one interface;
- Save time by generating automated reports on cross-departmental insights instead of relying on manual collection of data from individual departments and then spending time to consolidate all the collected data;
- Improve efficiency by facilitating communication, coordination and sharing data between departments;
- Reduce response time by using SOPs (Standard Operating Procedures) to trigger alerts and actions automatically when events occur;
- Reduce the need for technical assistance from dedicated IT staff through the use of user configurable KPIs, rules, workflows, and reports for specific environments;
- All the benefits of a Software-as-a-Service (SaaS) model with the platform such as future scalability, updates across the platform in near real-time and consumption in a multi-device manner.

Bell Canada is also interested in partnering with the City to support the development of an application to the Government of Canada's Smart City Challenge Program. With tangible results from the proof of concept pilot and leverage private sector expertise and resources, the City of Kingston will be in a strong position to develop a proposal that demonstrates tangible actions and learnings resulting from partnership.

Alignment with City Strategic Priorities

As a component of Kingston's smart city strategy, collaborations with private sector partners like those being proposed in this report align extremely well with a number of strategic priorities and goals of the City. These include:

- **Smart Economy**
This initiative clearly demonstrates the City's leadership in innovation. As one of the first Canadian municipalities to engage in this form of collaboration, Kingston sets itself apart in the municipal sector. This partnership can be used to further support the brand development of both the City and the community as a smart, livable, 21st century city. As mentioned earlier in the report, there is the opportunity to use the learning from the

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project to inform the development of funding applications like the Government of Canada's Smart City Challenge Fund.

- **Open Government**

The goal of customer service excellence is an important benefit of many smart city/IoT solutions. Residents now expect technology tools to be accessible in our community and staff needs support to provide more responsive service. IoT/smart city solutions also support the goal of greater transparency and citizen engagement by providing improved access to data and information and the platform to visualize this content.

- **Green City**

A number of potential IoT solutions that could be deployed as part of this project support the reduction of GHG emissions, particularly related to facility energy management.

Potential Pilot First Round Project Initiatives

As described earlier in this report, a cycle of testing solutions will take place every 6 months. Two projects that are being developed for introduction this spring include:

- **Facility Management Solution**

Working with the Facilities Management & Construction Services department, an integrated platform for management of systems like energy and security will provide financial savings, reduced GHG emissions and enhanced productivity of staff through better coordinated maintenance.

- **Digital Smart Kiosks**

Dual 55 inch touch screen video kiosks with embedded cameras, public Wi-Fi service, access to wayfinding, educational and tourism content, USB charging, 911/emergency calling features all support citizen well-being, communication and marketing. Tourism Kingston has expressed an interest in participating in this component.

- **Others** as may be determined through the pilot

Legal and Security Considerations

Data Security

The City of Kingston will control and own all data collected during the Proof of Concept partnership including any modifications, improvements, and derivatives of such data. The data is confidential and will not be disclosed or made available unless approved by the City of Kingston. At the end of the Proof of Concept pilot, all data collected or derived from data collected as part of the Proof of Concept will be returned to the City of Kingston and expunged from any network or storage device on which it was stored as part of the Proof of Concept. At all times the Proof of Concept solution and related technologies must be compliant with all applicable privacy legislation including MFIPPA. As the City controls all derivatives, the City will be free to pursue any future commercial applications with the broader commercial marketplace and not just Bell Canada.

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Network Security

Bell Canada has taken a number of steps to ensure the security of their networks. A dedicated team of security professionals focus on wireless network security and is tightly integrated into Bell's product and service rollout plans and Corporate Security Governance framework. As such, there are multiple levels of security within the Bell cellular network infrastructure including, but not limited to:

- Device and/or USIM security authentication mechanisms
- Secure access to Bell locations/cell sites
- Change control validations/processes/policies
- Network monitoring tools/applications/audits

Bell Canada adheres to a number of international security standards and frameworks, including Payment Card Industry (PCI) Data Security Standard and Information Security Forum Standard of Good Practice. Bell takes a proactive approach to information security. The City of Kingston's Information Systems & Technology (IS&T) department has reviewed this protocol and is satisfied that it addresses any concerns which might arise.

The proposed Bell Canada collaboration is an exciting opportunity for the City to:

- Advance the goals of the smart city strategy including providing better service to the public, improved inclusion and access to technology and finding efficiency and financial savings in service delivery
- Build stronger partnerships and linkages with private sector firms with the potential to increase the diversity of our economic base and stimulate employment and economic growth
- Demonstrate the authenticity of our innovation brand and agenda

It is anticipated that this collaboration will spawn new relationships with post-secondary education institutions who are now meeting with Bell Canada to investigate research opportunities and talent recruitment. There is also the potential for local tech startups to work with Bell to develop IoT solutions.

Existing Policy/By Law:

Kingston's Strategic Plan 2015-2018

Notice Provisions:

There are no notice provisions with this report.

Accessibility Considerations:

There are no accessibility considerations with this report.

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Financial Considerations:

Costs associated with the City's share are included in the 2018 approved budgets.

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Other City of Kingston Staff Consulted:

Corporate Management Team

Susan Nicholson, Director of Legal Services and City Solicitor

Alan McLeod, Senior Legal Counsel

Speros Kanellos, Director, Facilities Management & Construction Services

Luke Follwell, Director, Recreation & Leisure Services

Exhibits Attached:

None