**City of Kingston**
**Report to Council**
**Report Number 18-012**

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| **To:** | **Mayor & Council** |
| **From:** | **Jim Keech, President & CEO, Utilities Kingston** |
| | **Gerard Hunt, Chief Administrative Officer** |
| **Resource Staff:** | **Craig Desjardins, Senior Manager, Innovation & Institutional Partnerships** |
| | **Kevin McCauley, Director, Measurement & Communications, UK** |
| **Date of Meeting:** | **December 19, 2017** |
| **Subject:** | **Smart City Strategy & Progress Update Report** |

## Executive Summary

In the Smart City Update Report (17-009) dated December 6, 2016, Council received details of the progress of City and Utilities Kingston (UK) Smart City initiatives realized through 2016 and requested staff to provide an update by the end of 2017 on the directives of Council relating to technology plans & strategies, wi-fi deployment, support to promote and market Smart City initiatives and efforts to expand awareness of the UK Fibre network.

As part of building a sustainable community, Smart City activities in Kingston continued to evolve in 2017. At the heart of the strategic priority of advancing Kingston as a smart, livable, 21st century city is the foundational goal of making the lives of residents better through innovation and technology. Providing meaningful improvements to municipal services has been embraced throughout the City and UK corporations with several of the most significant projects from 2017 chronicled in Exhibits A and B of this report. As an example, last month a small but powerful example of service improvements was launched. The "HONK" mobile parking application has dramatically changed the way residents and visitors search for and pay for parking. The application allows the user to find, pay and replenish their parking all from their mobile phone. Initial response to this app has been very favourable.

Smart City activities are also integral to providing a competitive economic advantage to Kingston. Leveraging of our fibre infrastructure, the new policy of open data and our strong partnerships with post-secondary education institutions build on the strength of the broader public sector in Kingston. Work must continue to link Smart City initiatives to the thriving private

sector start up ecosystem made possible by such organizations as Kingston Economic Development Corporation, Tourism Kingston, Innovate Kingston, Kingston Chamber of Commerce, Launch Lab, Business Development bank and the GreenCentre, among others, in order to further enhance our economic branding and messaging.

The power of a Smart City can also act as a focal point for efforts on the environment, social equity and recognition of the role of arts and culture in the community. The City's new Electric Vehicle (EV) Strategy and Utilities Kingston's Sewer Overflow Map Application which provides real-time notification to the public of sewer discharges, are examples of efforts to impact environmental sustainability. Improving access to wi-fi at City-owned facilities supports the goal of greater connectivity for those who don't have internet access.

Finally, the development of Smart City initiatives is creating the need for new models of collaboration between the public and private sectors that reflects partnerships rather than vendor/customer relationships. This research and development function takes advantage of the tight-knit, smaller community of Kingston with industry, post-secondary education and government working collaboratively to unlock value for social good.

**Recommendation:**

That Council receive the Smart City report and request staff to provide a progress update in November 2018.

**Authorizing Signatures:**

ORIGINAL SIGNED BY PRESIDENT & CEO, UTILITIES KINGSTON

**Jim Keech, President & CEO,**
**Utilities Kingston**

ORIGINAL SIGNED BY CHIEF ADMINISTRATIVE OFFICER

**Gerard Hunt, Chief Administrative Officer**

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

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| Lanie Hurdle, Commissioner, Community Services | Not required |
| Desirée Kennedy, Chief Financial Officer & City Treasurer | Not required |
| Denis Leger, Commissioner, Corporate & Emergency Services | Not required |

**Options/Discussion:**

In 2015 (Report 15-245), Council requested Utilities Kingston (UK) to take a leadership role to provide direction and advice to Council on potential investments in community-related Smart City projects and the possible City determined redirection of dividends from UK's networking operations for the four year period 2015 – 2018 (inclusive) to invest in community-related Smart City projects.

Progress Report (15-386) dated October 20, 2015, was delivered to Council to provide an update on the evolving Smart City and provide a framework for categorizing initiative*es underway at the City and UK.

Additionally, in Progress Report (15-386) Council requested that the City and UK 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 UK budget a sum of $75,000 for the years 2016 and 2017 to market, promote, and advance smart initiatives in the Kingston community; and UK work with partners, including the Chamber of Commerce and Kingston Economic Development Corporation to strengthen the business community's awareness of UK networking and Smart City technology opportunities and iincreasing revenue for the Kingston fibre network business while providing high quality internet access at competitive rates.

Progress Report (17-009) dated December 6, 2016, was delivered to Council to provide an update on Smart City initiatives realized through 2016. Updates were provided on work done to each of the directives from Council received in report 15-386.

Staff have continued to evolve Smart City activities in Kingston, and provides the following updates for 2017 based on Council's specific direction:

***Council Direction #1 – 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).***

**2017 Progress**

Early in 2017, staff identified the need to define the vision and goal of a Smart City strategy. To engage staff and the broader community in a meaningful way, the overarching vision of a Smart City must be people-centric (how do we make the lives of residents better). A Smart Kingston strategy that is presented in this report seeks to humanize the benefits and advance a common understanding of Kingston as a smart, livable, 21$^{st}$ century city by making the lives of residents better in tangible ways.

The formalizing of the Smart Kingston strategy is the result of a number of economic and social drivers impacting the City including:

- Cost and budgetary pressures in the delivery of municipal services,
- Citizen demand,
- Impact from investment in smart technology by other levels of government and
- Market and technical advances being made in private sector.

The benefit of pursuing a Smart Kingston strategy can and will have far-reaching for the community including faster reaction to public safety issues, data-driven policy decision making, lower traffic congestion and pollution, energy savings, economic growth & job creation and reduced leakage and faster repair in water network to name only a few outcomes.

In order for the City and community to build a Smart Kingston, we need the following capacities:

- Sources, access to and volume of data
- Network infrastructure technology
- Skills set and technical competencies
- A culture of openness to new ideas and risk tolerance
- Strong and vibrant private-public economic ecosystem that is supported by business investment
- Seed funding and resources for projects and solutions
- Access to the knowledge creation and talent of post-secondary educational institutions

**Vision**
The Smart Kingston vision consists of three main elements:

1. **Economic Development**
   The Smart Kingston strategy is a platform to build a competitive advantage in terms of infrastructure and human capital to support growth, prosperity, and quality of living.

2. **Innovation in Municipal Service Delivery**
   The Smart Kingston strategy drives the development and adoption of technology in government operations in order to be more efficient and provide better service to the public.

3. **Brand Development of Kingston**
   The Smart Kingston strategy is a foundation of our brand positioning as a smart, livable, 21st century city.

The Smart Kingston strategy employs the Intelligent Community Foundation concept of the Virtuous Cycle which guides the City in its Smart City evolution. The Virtuous Cycle consists of the follow components:

- Broadband connectivity is the starting point and is recognized as an "essential service".

- Open access to high-quality broadband services enables growth of the knowledge economy and workforce. Developing a knowledge-based economy and workforce is driven by innovation.
- Innovation helps drive digital equality that is working to ensure that the community has access to resources by lowering the cost of participation.
- Sustainability of the process occurs through the benefits found through innovation.
- Advocacy by the City is important to ensure the community, other levels of government, and external partners are aware of what we are achieving and how important their participation is.

## Environmental Scan

The creation of a Smart Kingston strategy is an important step toward the City of Kingston and Utilities Kingston demonstrating the Smart City benefits of greater efficiency, social equity and improved livability. It is also important to expand the engagement of all interests of the broader community in order to advance the goal that sees everyone in the community participating in and benefiting from Smart Kingston outcomes.

An environmental scan conducted as part of the development of the strategy identified a number of external and internal factors impacting smart activities in Kingston including:

## External Factors

- Disruption to traditional business models - subscription, sharing economy, pay-per-use, advertisement-based revenue, SaaS (software as a service). For example, technology enabled firms like Airbnb and Uber have grown as the sharing economy has developed.
- Changes to the labour market due to robotics and Artificial Intelligence technologies may have a dramatic impact on employment levels and cost structures of firms
- Impact of technology on social inclusion and equality.
- Data analytics and information security and privacy.
- Growth of mobile connectivity in all aspects of life can contribute to greater social engagement

## Internal Factors

- Existing commitment and recognition of role of Smart City/technology.
- Commitment to better public engagement/open government for sharing of information.
- Culture of cost containment and drive for operational efficiencies.
- Recognized need for strong City brand and communication strategy.
- Significant fibre infrastructure of both the City and UK provides challenge and opportunity.

## SWOT Analysis

The analysis of the strengths, weaknesses, opportunity and threats (SWOT) presented below highlights the extremely strong position the Kingston community has with respect to Smart City activity and growth.

**Strengths**
- Political leadership
- Interest and commitment from staff at all levels
- Existing Smart City activities/projects underway (momentum)
- Human resource expertise within the organizations
- Fibre Optic network owned by Utilities Kingston
- Post-secondary education institutions - Queen's, St. Lawrence College and Royal Military College that provide access to knowledge creation and innovation that can be commercialized and access to talent
- Strong not-for-profit network of organizations and volunteers
- Large concentration of public sector organizations
- Interest by private sector in the community

**Weaknesses**
- No unifying vision/framework to advance smart initiatives
- Limited City staff resources/time to put to smart initiatives
- Need to better understand who is doing what within City and within the community
- City and Kingston community not often considered an employment or career option by millennial graduates from some post-secondary education institutions

**Opportunities**
- Strong internal City department cooperation
- UK-owned fibre optic network as a foundation for connectivity for residents and firms
- Build expertise within the organizations would give us the experts to move this forward.
- Increase commercialization of innovation from post-secondary institutions in Kingston in addition to providing critical human capital resources
- Increasing interest and emphasis on direct foreign business investment in Kingston and as a destination of academic study by international students
- Expanding innovation adoption in the broader public sector
- Improving the retention of post-secondary school graduates in Kingston with new opportunities of employment
- Increase the number of private sector firms in the Kingston economy to support larger growth rates in GDP and employment
- Increased collaboration with our municipal partners in eastern Ontario in smart initiatives will drive greater rural innovation and support a strong economic region

**Threats**
- Proprietary systems that do not communicate openly
- Cost of smart initiatives may be significant without an understanding of value and how to quantify intangible benefits
- Misalignment of resource allocation and timing for path forward in the departments in City
- Failure to fully embrace/adopt innovation culture
- Lack of adequate public engagement in the development of smart initiatives

- Failure to capitalize on existing momentum of smart activities in the community and strong asset base for innovation

## Goals

The goals set out in the Smart Kingston strategy are built on a foundation of open and transparent government and respects the requirement for inclusive and collaborative outcomes. The goals include:

- Create innovation that is tangible and that directly impacts citizens
- Engage the public in the municipal innovation process
- Ensure that innovation outcomes benefit the broad spectrum of communities and groups in the city
- Collaborate with private and public sector partners to grow the innovation ecosystem
- Invest in innovation that provides a positive return on investment for the City/community

## Smart City Transformation

As has been discussed, Smart City activities that focus on making the lives of residents better should be people-centric versus technology-centric. The digital transformation of the City and our community is not just about implementing more and better technology; it involves aligning our organizational and community culture, people and talents, structures and systems and tasks in order to create the best possible outcomes.

Our digital strategy must be integrated into the corporate strategy through the strong communication of both vision and risks. The use of "Lean" government processes that encourage innovative idea creation, tests, uses learning to improve ideas can be the foundation of a smart and innovative city and community. By organizing work around projects and programs rather than departmental silos, stronger partnerships are built.

For a transformation to occur, a culture of innovation and a level of risk/failure tolerance is required. The use of pilot projects rather than large initiatives provides a process for testing and enables better control at both the administrative and political levels. Pilots can then be revised and scaled based on the evaluation of outcomes.

Any transformation requires people/talent/skills to execute. Changes in our workforce including the growing number of older workers and number of workers retiring from the labour force, automation and robotic technologies and shifts from the traditional model of employment (decline of full-time employment and rise of part-time, temporary, and contract work but also remote working and the "gig" economy), are affecting the role that human capital plays in organizations. This in turn affects recruitment and retention of talent for organizations.

## Smart Kingston Strategy Alignment - Internal & External

Within our organization, a Smart Kingston strategy must align with existing internal strategies and program/projects. This would include, but not be limited to:

- **Overall business strategy**
  Council's strategic priorities of smart economy, greening the city, livable community and open government directly relate to Smart City efforts. In addition, customer focus, organizational effectiveness and efficiency are major drivers of smart technology.

- **Capital budget and infrastructure investment strategy**
  Support for innovative infrastructure, platforms and applications will continue to support City operations whether specific to technology (hardware and software i.e. ESRI's ARC-GIS platform or systems controls for facilities) or in the incorporation of new processes or methods i.e. new formulations of asphalt, changes in the way we process bio-solids or how Planning & Development supports development through the DASH system.

- **Communications, branding and engagement strategy**
  Building on City and community branding and communications - *where history and innovation thrive* - will involve a significant reliance on technological tools and platforms to inform and sell our community to the region, province, country and the world. The significant success of Kingston in attracting direct foreign investment is an example of the need for a global/international communications and branding plan.

- **Economic strategy**
  As the Kingston Economic Development Corporation and the City re-imagine our economic strategy in 2018, the exploration of the "Govtech" sector (government technology or Smart City) that builds on our large concentration of public sector organizations and utilizes our post-secondary education institutions' knowledge and human capital capacities should be a priority. There is great potential to see new private sector technology firms flourish in the community with so many government organizations including healthcare, education and the military. Small startup firms that capitalize on this close access to public sector customers will drive employment and wealth creation.

- **Climate Change and GHG Reduction strategy**
  Greening the city requires the coordination of efforts to address climate change through GHG reduction, waste reduction, recycling and active transportation. The introduction of an Electric Vehicle Strategy, innovative building and system technologies make our community a great place to live.

- **Workforce development and talent recruitment & development strategies**
  To ensure that organizations have the human resources needed to compete and thrive in a global economy requires a coordinated and targeted strategy. Defining what it means to work in Kingston, tapping into talent, creating pathways to employment and careers and creating more diverse and inclusive workplaces makes our community better able to grow and prosper.

- **Utilities Kingston Networking Business Strategy**
  Building on Utilities Kingston's vision to facilitate economic development, Utilities Kingston is committed to innovation, prosperity and service excellence through infrastructure and reinvesting in our community's future.

The Smart City strategy must also align with strategies of external partners and stakeholders. There is considerable value in looking for opportunities for collaboration and investment/funding as part of our Smart Kingston strategy execution. Consideration of external partner and stakeholder strategy and policy priority alignment should include:

- **Federal government policy**
  In addition to federal support to municipalities for infrastructure, policy and program priorities of GHG reduction and climate change, innovation and support for sector clusters present opportunities for engagement.

- **Provincial government policy**
  Provincial priorities that have direct benefit for the city include greening the economy, strengthening healthcare, investing in education, building transit and transportation infrastructure and creating more inclusive communities. Recently, the Province released the "Building Better Lives: Ontario's Long-Term Infrastructure Plan 2017" which details the  Government of Ontario's commitment to work with all partners to ensure Ontario has the best possible broadband infrastructure.

- **Eastern Ontario regional economic development strategy**
  Opportunities exist to work more collaboratively through the Eastern Ontario Leadership Council (EOLC) around economic development themes of workforce development, innovation and technology deployment and intelligent transportation.

- **Post-secondary education institution strategies**
  There is an increasing priority placed on experiential learning opportunities for students and in the development of programs to support innovation and entrepreneurship. This further supports talent recruitment and economic development in our community and the region. The commercialization of knowledge developed through research holds great potential for job creation.

**2018 - Look Ahead**

Staff plan to develop a communication and engagement plan for the Smart Kingston strategy. This will include educating City of Kingston and Utilities Kingston staff about the strategy; why it is important, and the vital role that employees will play in helping realize the benefits of a Smart Kingston. But just as importantly, a community engagement process will be developed as part of this strategy.

**Smart Kingston Partnership Development**

The City and UK have been working to build opportunities to collaborate on Smart City initiatives. UK and the City have focused on growing collaborations with post-secondary education institutions, both Queen's University and St. Lawrence College, with particular emphasis on growing relationships with the Queen's Centre for Advanced Computing, Scotiabank Centre for Customer Analytics, the Centre for Social Impact and the St. Lawrence College Innovation Hub and Data Analytics program. The City and UK is also engaging with a number of private sector firms that have potential for strong alignment with current and future Smart City initiatives. Details of specific project(s) and associated partners continue to evolve and will be the subject of future Council reports, should they materialize.

**Funding Opportunity- Smart City Challenge Program**

Late last month, an opportunity to help accelerate our strategy to build a smart, livable, 21st century Kingston was announced by the Government of Canada. The Smart City Challenge Program is a $300M competition for municipalities across Canada to support bold and innovative plans to improve the quality of life for citizens through real and positive outcomes.

The Program has three prize categories; one of $50M with open eligibility, two prizes of up to $10M for communities with populations under 500,000; and one prize of up to $5M for communities with populations under 30,000 people.  The Program challenges "leaders to be bold and think outside-the-box… to approach the challenge through a lens of transparency, experimentation, inclusiveness, empowerment, and knowledge-sharing and to have the biggest impact on the people who call your communities home."

The application process is two-staged with a deadline for stage one submission of April 24, 2018. Finalists will be selected in summer 2018, and will be provided $250,000 to complete a final application with winners announced in spring 2019.

In anticipation of this announcement, staff have been engaging potential partners including Queen's University, St. Lawrence College and several private sector technology firms to conceptualize a model that might be used as a framework for an application. Any application developed would complement the Smart Kingston strategy outlined in this report and include engagement with interested residents in the community.

*Council Direction #2 –Wi-Fi Deployment Strategy*

**2017 Progress**

The current municipal Wi-Fi deployment strategy involves using the robust Utilities Kingston fibre infrastructure to leverage City-owned facilities, and spaces to deliver free Wi-Fi to the public. The current strategy ensures that the existing Wi-Fi infrastructure is continually upgraded and service quality/availability is improved as part of the IS&T technology sustainment funding initiatives.

Currently, free Wi-Fi is available at the 31 locations identified on the map in Exhibit C. Members of the public will see the "City_Guest" wireless network to join in their devices. In 2017

significant improvements were made in the Wi-Fi infrastructure to increase reliability and position the network for future upgrades planned for 2018.

**2018 Look Ahead**

In 2018, staff plans to continue to execute the strategy of refreshing equipment and improving services. By the end of 2018 all Wi-Fi access points will have been upgraded to provide enhanced coverage and reliability. Further, to support the Smart Kingston strategy staff will investigate how to best communicate that free Wi-Fi is available and encourage its use, to support the Kingston brand.

***Council Direction #3 – That Utilities Kingston 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.***

**2017 Progress**

As indicated earlier, staff believe the need for an overarching strategy is extremely important. Without a strategy, there is the risk of expending effort that does not support the desired outcomes. Staff resources and effort were focused in 2017 on developing the Smart Kingston strategy. Staff did not want to hold a Smart City forum without the strategy established and a plan related to communicating the strategy was made. Consequently, a Smart City forum was not held in 2017.

**2018 Look Ahead**

Staff expect to develop a communications and engagement plan for the Smart Kingston strategy in 2018. The development of the plan is to be funded from this source. As the communications and engagement plan is delivered, staff will then work to build an appropriate budget for delivering the actions within the plan. The City's capital budget includes $100,000/year for the next 10 years to support Smart City initiatives. Staff expect to use a portion of this funding to support creating greater awareness of the free Wi-Fi available at City-owned facilities and spaces.

***Council Direction #4 – That Utilities Kingston work with partners to strengthen the business community's awareness of UK Fibre and Smart City Technology opportunities.***

**2017 Progress**

Utilities Kingston worked closely with its partners to ensure UK services are known, and available to potential customers. Internet Service Providers (ISP) are local companies who use the UK fibre infrastructure to provide services to their customers. These ISPs have been an integral part of this activity and in the past two years, we have seen a significant number of new customer sites added. ISPs are important as they help reach more of the Kingston business community, as well as being important community businesses themselves.

Utilities Kingston has undertaken a strategic planning process to guide the evolution of the networking business. A major deliverable resulting from this work is a market demand study, expected to be delivered in early 2018. The market demand study will be a foundation for UK to

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update its business plan for the coming years. The market demand study along with an updated product catalogue of networking services that UK can provide will provide the necessary support to further grow the business in 2018 and beyond.

**2018 Look Ahead**
Staff expect to work with the community in 2018 as the Smart Kingston communications plan is developed and implemented. Community involvement in the Smart Kingston plan will support the UK networking business as the City believes that the broadband infrastructure delivered by UK is an integral foundation on which to build Smart Kingston. Utilities Kingson will continue to work with its local partners to deliver highly available broadband services across the Kingston community.

**Existing Policy/By Law:**

Kingston's Strategic Plan 2015-2018
UK Strategic Plan
Workforce Development & In-migration Strategy

**Notice Provisions:**

None

**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 in Report 15-245, dividends from Utilities Kingston – Networking will continue to support funding requirements for technology in support of Smart City initiatives.

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**Other City of Kingston Staff Consulted:**

Jeff Bumstead, Chief Information Officer

**Exhibits Attached:**

Exhibit A – City of Kingston Smart City Accomplishments 2017

Exhibit B – Utilities Kingston Smart City Accomplishments 2017

Exhibit C – City of Kingston provided Wi-Fi locations

**City of Kingston Smart City Accomplishments 2017**

Connected things are important and vital to a Smart City but ultimately what makes a Smart City has to start with connected citizens - to each other and to the City itself. This starts with improving citizen communication and engagement.  The City has several important initiatives underway that leverage technology to impact the way our residents engage with the City and the way we deliver services to our residents:

- The Public Engagement Framework
- The Customer Experience Strategy
- Open Data
- Data Centre Upgrades
- Evolution of the Business Application Landscape

***Public Engagement Framework***
- What
    - In 2017 the City developed a Public Engagement Framework to guide how residents and the City engage on issues or efforts put forth by residents, Council or City staff.
    - An online public engagement platform was identified as a priority to ensure residents can provide input on policies, projects and initiatives, as well as an effective way to provide residents with an online option to bring ideas forward.
    - In October 2017 the City launched an online public engagement platform which will be active as a pilot for an 18-month period. Residents can provide input on projects, programs and initiatives and bring new ideas forward using this platform. City employees who are identified as subject matter experts will engage with the public to answer questions and respond to ideas.
    - The online public engagement platform also includes an internal platform. This will allow City employees to be able to provide input.
- Who
    - The Communications and Customer Experience department (C&CX) worked with Information Systems and Technology (IS&T) to identify a cloud-based solution that met the City's needs.  Working with various departments across the City, C&CX then configured the engagement platform and deployed various engagement projects.
- Why is this important
    - A key role for the City in creating Intelligent Communities is to foster an ecosystem that brings normally unconnected parties together and allows for idea sharing, engagement and advocacy
    - In the past, the majority of public engagement was achieved through face-to-face interactions such as public information sessions, individual staff interactions, or through emails and surveys posted on the public website. This process is limited in what and how people can comment and residents do not have an avenue to bring new ideas forward online using the City of Kingston website.

**City of Kingston Smart City Accomplishments 2017**

- o The online public engagement platform allows residents to review and comment on City business in a safe environment without having to travel to specific locations or at specific times. This is expected to increase considerably the level of engagement, advocacy and the diversity of the residents that are able to participate in City initiatives.

*Customer Experience Strategy*
- What
  - o In 2017, in support of the Customer Experience Strategy, the City acquired the Oracle Service Cloud, a state-of-the-art Customer Relationship Management (CRM) system which will be implemented across all services areas starting with the Contact Centre in mid-2018
  - o The CRM will allow the City to better track service requests, automate an increasing number of customer interactions and develop a 360 degree view of our customers
- Who
  - o The Communications and Customer Experience department (C&CX) worked with Information Systems and Technology (IS&T) to develop a Request for Proposal (RFP) and acquire the Oracle Service Cloud CRM solution. Working groups have been formed with various departments across the City and Utilities Kingston to support the implementation of the CRM.
- Why is this important
  - o The CRM will provide the foundation for the City's service management and customer experience framework across all delivery channels – web, phone, email, in-person counter, mobile, social and other channels as these evolve.
  - o This will result in reduced barriers to service, more transparency in the delivery of services, easy access to accurate and timely information, less effort to deal with the City

*Open Data*
- What
  - o In 2017 the City published five additional open data sets including live transit location data and cycling facilities. The total number of open data sets available for download at the time of writing this report is 23.
  - o The various open data sets are downloaded an average of 800 times a month and have been used by the development community to create many value added applications including "SC Transit"
  - o Work was completed in 2017 to source an Open Data Portal which will be deployed in 2018. The open data portal will provide more flexible access to the City's open data sets and open a two-way dialog with the developer community on what data is made available and how it is used.

**City of Kingston Smart City Accomplishments 2017**

- Who
  - o The open data program is managed by the Information Systems and Technology department working with various departments across the City who create and steward the data.
- Why is this important
  - o Open data is about how we can create, share, collaborate and use information to create better cities.  Open data is data that anyone can access, use and share.
  - o An active open data program is an indicator of citizen engagement

### *Data Centre Upgrades*
- What
  - o A data centre is a facility composed of networked computers and storage that the City uses to house its many software applications and to process, store and disseminate its data.
  - o Over the past 3 years the City has invested in the creation of two primary data centres at geographically separate locations
  - o The use of state-of-the-art high efficiency power protection and air conditioning systems and the move to virtual server technology has significantly reduced the footprint, power consumption and heat generation increasing the systems supported and the security and reliability of the data centre.
  - o Power consumption has been reduced by 63% while the number of servers (virtual) has increased by over 250%.
- Who
  - o This work was led by the IS&T Infrastructure Services group and supported by all divisions within IS&T.
- Why is this important
  - o A reliable, robust and secure data centre is a critical and foundational part of the fabric of a Smart City. Many of the advantages of smart cities will come through real-time processing of large amounts of data.
  - o The City has created an environmentally responsible and sustainable data centre that will support the Smart City vision outlined in this document.

### *Evolution of the Business Application Landscape*

The City maintains an ecosystem of over 150 business applications that support the efficient and effective operation of City business and service delivery. These systems form an important foundational layer on which to build Smart City capabilities.  In addition to the systems highlighted above, enhanced capabilities were added in several systems including:

- Migration to a new corporate Financial Management Systems (FMS) providing better financial controls, increased visibility and up to date reporting.

**City of Kingston Smart City Accomplishments 2017**

- Launch of a new Environmental risk Management System (ErMS) that provides a set of processes and practices that enable the City to reduce its environmental impacts and increase its operating efficiency
- Upgrade of the M5 Fleet Management system with improved fleet maintenance processes.
- Migration to a new Learning Management System (LMS) to facilitate on-line education and training for all City staff
- Improvements to the Homeless Individuals and Families Information System (HIFIS) to support enhanced reporting and performance measurement.
- Launch of the HONK pay-by-mobile parking application to allow the public to pay for and extend parking from any mobile device
- Availability of real-time tracking information for Kingston Transit in open data format to make real-time arrival information using Google Maps, or other free transit apps, on a computer, tablet or smartphone

**UK Smart City Accomplishments 2017**

One of the goals of a smart cities approach is to achieve meaningful outcomes for the community by leveraging data and technology to make information more open, accessible and transparent.  In 2017 UK completed several important initiatives that support this goal:

- Combined Sewer Overflow Monitoring
- Increased Use of Mobile Devices to Complete Field Work
- Leak Detection Pilot Project

*Combined Sewer Overflow Monitoring*
- What
  - Across municipalities in North America common practice used to be that sanitary sewers and storm sewers were interconnected. In the event of a major storm event, there is the possibility that the interconnected (or combined) system cannot handle the load, and water is released into the natural environment. Kingston is no different than other old North American cities in having combined sewer areas. Utilities Kingston has been working to separate the sewers so that in the event of a major storm, sewage is not released to the water surrounding Kingston. In 2017, Utilities Kingston released a real-time public monitoring system for points where combined sewer overflows can occur. The intention is that members of the public can visit the Utilities Kingston website to see, in real-time, if there has been an overflow in the past 48 hours.
- Who
  - Several departments across Utilities Kingston developed a solution in-house and then worked to build it. The system involved sourcing equipment, installing the equipment, and building information systems to store, present, and alert on the data received.
- Why is this important
  - Utilities Kingston has been working to reduce the combined sewer system in Kingston; however, there is still work to do.
  - Utilities Kingston believes that building better communities involves providing information to the public so that informed decisions may be made. In this case, that means providing information to the public so that they may make informed decisions when using the waterfront around Kingston.
  - It is believed that this is the first real-time reporting system of its kind in Canada, and maybe North America.

*Increased Use of Mobile Devices to Complete Field Work*
- What
  - Utilities Kingston continued to exploit tools in the ESRI GIS platform to provide field staff information, as well as provide a method for field staff to get updated information back into the system for updates.

**UK Smart City Accomplishments 2017**

- Who
    - Several departments in Utilities Kingston use the ESRI platform to collect data from the field from work operations. Meter change programs in 2017 relied on the use of electronic work management functions to organize, dispatch, and track work progress through the year.
- Why is it important
    - Using electronic means of reporting work done in the field helps to give field workers tools and information to complete their work to the best of their ability. This means that additional information is available to field workers in the form of maps and data related to utility infrastructure while out in the field. This eliminates the dependence on paper based maps, and phone calls to office staff.
    - Collecting information electronically helps to ensure the accuracy of data as difficult to read handwritten notes are eliminated.

*Leak Detection Pilot Project*
- What
    - Utilities Kingston began a pilot project in Westbrook to understand how effective leak detection technologies are to the water distribution system.
- Who
    - A multi-disciplinary team at Utilities Kingston is working to reduce water loss in the drinking water system in Kingston.
    - The pilot project in Westbrook involves a number of sensors installed on the water service in customers' residences. These sensors "listen" to the noise and vibrations that are present on water services. Water leaks in the water distribution system generate noise (water rushing out of a small hole). The leak detection system collects a large amount of information about the noise on the water distribution system. Data analytics are then performed on all of the data received which identifies the tell-tale acoustic signature of a water leak, and is able to locate it spatially using triangulation from all of the data received.
- Why is this important
    - Water that is treated at the water treatment plant, but does not get to a customer to use represents wasted resources.
    - By tracking down leaks in the distribution system we can ensure that we are being efficient with our resources, and delivering the best value for customers.
    - Completing a pilot project allows Utilities Kingston to test the technologies involved and determine if they are valuable in finding water leaks. Experience gained and lessons learned from this pilot project will inform future work to reduce water loss across the entire city of Kingston.

City Facilities with free Wi-Fi