



**City of Kingston  
Report to Council  
Report Number 15-386**

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**To:** Mayor & Council

**From:** James Keech, President and CEO, Utilities Kingston  
Gerard Hunt, Chief Administrative Officer

**Resource Staff:** Kevin McCauley, Director, Measurement & Communications, UK  
David Johnston, Chief Information Officer

**Date of Meeting:** October 20, 2015

**Subject:** Smart City/Intelligent Community Progress Report

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**Executive Summary:**

Council established priorities for the 2015-2018 term around a vision for a smart and livable city. In the implementation report (15-245) dated June 16, 2015, direction is given to Utilities Kingston for broader feedback on smart city initiatives:

*“Smart cities require technological infrastructure. The opportunity now is to further invest in the community to enable greater opportunities for technology use. This report [15-245] seeks Council’s authority to redirect the dividends from Utilities Kingston’s fibre operations for the four year period 2015 – 2018 (inclusive) to invest in community-related smart city projects, and requests Utilities Kingston to provide direction and advice to council on investments and the cost/benefit analysis of any potential investments for the community. The priorities related to expansion of WiFi and the promotion of fibre to strengthen Kingston’s competitive advantage will be included in the analysis and recommendations requested from Utilities Kingston as a first step in the action plan for progress. While it is recognized that Utilities Kingston owns and operates*

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*the City of Kingston fibre investment, it should be expected that private sector providers will also be valued partners in advancing this priority.”<sup>1</sup>*

Smart Cities leverage technology to help solve urban problems such as fostering economic development, reducing commute times, improving customer service and increasing the efficiency of municipal operations.

In addition, direction in report 15-245 included:

*“That Utilities Kingston be requested to prepare a report to City Council describing the opportunities associated with providing wireless internet (WiFi) in various locations of the city, including a cost and benefit analysis for the community;”<sup>2</sup>*

A detailed investigation into Smart City, Promotion of Fibre Access, and municipal WiFi are included in options/discussion section of this report.

Research completed for this report identified a number of initiatives that are likely not well known, that when considered within the context of this report are Smart City enabling. A “Smart City” vision for Kingston enabling an “Intelligent Community”, provides a basis for the community to be open for investment opportunities and build quality-of-life for all who live and work in the community.

The City, through Utilities Kingston, invested in fibre optic technology. Historically, the fibre business has not been widely promoted, but in 2015 Utilities Kingston has started promoting the business and raising public awareness of what fibre-based broadband can offer. The City and community can build on work completed by the Kingston Chamber of Commerce and others to provide awareness to citizens about what services are available, including those from all providers. This report provides a status of progress to date and sets the stage for continued advancements of technological tools and solutions.

### **Recommendation:**

**That** the City and Utilities Kingston update their respective technology plans and strategies to align and prioritize technology investments with Smart City objectives (that focus on economic development, customer service, reducing greenhouse gas emissions, and improving the efficiency of municipal operations); and

**That** Utilities Kingston fibre operations be requested to budget a sum of \$75,000 for each of the years 2016 and 2017 to market, promote and advance Smart City and Intelligent Community initiatives in the Kingston community; and

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<sup>1</sup> Report 15-245, page 9 of 30

<sup>2</sup> Report 15-245, page 3 of 30

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**That** Utilities Kingston work with partners, including the Chamber of Commerce and Kingston Economic Development Corporation to strengthen the business community's awareness of UK fibre and Smart City technology opportunities; and

**That** staff report back by year end 2016 with a status update on Smart City/Intelligent Community progress.

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**Authorizing Signatures:**

ORIGINAL SIGNED BY PRESIDENT & CEO, UTILITIES KINGSTON

**James Keech, President and  
CEO Utilities Kingston**

ORIGINAL SIGNED BY CHIEF ADMINISTRATIVE OFFICER

**Gerard Hunt, Chief Administrative Officer**

**Consultation with the following Members of the Corporate Management Team:**

Cynthia Beach, Corporate & Strategic Initiatives	Not required
Lanie Hurdle, Community Services	Not required
Denis Leger, Transportation, Facilities & Emergency Services	Not required
Desiree Kennedy, Chief Financial Officer & City Treasurer	

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**Options/Discussion:**

There has been significant energy around the concept of Smart Cities and Intelligent Communities in the past several years. Several factors contribute to this, some of which include communities reinventing themselves as innovative hotbeds for business and attractions for entrepreneurs. Kingston has seen its own momentum grow with the performance in the “Intelligent Community of the Year<sup>3</sup>” competitions in 2013, and 2014. This momentum was furthered with the “Seriously Smart” campaign in 2014 that saw the Kingston community further engage with a workshop to understand what else we could be doing, as well as more recently the Community Foundation for Kingston’s Speaker Series on Data-Smart Cities in April 2015.

Smart Cities represent a trend that began as a response to the rapid transition of population to urban centres, and the resulting challenges for the planning, development, and operation of cities. The phrase “Smart City” was adopted in 2005 by large technology companies as a means to focus attention on the application of technology to solving many of the complex problems of running a city. Today, that definition has evolved to encompass any form of technology-based innovation that improves the livability, workability, and sustainability of a city.

Utilities Kingston and the City of Kingston have continued to search for better ways to deliver service to the public, new ways to interact with the public, and to improve customer satisfaction by leveraging technology. These initiatives have tended to be operationally focused, or focused on new ways to interact with citizens. Nevertheless, many of these initiatives are considered foundational to a Smart City, and must be in place for an Intelligent Community to evolve.

To this point in time the City’s and Utilities Kingston’s investment, whether on technology infrastructure or new solutions/applications, has been driven primarily by the need to improve customer service, while at the same time operating as efficiently as possible to maintain levels of service within acceptable budget and tax and user fee parameters. As a consequence, the majority of technology investment has been directed to ensuring the technology infrastructure is reliable, secure, and meeting day-to-day business requirements of the organization. While not necessarily visible to the community, this investment provides a solid foundation on which many Smart City applications can be created. Similarly, strategic investments in technology have been made, and are continuing to be made, to improve the efficiency and effectiveness of administrative processes through automation and integrated systems.

More recently, priority is being given to new systems that support customer service improvements such as the new Development and Services Hub (DASH), Responsible Pet Ownership, and Social Services Appointment Scheduling. Investments in Transit technology such as CAD/AVL (Computer Aided Dispatch and Automated Vehicle Location) are designed to attract ridership and minimize the use of personal vehicles.

While these investments meet the definitions of Smart City technology, to this point they have not necessarily been marketed as such. Specific initiatives for both corporations (City and UK)

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<sup>3</sup> Conducted by the Intelligent Community Forum

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that are in progress, or planned, and that align with the Smart City definition are detailed in Exhibits A and B of this report. On October 20, 2015, Council will be presented with an Open Government Workplan, which will include a number of technology-enabled initiatives that if approved, will provide appropriate direction to plan and organize initiatives that align well under a Smart City banner. Citizen engagement/relationship management (CRM), Open Data, Information Access, Data-Driven Decision-making and Open Governance will be prominent directions.

### **Align technology plans with Smart City objectives**

The next steps are important to get right. Move too quickly and initiatives could be started without a solid understanding of the benefits they are providing. Move too slowly and Kingston can miss the opportunity to capitalize on evolving to an Intelligent Community. The next step is to align the City and Utilities Kingston technology plans with Smart City objectives. This is a measured approach that can have quantifiable metrics associated with it.

A plan which lays the foundation for Smart City and Intelligent Community needs to direct efforts of the municipal corporations. An aligned plan will ensure that the corporation has clear direction and support on integrating Smart City into their planning processes which will:

- Identify Smart City strategies over specific planning timeframes.
- Align technology to broader City strategies (such as economic development, customer service, etc).
- Identify and ensure that foundational technologies that enable Smart Cities are in place and supported.
- Identify how the municipal corporations (City and UK) should engage with the public to evolve an Intelligent Community.

This would have a waterfall effect on planning activities across the corporations such that as various plans are updated, there is a need to consider Smart City / Intelligent Community objectives during that process.

### **Promoting Fibre Access**

In the late 1990s, the fibre optic network built by Utilities Kingston was an economic development initiative for the City of Kingston that resulted from a lack of broadband network access within the newly amalgamated City of Kingston. Major telecommunications providers were focused on larger urban centers across Ontario/Canada. The municipality took it upon itself to do better and provide the municipality with cutting edge network services that leapfrogged what traditional telecommunications providers were delivering in Kingston.

In the following years the fibre optic network was expanded as more customers expressed interest, and as opportunities arose. Historically, the service provided by Utilities Kingston focused on the MUSH (Municipalities, Universities, Schools, Hospitals) sector. Customers in these sectors are highly technical and have applications that required the highly available, reliable, symmetrical, high bandwidth service that Utilities Kingston provided. In the last three

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years there have been an increased number of non-MUSH businesses that have become customers of the Utilities Kingston fibre. This corresponds with the proliferation of smart phones, and tablets, and the increase in applications hosted on the internet. Generally we have seen an increase in the need for large bandwidth network connections.

Utilities Kingston works with a number of local companies in the Kingston area; these companies use the fibre network and sell services to their customers. These “resellers” are an important part of the Utilities Kingston service as they help bridge the gap between the small / medium businesses in the Kingston area. The reseller partners act as a first line support to these customers, while Utilities Kingston provides the network access that the customer needs.

In 2012 the City contributed funds to the Eastern Ontario Regional Network (EORN) broadband project to bring fibre to rural areas of the Kingston community, not serviced by UK fibre. This was a very successful venture spearheaded by the Eastern Ontario Wardens’ Caucus. The relationship with EORN continues to develop positively.

In 2015 Utilities Kingston developed a new program with its reseller partners. This program provides detailed network information to resellers, such that they can more easily determine where Utilities Kingston infrastructure is, and sell service to customers. This program also includes provisions for Utilities Kingston to support marketing programs and materials developed by the resellers. Utilities Kingston is expecting to evaluate the performance of this program in late 2015.

In 2015, Utilities Kingston has also started sponsoring local business events which are relevant to the Utilities Kingston fibre operation. Examples of this include;

- Sponsoring a seminar titled “Data-smart Cities: Changing how Municipalities Deliver Services and Engage with Citizens” which was organized by the Community Foundation for Kingston & Area.
- Sponsoring the 2015 Kingston Chamber of Commerce Business Hall of Fame breakfast.

The purpose of these sponsorships is to get in front of local business leaders and let them know that Utilities Kingston does provide networking services and what the benefits of our network are. We expect these sponsorships and promotions to continue in 2016.

Utilities Kingston is partnering with the Kingston Chamber of Commerce to communicate with the members of the chamber the benefits of Utilities Kingston networking services. The Chamber completed an investigation into broadband service providers in the Kingston area, and determined that Utilities Kingston was the most responsive and in their opinion a great choice for members. Further the Chamber and Utilities Kingston are working toward promoting a new product offering in Q4 2015/Q1 2016.

Utilities Kingston and the Kingston Economic Development Corporation (KEDCO) have recently been working together to allow KEDCO to better understand the services that Utilities Kingston

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provides. This includes sharing information on the fibre optic services available across the Kingston area. The rationale for a renewed relationship is twofold;

1. To improve the business proposition for companies considering moving to Kingston and ensure that broadband access is available to companies. KEDCO is able to use this local information to promote Kingston as a place for business investment.
2. To grow the Utilities Kingston Fibre business. Working with KEDCO will allow Utilities Kingston to deliver more services to more customers in the Kingston area, ultimately resulting in value for the shareholder (The City of Kingston).

Any change to the status quo, or major project needs promotion to take a broad vision and translate that into something tangible that others can understand. This program will enable staff to buy into the vision, as well as interact with the community to ensure the vision meets the needs of the community. The initiatives documented in the exhibits of this report have developed organically. Departmental needs have led to increasing use of technology and finding efficiencies within that technology. However, to deliver on Council's vision of a smart and livable city, we need to engage the business community and increase awareness to develop economic opportunities and growth. Funding for this work is proposed in the Utilities Kingston (fibre) budget for the years 2016 and 2017 and is recommended in this report.

A concentrated effort working with partners including the Chamber of Commerce and KEDCO, among others, will strengthen the community's ability to inform itself for opportunities and enable greater confidence in the networks available in Kingston. Private sector investment is key to these enablers, such that all providers are welcomed in the market place.

### **Municipal WiFi**

WiFi is generally defined as a local area wireless networking technology<sup>4</sup>. This technology is finding its way into an increasing number of consumer devices, meaning the opportunity to interconnect those devices to each other and the internet is increasing. Providing WiFi access (with subsequent access to the internet) is getting to a point where the public expects it. This can be demonstrated by the number of businesses that currently provide, and advertise their WiFi access for customers to use. An evolving trend is for businesses to provide WiFi to draw customers into their establishments. Numerous private sector providers exist in this market place with advancements in technology occurring regularly. As a community, the City encourages business opportunity and competition. As such, Utilities Kingston fibre limits its strategy accordingly.

The City of Kingston has had a program to install WiFi access points at select locations throughout the City. These locations have generally been city facilities (office buildings, and recreational facilities), as well as specific public areas (marinas and Springer Market Square). At these locations the City has been providing free access to the internet for the public, as well as a connection to the corporate city network for city staff.

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<sup>4</sup> <https://en.wikipedia.org/wiki/Wi-Fi>

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The rationale for providing WiFi at specific municipal locations can be currently described as;

1. To provide internet access to those citizens that are using the facility.
2. To provide City of Kingston staff access to corporate network resources, using corporate computing devices. This allows increased efficiencies in providing services to the public, and tracking work completion, updating data information.

At this time, it is recommended that the City continue with its current practice of deploying WiFi at specific facilities and public spaces. Staff will continue to monitor developments and opportunities in the technology industry and report back to Council as part of the 2016 status update recommended in this report.

The biggest challenge to the success of an Intelligent Community is getting a common understanding of what an Intelligent Community is. Is it internet everywhere? Is it electronic devices everywhere? What do we get from an Intelligent Community? Why should I care about an Intelligent Community? Answering these questions is vital to shaping the vision the Kingston community can get behind. Intelligent Community as defined within this report needs to be communicated and a dialogue started within the community. Further, to develop initiatives that staff can implement, in collaboration with the private sector, universities/colleges or other entities, community input is needed in new ways, beyond what the current "open house" methodology provides. It is expected that this will involve community engagement and interaction to better understand what the community needs, opportunities for collaboration and partnership, as well as make use of the knowledge and expertise that exists in our community. Community engagement is not limited to individual citizens, the opportunity to do something innovative and special in Kingston is very real. As such, building relationships with the high tech sector (businesses, universities/colleges, others) and high tech interests in Kingston is critical. These members of the community can bring innovative ideas to the table, or upon seeing the challenges, can work toward innovative 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.

**Financial Considerations:**

Budgets for Utilities Kingston and the City of Kingston are developed on an annual basis and include amounts for the initiatives described in this report. In accordance with recommendations

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in CAO report 15-245, dividends from Utilities Kingston – Fibre will support funding requirements for technology in support of Smart City initiatives.

**Contacts:**

Jim Keech, President & CEO, Utilities Kingston 613-546-1181, ext. 2217

Gerard Hunt, Chief Administrative Officer 613-546-4291, ext. 2205

**Other City of Kingston Staff Consulted:**

Bob Schaefer, Manager Technology Infrastructure Services – City of Kingston  
Campbell Patterson, Project Manager, UK Fibre

**Exhibits Attached:**

Exhibit A - Smart City Initiatives – City of Kingston

Exhibit B – Smart City Initiatives – Utilities Kingston

### Smart City Initiatives – City of Kingston

While not meant to be an exhaustive list, the following tables provides context for smart city applications/solutions within the **City of Kingston**. They have been grouped into time horizons for completion, that is;

- Initiatives Happening Now.
- Initiatives Expected to Start/Complete in the next 6 months to 36 months.
- Initiatives Being Considered more than 36 months from now.

#### What is Happening Now?

Smart City Category	Initiative	Description (smart city perspective)	Benefits
Operational Efficiency Customer Service	Land Management, Planning and Development System (DASH)	Moving land management from manual/paper based processes to electronic/automated processes  Includes an online portal that developers and the public can use to initiate and track progress of development related applications.	Efficient and transparent land management services will attract new development and business to the Kingston area  The corporation will be able to measure throughout review processes to ensure responsiveness  Keep developers and home owners informed of progress throughout development stages  Better coordination between departments and improved communications throughout processes
Operational Efficiency	Financial Management System	Streamlining and modernizing internal financial management practices and systems.	Simplified and standardized processes will result in significant financial savings over time.  Transparency of procurement processes.

Smart City Category	Initiative	Description (smart city perspective)	Benefits
			Improved reporting and decision support capabilities.
Operational Efficiency	Facilities Management System	Leveraging online information system to manage and maintain city-owned building and real estate assets.	<p>Reduced costs through preventative maintenance programs and work order management.</p> <p>Centralized monitoring and control of environmental systems (HVAC).</p> <p>Maintain high resale value and safety of city-owned real assets.</p>
Operational Efficiency	Homeless Information Management System	Leveraging client management software provided by the Canadian federal government to assist community shelters to manage bookings, housing placements and case management.	<p>Ensuring there are enough services available in the area to serve homeless.</p> <p>Automatic reporting back to federal level agencies will help the federal government make relevant funding and policy decisions.</p> <p>Understanding needs and patterns of visitors of homeless shelters is the first step to reducing and ultimately eliminating homelessness in the Kingston area.</p>
Customer Service	Responsible Pet Ownership Program	Delivery of pet ownership services such as online registration/licensing, lost pet reporting and locating, and rewards program	Online registered pet lost/found capability will reduce animal control calls and trips to the pound saving money and improving welfare of

Smart City Category	Initiative	Description (smart city perspective)	Benefits
			<p>animal and community.</p> <p>Increased pet registration levels through innovative rewards program.</p>
<p>Customer Service</p> <p>Operational Efficiency</p>	<p>Innovative web and mobile apps:</p> <p>Cultural map</p> <p>Sir John A Macdonald Interactive Map</p> <p>Mobile Tours App</p>	<p>A mix of professionally curated and crowd-sourced (via trusted partners) information delivered through web and mobile app technologies.</p> <p>Shift in philosophy from large, slow to build applications to simpler, rapidly developed apps.</p>	<p>Promote tourism and interest in the City; improve the visibility and richness of Kingston's considerable historical and cultural assets.</p> <p>Encourage residents to learn about and participant in planning using technology and social media outreach.</p> <p>Streamline, simplify, and expand access to information.</p> <p>Bringing innovation and history together.</p> <p>Building smaller apps reduces risk while encouraging experimentation to discover what is possible and focus on what is most important.</p>
<p>Customer Service</p>	<p>Waterfront Master Plan App</p>	<p>An online app that allows residents to learn about key areas of the waterfront master plan and to share pictures and learn; facilitates social media outreach.</p>	<p>Improve awareness of, and engagement, in the city's waterfront master plan process through an innovative social media outreach tool.</p>
<p>Customer Service</p>	<p>Open Data</p>	<p>Publish approved municipally owned data sets for public use and</p>	<p>Improve public trust through transparency and accountability that comes</p>

Smart City Category	Initiative	Description (smart city perspective)	Benefits
		<p>sharing between internal departments.</p> <p>Development of legal and policy framework to encourage appropriate use and reduce liability.</p>	<p>with sharing data.</p> <p>Provide opportunity to combine municipal data sets from a variety of sources to discover new patterns/relationships, ideally leading to new insights and solutions.</p> <p>Enable the public to analyze and build solutions using government data.</p>
Operational Efficiency	3D GIS Visualization	Enhance decision support in urban/city planning through three dimensional models of the city.	Computer generated 3D models offer flexible, cost effective tools for a number of applications including urban planning (wind, shadow analysis), and emergency management/response.
Customer Service  Operational Efficiency	Council Agenda Management and Automation	Build upon existing council technology through collaborative report writing tools and council/committee meeting automation technologies.	<p>Ease of report writing and approval processes through collaborative tools and automated workflows.</p> <p>Opportunities to save significant staff time manually compiling agenda, agenda packets and minutes.</p> <p>Electronic distribution can also be automated ensuring participants and broader public can access information in a timely fashion.</p>
Operational Efficiency	Fire Dispatch Services Expansion /	Use common systems and shared services across municipalities.	Service delivery cost and process optimization.

Smart City Category	Initiative	Description (smart city perspective)	Benefits
	Partnership		Sharing of best-practices with colleagues in neighbouring jurisdictions.  Strengthening of partnerships within region.
Enabler Operational Efficiency	Kingston Interoperability Safety and Security (KISS)	Provide the participating partners with a common operating picture that will enhance the overall abilities of emergency services to coordinate and address dynamic and large-scale emergencies.	KISS will result in the ability of Police, Fire and EMS (ambulance) services to know in real-time, the locations of multiple agency resources and emergency tactical activities. The result will be enhanced safety of first responders and improved efficiency of emergency services
Customer Service	Transit Trip Planner	On-line capability to plan best bus routes to move across the City, interfaced with Google Maps.	Improves customer service and convenience.  Helps attract/retain customers / ridership.
Customer Service	Capital Projects Application	Providing interactive on-line access to 5-year capital program locations and information.	Improved transparency of planned capital expenditures and information sharing.
Customer Service	Waste/recycling schedules and reminders	Providing information on waste pickup dates and reminders (e.g., text/email).	Improves customer service, convenience and compliance.  Reduces non-compliance and cost of cleanup.
Customer Service	On-Line ticket payments	Ability to pay parking tickets on-line.	Improves customer service.  Reduces administrative cost of processing tickets/payments.

Smart City Category	Initiative	Description (smart city perspective)	Benefits
Customer Service	Recreation and Leisure program registration	Ability to register on-line for recreation programs.	Improves customer service, convenience. Reduces administrative cost of program registration.
Customer Service Enabler	Market Square Wi-Fi	In conjunction with the Downtown BIA, provides free Wi-Fi for the public at Market Square and Confederation Park.	Attracts tourists and citizens to downtown. Improves customer service and convenience.
Customer Service Enabler	Free Wi-Fi	Providing free Wi-Fi at many City facilities, including City Hall, arenas, and other public service centres.	Improves customer service and convenience.
Customer Service Enabler	PulsePoint	A free app that alerts CPR-trained users when someone in a nearby public place needs CPR and the location of public defibrillators in the vicinity.	Improves customer service, public safety. Partnership between KFR, KGH, Queen's and Bell Canada.
Enabler	Council Web streaming	Live web streaming of Council meetings from City Hall.	Engages citizens in decision-making and issues that affect the community. Provides a convenient way to access Council meetings from any location or device.

**What is Expected to Start? (6 months to 36 months)**

<b>Smart City Category</b>	<b>Initiative</b>	<b>Description</b>	<b>Benefits</b>
Customer Service  Operational Efficiency	Citizen Relationship Management	Enhance customer service experience through technology that helps staff provide timely, personal service and problem resolution to citizens and clients.	<p>Enhance customer service by automating collection and retrieval of data about past interactions with callers</p> <p>Provide multi-channel (phone, web) access to citizen services.</p> <p>Provide efficient work management tools from intake to resolution.</p> <p>Enable self and community based resolutions through the use of structured information (knowledge-bases).</p> <p>Develop a 360-degree view of the citizen to better meet and anticipate service needs.</p> <p>Increase citizen engagement through communities of interests, peer issue/question resolutions, improved feedback mechanisms and information analytics.</p>
Operational Efficiency  Customer Service	City Engine	Digital platform for the new consolidated zoning by-law. Enhances decision support in urban/city planning - ability to render in-house any changes or proposed changes to built form.	Improves the assessment of potential impacts to the community.
Customer	Development of location	A series of initiatives that will expand use of	Once data is being collected a variety of

Smart City Category	Initiative	Description	Benefits
Service Operational Efficiency	aware applications for the public and operations management	automatic vehicle location (AVL) technology throughout the corporate fleet.  Collection of real-time and near real-time tracking of vehicle location data and related applications	applications are possible including:  Apps that let general public know in real-time when their bus is coming or road will be cleared.  Automated passenger counting systems on buses and next stop announcements.  Work management applications include monitoring plow routes during winter storms, route optimization, dispatching and coordinating of work/emergency vehicles in an area in real-time.
Customer Service	City Platform	Design and operate an application programmer interface (API) for application developers to access city owned services and data.	Encourage local innovation and leverage creativity and expertise of private sector development community by moving beyond static data sets.  An API enables the development of innovative web and mobile applications using 'live' data and services provided by the city and other possibly other sources.  Potential for app users to contribute data back to the city
Enabler Operational	Automated validation of electronic data submissions	Use technology to automatically validate electronically submitted diagrams and drawings	Provide immediate, 24/7 technical feedback to those submitting electronic drawings and diagrams.

Smart City Category	Initiative	Description	Benefits
Efficiency	from the public	conform to technical standards such as format, scale and symbols.	Streamlines the process for the public and frees staff time from having to manually check electronic submissions.  Improved data quality through elimination of human error.
Operational Efficiency  Health & Safety	Tiger Shark / Prometheus – GPS enabled handheld mobile devices for operations management	Use GPS and NFC technologies to provide real-time location monitoring and activity reporting in Marinas, Recreation facilities and other locations.	Provides operational data on health/safety inspections, maintenance, and custodial activities, and variances against time/quality standards.
Operational Efficiency  Customer Service	“Big Belly” solar powered garbage bins (pilot project)	WiFi-enabled, self-powered waste management and recycling solution provides automated compaction and notification when full.	Reduces collection frequency and overflow from unattended garbage bins.  Improves the quality of public spaces.
Operational Efficiency	Angel Shark	Advanced analytics for recreation facilities (utilities, facility and program use)	Analyzes commodity costs/time of use and programming to optimize revenues and costs.
Customer Service  Operational Efficiency	Municipal Apps	Mobile apps for a range of municipal services including service requests, transit, parking, garbage & recycling, engagement, recreation and leisure programming, events, etc.	Complements city website with native mobile apps for high volume, seamless on-line experience and access to City services.  Streamline, simplify, and expand access to information.  Provides the City with feedback and insights into service needs and issues.

Smart City Category	Initiative	Description	Benefits
Customer Service  Enabler	Wi-Fi expansion	Expand Wi-Fi coverage at City facilities and strategic locations such as Transit transfer points, parks, and community centres.	Improves customer service and convenience.

**Where are we Headed? (36+ months)**

The following initiatives are in the concept/planning stage and are not approved at this point. They will be refined as they mature as ideas.

Smart City Category	Initiative	Description	Benefits
Enabler	Citizen ID	Develop a common citizen ID program to access services online and throughout the city.	<p>As the corporation rolls out more electronic services online, a common identifier becomes increasingly convenient to citizens - sign-on once using one account, one password.</p> <p>Enables citizens to maintain control of personal preferences and their data across applications.</p> <p>Potential to consolidate on one smart card technology used to access myriad of free and fee based services</p> <p>Development of single view of the customer that can be used for reporting and understanding interactions across all service groups (a possible</p>

Smart City Category	Initiative	Description	Benefits
			enhancement/linkage to citizen relationship management)
Enabler	Data science, predictive analytics	<p>Smart initiatives often result in collection of vast quantities of data from mobile apps, wearable devices and sensors. Extracting the most value from this data requires new skills.</p> <p>Solution may include a mix of internal skills development and partnerships with experts in the community (university/college for example).</p>	<p>Discover trends/patterns that may go unnoticed using traditional means.</p> <p>Develop deeper insights from data collected by applying sophisticated analysis.</p> <p>Leverage machine learning (AI) to discover new patterns and relationships between different data sets.</p> <p>Move from analyzing the past to analyzing the future</p>
Customer Service Operational Efficiency	Online Municipal Voting	Continued use (and possible expansion) of online voting during the municipal election in 2018.	<p>Provide convenient voting options for citizens and those that have difficulty visiting physical voting locations.</p> <p>Potentially engage groups that traditionally have low voter turnout at municipal elections, such as youth.</p>

## Smart City Initiatives – Utilities Kingston

While not meant to be an exhaustive list, this list provides context for what is happening across within **Utilities Kingston**. They have been grouped into time horizons for completion, that is;

- Initiatives Happening Now.
- Initiatives Expected to Start/Complete in the next 6 months to 36 months.
- Initiatives Being Considered more than 36 months from now.

### What is Happening Now?

Smart City Category	Initiative	Description	Benefits
Operational Efficiency	Utilities Kingston GIS Dashboard	GIS <sup>1</sup> -based tool for UK allowing staff in the field to view infrastructure mapping using a tablet, laptop, or smartphone.	Time saved returning to the office to look at infrastructure mapping.  Increased accuracy for infrastructure locates <sup>2</sup> .  Greater exposure to infrastructure layout / configuration due to ease of use. This means more staff are able to use infrastructure information as specialized software is not required to access it. Greater access to infrastructure information means better decisions can be made.
Operational Efficiency	Field Data Collection Tools	An initiative developed by Utilities Kingston staff, supported by the City of Kingston GIS department, this initiative is creating “applications” for data collection by field staff.	Reduction in data entry has resulted as traditionally the information collected was written on paper. This paper was then given interpreted and entered

<sup>1</sup> GIS = Geographic Information System

<sup>2</sup> Locate = the practice of identifying underground utility infrastructure before a hole is dug. This is done to prevent damage to the underground infrastructure.

Smart City Category	Initiative	Description	Benefits
		<p>Examples include;</p> <p>Streetlight pole condition Application– used during the LED change out to collect information on street light pole conditions.</p> <p>Valve Turning Application – used to record maintenance activities on water valves across the distribution system.</p> <p>Hydro Pole Condition Application – used to record the results of hydro pole inspections, vital to asset management.</p>	<p>into the records system. These tools allow for a more direct flow of information from the field, in to the records system.</p> <p>Increased accuracy in system condition results from easier collection of asset data.</p> <p>Asset management is able to be improved as decisions on the infrastructure can be made based on recent, accurate data.</p>
Enabler	Electric Utility “Smart Meters”	Mandated by the Province of Ontario, this initiative installed meters which measure electricity use and communicate that information wirelessly. This initiative will enable further projects which capitalize on the meters and their reporting capabilities <sup>3</sup> .	<p>Reduced estimating on customer accounts. Traditionally electric customers received an estimated consumption amount on their bill every other month. This is a normal practice in the Utility industry to keep meter reading costs manageable. Smart electric meters and the associated communications system have allowed for actual reads every month, ensuring customers only pay for what they use.</p> <p>Smart electricity meters</p>

<sup>3</sup> Note section on OMS/MyUtilities/GreenButton/Ecotageous

Smart City Category	Initiative	Description	Benefits
			<p>collect more data than electromechanical meters. This allows for more information for customers on what they are using, and when they are using it. This can allow customers to make informed decisions when to use electricity that makes sense for them.</p> <p>Smart electricity meters provide operational data to UK that will allow for a proactive response to power outages, system anomalies, and system state. This allows for an advanced level of asset management.</p>
Enabler	Gas Utility "Smart Meters"	Installation of gas meters with advanced data collection and communications features, which takes advantage of natural asset replacement cycle. The initial deployment will take four years and will focus on reducing the cost of meter reading.	<p>The cost to read gas meters will come down, as the new technology is easier to read than traditional methods.</p> <p>This enables future activities, which are expected to develop as lessons are learned from the electricity utility.</p>
Enabler	Water Utility "Smart Meters"	Installation of water meters with advanced data collection and communications features, which takes advantage of natural asset replacement. The initial deployment will take four	<p>The cost to read water meters will come down, as the new technology is easier to read than traditional methods.</p> <p>This enables future activities, which are</p>

Smart City Category	Initiative	Description	Benefits
		years and will focus on reducing the cost of meter reading.	expected to develop as lessons are learned from the electric utility.
Customer Service	myUtilities	An initiative which provides customer consumption information, and bill history online. Customers sign up from the Utilities Kingston webpage; the portal will then provide access to hourly electricity use information. Customers are also able to find PDFs of previous bills in this tool.	<p>Allows customers to view their hourly electricity use before they receive a bill.</p> <p>Allows customers to download their electricity consumption to a spreadsheet.</p> <p>Allows customers to download their electricity consumption according to the “Green Button”<sup>4</sup> initiative.</p> <p>This tool provides a “one-stop shop” for customers to interact with Utilities Kingston and get access to their detailed utility use information.</p>
Customer Service	Ecotageous Electricity Consumption Reports	A pilot project which analyzed electricity consumption for customers. Personalized reports were then mailed to customers with details on their electricity use, and ideas on ways to reduce consumption.	<p>This initiative helps interpret the large volume of data available to customers.</p> <p>Drives interaction with the Utilities Kingston conservation team to find ways for customers to reduce their electricity consumption.</p>
Enabler	District Water Metering	An initiative to install large water meters in the water distribution system. The	Improved understanding of the water system during

<sup>4</sup> Green Button – is a secure way to get your energy usage information electronically.

Smart City Category	Initiative	Description	Benefits
		data from these large water meters is analyzed to better understand how the system is operating.	<p>operating conditions.</p> <p>Able to identify problems in the flow which may indicate water pipe leaks. Quicker response to water system leaks means losing less water to the environment.</p> <p>This initiative provides more data to the decision making process for asset management, results in better/more informed decisions being made.</p>

**What is being worked on? (6 months to 36 months)**

Smart City Category	Initiative	Description	Benefits
Operational Efficiency  Customer Service	Electric Utility Outage Management System	An initiative which will combine data from the electric smart meter system, GIS, customer data, and the KHC SCADA <sup>5</sup> system. The tool uses alarms from the electric smart meters to identify the geographic area in which a power outage is being experienced. This information can then be shared with the public as a map on the Utilities Kingston website.	<p>Customer calls to the Utilities Kingston operations centre are expected to be reduced in the event of a power outage. This allows UK staff to focus on resolving the outage.</p> <p>Customers will be able to confirm that UK is already aware of a power outage.</p> <p>Customer service representatives will have more information in real time available to better answer those customers that do call in.</p>

<sup>5</sup> Supervisory Control And Data Acquisition

<b>Smart City Category</b>	<b>Initiative</b>	<b>Description</b>	<b>Benefits</b>
Operational Efficiency	Leak Detection in the Water Utility	An initiative which will make use of the smart water meters. Equipment will be installed at a customer premises that helps locate leaks in the water distribution system. This equipment is installed at select points throughout a neighborhood. Trending and alarms from the meters are collected and then analyzed by Utilities Kingston staff.	Water leaks are found and repaired before they result in failure of the pipe network.  Proactive leak repair reduces the amount of treated water lost to the environment.  Proactive leak repair reduces the severity of maintenance work such that it can be done with as little impact on the public as possible.
Operational Efficiency	GIS Dashboards	An initiative which presents data collected from the field in a meaningful way to utility staff. These dashboards will be used to track activities like annual maintenance programs, and asset condition.	Exploitation of data collected from the field.  Improved response to field conditions.  Real time views on annual maintenance program status.
Operational Efficiency  Customer Service	Combined Sewer Overflow Monitoring	An initiative that monitors combined sewer overflow events in Kingston which occur when there is a large surge of water into the combined storm and sanitary sewer system. In areas of Kingston where the sanitary and storm sewers are together this can lead to sewage being discharged to Lake Ontario. This initiative is updating monitoring at the holding tanks for these events, as well as an online tool for the public to see when an overflow has happened.	Public awareness  Improved monitoring and trending

**Where are we Headed? (36+ months)**

Looking out into the future, the initiatives here are not as well defined, or even approved at this point. They are initiatives that Utilities Kingston is working toward and will refine as they mature as ideas.

Smart City Category	Initiative	Description	Benefits
Customer Service	Daily Consumption for Water and Gas Customers	An initiative which will make use of the expanded functionality of smart meters in the water and gas utilities. This will allow for the recording of gas and water use daily (instead of monthly).	Empower customers to understand their use.  Increase awareness of conservation programs.
Enabler	Updated Water and Gas Tools in GIS	An initiative which will update the data models used by the water and gas utilities. This will allow for advanced features and modeling functions.	Allows for system modeling to be done in GIS. This means that different operational scenarios can be simulated, with the results analyzed for what is best. This allows for a number of “what-if” scenarios.  Combining the spatial mapping and system modeling into a single tool means that there is less duplication of data entry.  Moving to an industry standard model will make analytics on the system data easier to run and implement.