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Coquitlam

For Committee

February 12, 2018
Our File: 04-1310-01/000/2017-1
Doc #: 2779275.v5

To: City Manager
From: General Manager Finance and Technology

Subject: **Technology Roadmap**

For: **Council-in-Committee**

Recommendation:

That the Committee receive the report of the General Manager Finance and Technology dated February 12, 2018 and entitled "Technology Roadmap" for information.

Report Purpose:

The purpose of this report is to seek Council's feedback on the City's proposed Technology Roadmap that is anticipated to guide how technology will be used to support the City's corporate strategic plan and assist in the delivery of business priorities over the next five years.

Strategic Goal:

The Technology Roadmap supports the City's strategic goal to achieve excellence in City services by providing a five-year high level plan that identifies enabling technology strategies and initiatives that will ultimately deliver benefits to the City in terms of improved business operations and services to the community.

Executive Summary:

The Technology Roadmap was identified on the 2017 Business Plan as a "C" priority with a goal to gain a better understanding of the current technical environment, the current and future business drivers, the operational and functional needs of business areas and an overarching architecture to guide future technology improvements. Specifically the objective was to identify technologies that can improve operational efficiency and public services over the long-run and a strategy to prioritize and implement potential new technology over the next five years.

The process to develop the Technology Roadmap began in early 2017 and has included in-depth consultation with each business department, a community survey, input from the Youth Council and assistance from an external technology consultant. The resulting document includes a variety of Technology Initiatives organized under six Enabling Technology Strategies. These initiatives

PWS

include both improvements to existing systems, as well as identification of new or emerging technologies and innovative solutions that could be considered by the City for future service improvements. In addition, the detailed document provides a framework for the implementation of the initiatives, including a process to assess, prioritize and deliver the technology improvements. Attachment 1 is a summary of the Technology Roadmap in presentation format and includes some of the key initiatives identified in each Enabling Technology Strategy. Attachment 2 provides Council with a sample "initiative" page from the detailed document to illustrate the depth of information that is included in the full plan.

Background:

The City's Information and Communications Technology ("ICT") division is responsible for implementing and maintaining technologies that support City business processes, information needs and on-line citizen services. In 2013, a comprehensive review of the ICT division was completed with very positive results. Coquitlam was found to be a leader in the municipal sector with respect to its use of technology and the division has continued to provide excellent customer service to its internal and external clients.

The City has a functionally rich technology environment and has historically adopted a "best of class" approach to business software, resulting in a broad range of applications for specific purposes. Additionally, whenever possible, there was a preference to adapt or expand an existing application to support new business requirements, rather than purchasing and implementing new systems. While there are benefits to these traditional approaches, including minimizing capital costs and expenses associated with training and support, the drawbacks of this strategy are that, over time, systems can become outdated or so customized that they fail to fully meet the needs of the people using them.

With the City's continuing growth and more complex environment that bring new challenges on technology users, both internal and external, and the prevalence of new less expenses technologies, such as cloud-based solutions, it has become important that ICT reevaluate its technology strategy and explore new possibilities. In this regard, ICT commenced a process to review its service delivery and strategically plan the City's technology over the next five years.

In June 2016, the new Manager Information and Communication Technology began meeting with key business stakeholders within the City to learn more about their technology requirements and evaluate the service levels being provided in order to complete a holistic ICT assessment. One of the outcomes of this process was the apparent need to establish an Information and Communication Technology Roadmap to guide the review, analysis, project delivery and implementation of new technologies as many business areas voiced their desire to improve the systems that support their business areas or to

investigate new technologies. As such, the intent of this plan is to ensure that the City is maximizing the use of its systems to support its operations, as well as ensuring that all supporting technology is positioned to respond to future changes in user demands. Moreover, while this assessment confirmed that the ICT division delivers reliable infrastructure and system support, the review highlighted the need to reposition the division as a strategic partner to the business areas in order to assist in the review and selection of innovative technologies that will support their services.

Discussion:

The City's Technology Roadmap is a plan that determines how technology will support the City's business strategy and help deliver business priorities over the next five years. It identifies six "Enabling Technology Strategies" which in turn include a variety of Technology Initiatives. These Strategies and Initiatives form the foundation of how the City will optimize the use of its technology rich environment as well as evaluate, prioritize and implement new technologies. The Enabling Technology Strategies are aligned with citizen's priorities identified in the annual Ipsos Reid Citizen Satisfaction Survey, as well as the City's Corporate Strategic Plan and the other consultation efforts identified below.

I. Process

The process to develop the Technology Roadmap was essentially initiated in 2016 with meetings between the Manager Information and Communication Technology and key business stakeholders to conduct an informal ICT service assessment. The outcome of this process was the realization that a framework, or ICT Roadmap, would position ICT better within the organization, moving the division from a support role who provides reliable infrastructure and systems and responds to issues as they arrive, to a strategic business partner who assists in positioning the business areas is using technology strategically.

In 2017, the development of the Roadmap initiative began with in-depth "Discovery Sessions" with department leads and key staff. These sessions included conversation and analysis about core business functions, existing applications, pain points and desired outcomes. In addition, from October 2017 to early January 2018, staff surveyed community Viewpoint members and citizens to seek feedback on the types of "Smart City" technology that they would like to see implemented, or feel should be a priority for the City to pursue. Attachment 3 includes a summary of results of this survey which included responses from approximately 240 people with wide-ranging thoughts and ideas on technology. And lastly, as young people are among the most frequent users of information technologies, on December 7, 2017 staff met with the Youth Council to gain their perspective on technology and its future use at the City. This session included conversations about the latest trends in technology

and how the City can involve youth in further assessing and implementing technologies. ICT also engaged the assistance of the technology consulting firm Aspyr in order to understand the myriad of evolving technologies and how they may be applied to municipal services.

II. Technology Roadmap Summary

Common themes were extracted from the public consultation to identify six Enabling Technology Strategies and a number of associated Technology Initiatives. ICT then completed and prioritized these initiatives based on the following criteria:

- Staff input during ICT Service Assessment & Discovery Sessions
- Citizen input through Viewpoint survey results
- Youth Council engagement
- Dependency on other initiatives
- Available technologies
- Impact to users
- Cost

The resulting Technology Roadmap is a detailed five-year plan that is based on the six Enabling Strategies and Technology Initiatives. The Roadmap document also includes the details required by ICT staff to evaluate and implement these initiatives over time. Attachment 1 provides a summary of the Technology Roadmap in presentation format, whereas Attachment 2 provides a sample of the type of information included in the document for ICT purposes. The following is a description of each of the Enabling Technology Strategies.

1. Improve Citizen Services and Customer Experience

This strategy includes four main technology initiatives which include expanding the methods of public engagement, providing tools for citizens to give feedback on services, and expanding payment services. Working with Economic Development, Corporate Communications and Engineering and Public Works, the implementation of digital kiosks for tourism promotion, information sharing and digital wayfinding is a priority initiative for 2018. In addition, the development of a mobile Citizen Engagement App, which has been highlighted as a key priority by Council and citizens, will also be initiated in this year. This project will be developed using an incremental build model whereby new components will be added over time rather than releasing a 'final' product that has all its components. This process has a number of advantages including that the initial delivery will be faster and cost less and user feedback on features can be received as they are released. Lastly, this strategy includes expanding ways for citizens to provide feedback on services includes the potential pilot of responsive feedback technology in locations such as City Hall and recreation facilities.

2. **Develop Smart Transportation Solutions**
The use of technology in the transportation sector will continue to impact the way cities need to plan the urban environment, as well as deliver transportation-related infrastructure. An example of this is the autonomous vehicle, which is now being piloted around the world for a variety of different functions and in the future may provide opportunities in a variety of areas (e.g. garbage collection, public transit). That said, in the short-term, the focus of the Technology Roadmap will be to implement initiatives that will assist with current transportation challenges such as congestion, parking and public transit. This includes a potential parking module in the Citizen Engagement App, real-time digital parking availability signage, Park Assist technology which works with vehicle GPS systems, and exploring partnerships with Translink and others. It also anticipates starting to implement the infrastructure required to support global trends in transportation.

3. **Maintain Public Safety and Security**
Current technology trends in public safety are related to the growing use of video analytics to track and predict crowd dynamics in situations such as events and to use this technology to proactively react to potential safety issues. ICT will continue to work with the RCMP and support their needs in crime analytics, as well as proactive use of visual analytics to sustain Coquitlam's level of public safety.

4. **Improve Operational Efficiency and Productivity**
The initiatives under this strategy focus on the utilization of the City's current technology but start to move towards an overarching technology architecture that will provide better workflows, better information and better user interfaces. This strategy includes examining all our existing systems to address users' issues, including automating manual tasks, managing data better through data integration and convergence, and expanding the use of data analytics and location services. It also seeks to position the City and community to adopt new technologies such as virtual reality technologies, predictive data analytics and autonomous vehicles.

   For 2018, a number of initiatives in this category have already been identified in the Council approved Business Plan including delivering the E-Plans project, initiating development application processing improvements, implementing asset management optimization software, process improvements in human resources and payroll and many others identifed in the Business Improvements Work Plan.

5. **Empower Staff to Be Better at What They Do**
While the focus of the previous strategy is to provide technology and data to support City business processes, the focus of this strategy is related to how

employees do their jobs and to ensure the City's workforce has the required knowledge and skills. Improving decision-making through better and more easily accessible information, increasing online collaboration as the City expands its campus of facilities, and ensuring the right technology tools are in place to support staff will be part of this strategy. Another key initiative in this strategy includes the assessment and implementation of a learning management system that not only assists in delivering training across the organization, but manages testing and required certifications.

6. **Migrate Towards a Smart City**
   Coquitlam is using a variety of "Smart City" technologies including a variety of e-services, traffic management systems, led street lighting, solar powered mobile charging station (in pilot), and free public Wi-Fi to name a few. The recent online community survey highlighted some additional initiatives that citizens would like to see implemented including a citizens' engagement app that would be made available on mobile devices. There are also a number of emerging technologies that can provide "smart" buildings, "smart" environments and "smart" transportation which will all be considered as we move forward.

III. Implementation

The Technology Roadmap will have wide-reaching implications that affect every City department as well as the public, and therefore in order to determine the feasibility and/or timing of these initiatives, each one has been assessed based on a variety of factors including: importance to the business area(s), impact, available technology, emerging technology, and potential cost. In most cases, these initiatives will be evaluated over time by an Inter Departmental Steering Committee that was set up after the 2013 ICT Assessment. Should the Steering Committee agree to move an initiative forward, a business case or project charter will be developed and endorsed by the Eteam, depending on the scope of the project. If accepted by Eteam, it would be brought forward for Council approval as part of the annual Business Plan and Budget process.

The Technology Initiatives have been grouped into three timeframes: short-term indicates they will start this year; medium term indicates they will be brought forward as part of 2019 or 2020 business plans; and long-term indicates that these initiatives will be reviewed towards the latter part of the plan.

To support the delivery of approved initiatives, the ICT division is developing a "Project Management Office" methodology. This includes a framework for project delivery based on industry standard project management principles and practices. Each initiative would be managed under the framework of the ICT Project Management Office (PMO) which will include processes to ensure on time and on budget delivery, as well as change and issue management procedures. In addition, the PMO will work with the business areas to identify,

assess and pilot new technologies to ensure the appropriate fit and corporate usefulness. The intent is for ICT to work together with departments to meet their business needs but also maintain an organization-wide perspective.

On an annual basis, ICT will report to Council on the progress of technology initiatives.

IV. 2018 Technology Initiatives

The following provides a summary of the approved Business Plan Priorities and Business Improvement Initiatives that ICT will support for this year:

Technology Related Initiatives	Council Priority
E-Plans Submission	A
Development Application Review Project	A
EPW Asset Management Software Implementation	A
Corporate Website Upgrade	A
PRC Management System Replacement	A
General Local Election Technology Support	A
Smart City Strategy (see below)**	B
Technology Roadmap Implementation (see below)**	B
HR/Payroll Process Reengineering & System Changes	Business Improvement
Self-Serve Invoicing in Accounts Payable	Business Improvement
Contract Management Software Implementation	Business Improvement
Scheduling & Time Capture for PRC	Business Improvement

**Under the Smart City and Technology Roadmap Implementation Business Plan Priorities mentioned above, the following initiatives will be explored:

- In consultation with Corporate Communications, develop a Citizen Engagement App;
- Working with Economic Development, pilot Touch Interactive Kiosks for tourism, wayfinding and public notification;
- In conjunction with Parks, pilot Real-Time Digital Parking Availability Signs at TC Park; expand Wi-Fi to Spani Pool area and TC Park - Lafarge Lake; and continue to pilot solar powered mobile device charging stations;
- In coordination with Recreation, pilot responsive feedback tools in community centres or at events;
- Work with Transportation Planning on transportation initiatives such as "Drive Coquitlam" or Translink partnerships;
- Expand technology that supports a collaborative work environment such as video conferencing and Skype for Business;
- Explore opportunities to improve data integration and information sharing across applications and departments and pilot video analytic software; and

- Position the city to be able to adopt new technology innovation through a number of infrastructure upgrades.

These initiatives will help the City to maximize the use of its systems as well as start the implementation of new technologies identified in the Technology Roadmap.

Financial Implications:

ICT capital projects are included in the annual capital plan and are funded by capital replacement reserves as well as general revenues. Funding is annually directed towards application upgrades and new software, renewal of desktop computers and infrastructure, and telecommunications upgrades. Operating costs associated with new capital are brought forward as part of the budget process.

The projects or initiatives identified in 2018 as part of the Technology Roadmap will be funded by approved capital and operating budgets. Any future initiatives that require new funding will be brought forward to Council for approval through the annual business planning and budget process.

Conclusion:

ICT has developed a Technology Roadmap that is intended to provide direction in the investigation and implementation of technology that will support business priorities over the next five years. This report presents Council with a summary of the proposed Technology Roadmap as well as an overview of the proposed initiatives for 2018. Staff is seeking Council's feedback on the proposed Technology Roadmap in order to guide the prioritization of new initiatives in the future.

Michelle Hunt, CPA, CMA

Attachments:

Attachment #1 – Technology Roadmap Summary (Presentation)
Attachment #2 – Technology Roadmap Initiative Sheet Example
Attachment #3 – Viewpoint Survey Results

This report was prepared by Danny Bandiera, Manager Information Communications and Technology

Technology Roadmap Presentation

Council-in-Committee
February 26, 2016

ICT Current State Assessment

ICT needs to be here

ICT is currently here

Business Partner - Expands the Business
Effective Execution on Business **Projects**, Strategic Use of **Analytics** and **Customer Technology**

Trusted Operator - Optimizes the Business
Effective Fulfillment of **Work Orders**, Functional **Business Applications**, and Reliable **Data Quality**

Firefighter - Supports the Business
Reliable **Infrastructure** and IT **Service Desk**

Unstable - Struggles to Support
Inability to Provide Reliable Business Services

What is a Technology Roadmap?

- A Technology Roadmap is a high level strategic plan that determines how technology will support Coquitlam's Strategic Plan and help drive the successful implementation of the City's business plan priorities over the next 5 years.
- Common themes were extracted from the consultation process to identify 6 Enabling Technology Strategies. Each of these strategies are supported by Technology Initiatives.
- The Initiatives have been prioritized based on a number of criteria for consideration and potential implementation over the next 5 years.

Six Enabling Technology Strategies

Externally Facing Strategies

Internally Facing Strategies

Six Enabling Technology Strategies

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Deploy touch interactive information kiosks to expand public engagement.

Deploy a citizens' engagement mobile app to connect people to the City.

pay Pay

Align payment options with current trends to improve customer convenience.

Improve citizen services & experience

Implement responsive feedback tools to improve citizen services.

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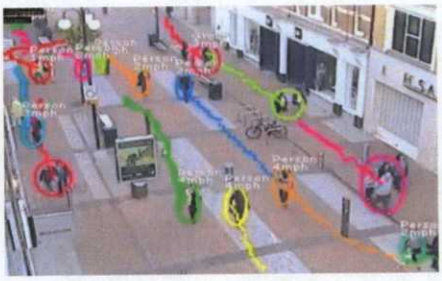
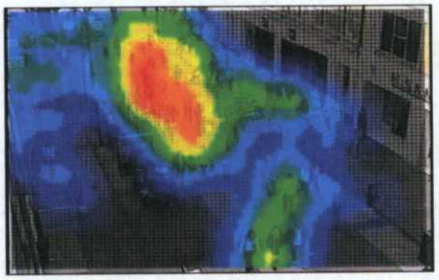


Maintain public safety & security



Expand the use of video analytics to create safer and more secure places.

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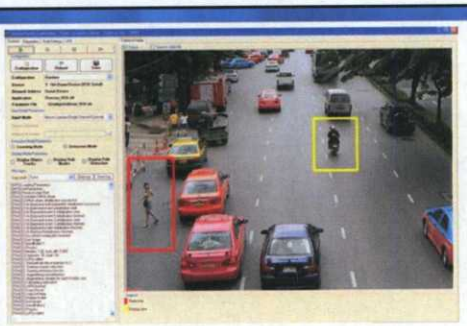
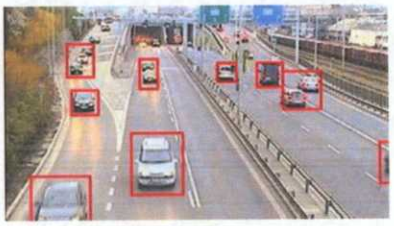
Real-Time Parking Availability Signage



Develop smart transportation solutions



Implement smart transportation technology to help get people to where they want to be

Use traffic analysis to create a safer environment for pedestrians, cyclist and motor vehicles.

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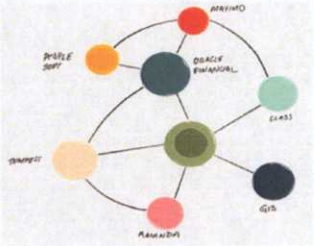


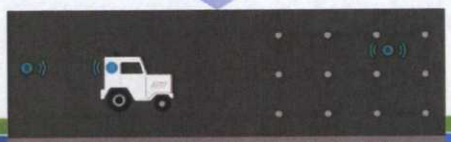
Explore opportunities to improve data integration and information sharing across applications and departments.

Automate manual tasks and workflows to save time.

Position the City to adopt new technology innovation (e.g. Virtual Reality Technology)

Migrate towards data convergence to provide a single framework of information.

Improve operational efficiency & productivity



Deploy Real-time Location Service to better manage City assets and resources.

Improve planning and decision making by implementing data analytics solution

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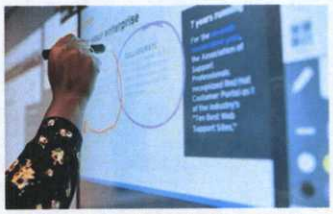
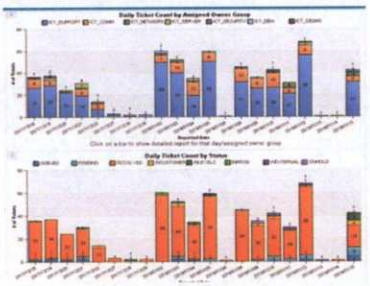


Employ technology that supports a collaborative environment.

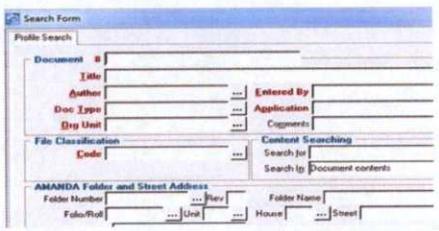
Deploy Expand the use of productivity tools to assist staff.

Empower staff to do what they do better



Make information more accessible to staff to assist in workload management.

Support interactive training environments to improve effectiveness of staff training.



Improve usability of existing City systems to improve productivity.

Smart Waste Management

Smart Community Planning

Smart Citizen Services

Migrate Towards a Smart City

Smart Environment

Smart Building Technology.

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Implementation Timeframe

Short Term (1 -2 years)

- Citizen's engagement app
- Touch interactive kiosks
- Digital parking Signage
- Smart transportation Initiatives
- Expand Wi-Fi to public facilities
- Video analytics software
- Productivity tools
- Pilot responsive feedback tools

Medium Term (2-3 years)

- Data integration and information sharing
- Automated workflows
- Real-time location services
- Payment options
- Collaborative meeting technologies
- Traffic analysis software

Long Term (4-5 years)

- Smart waste management
- Smart building technology
- Smart transportation
- Smart planning
- Smart environmental monitoring
- Predictive data analytics

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Implementation Approach

Evaluation of Initiatives performed by Inter-Departmental Working Group Steering Committee (annually)

Project Charter created by ICT for agreed upon initiatives and reviewed by Eteam, where necessary

Presented to Council as part of the annual Business Plan and Budget process

ICT Project Management Office (PMO) will be responsible for delivery of initiative with support from business area

Annual Progress Report to Council

Resourcing

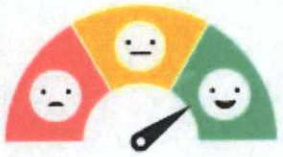
- Funding for 2018 initiatives are included in existing Capital and Operating budgets
- Funding for 2019-2022 initiatives will be requested through the budget process

2018 Key Initiatives

- **Council Business Plan Priorities**
  - Electronic Plans Management Program Implementation
  - PRC Management System Replacement
  - Asset Management Software Implementation
  - Development Application Process improvements
  - Corporate Website Update
  - Business Improvements work items
- **2018 Pilot Initiatives**
  - Interactive Digital Kiosks
  - Real-time Digital parking - TC Park
  - Solar Powered Charging Station for mobile devices
  - Skype for Business-video conferencing
  - Video Analytics software
  - Transportation initiatives
  - Tablets at point of service

Next Steps

Thank you!



Questions and feedback

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Technology Initiative Sheets

The following section describes technology initiatives proposed for the City of Coquitlam supporting the Enabling Technology Strategies described above. Each sheet describes a technology initiative supported by several aspects.

The aspects of each technology initiative are described on this legend sheet.

Technology Alignment:

Technology alignment chart indicates how many technology strategies the initiative is aligned with. Primary aligned strategies are visible. Strategies with secondary alignment are faded.

The more aligned strategies, the stronger the initiative.

What?

This section describes at a high level what the technology initiative is.

How?

This section describes at a high level an approach to implementing the technology initiative.

Illustrative Concepts or Use-Case:

This section contains images that act as examples or illustrative examples of the technology initiative concept or illustrative use-cases for the technology initiative.

Organizational Impact:

This chart describes what level of the organization the technology initiative impacts. Levels that are impacted are visible, levels not impacted are shown as faded shapes.

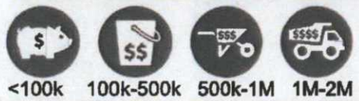
Importance

This chart indicates the level of importance of technology initiative in assisting with the project success.

When

This chart illustrates the projected time line of the initiative.

Budget Impact:



These icons indicate the high level budgetary CAP-EX assessment.

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Smart City Survey Report

January 18, 2018

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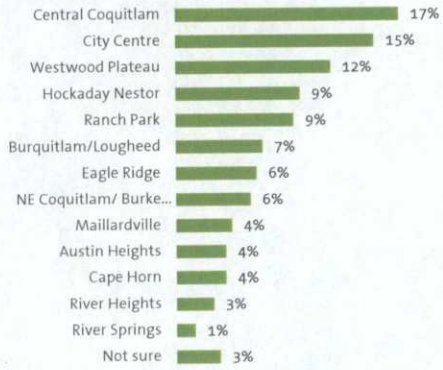
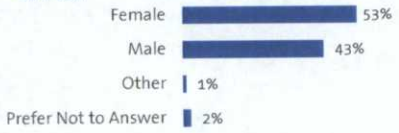
Profile of Survey Participants

City of Residence: 99% of survey participants live in Coquitlam

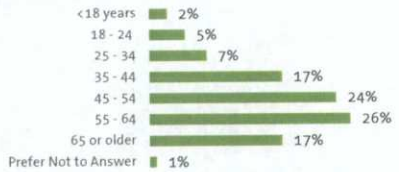
Coquitlam Neighbourhood



Gender



Age Range



Total participants: 150-215

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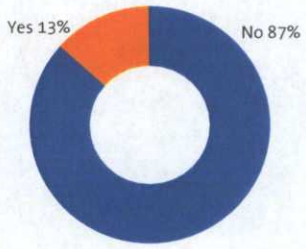
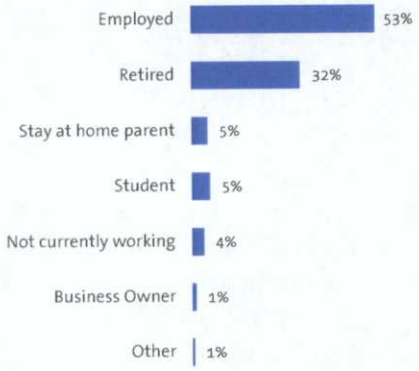
Profile of Survey Participants

Work/Operate a Business in Coquitlam



Status



Total participants: 150-215

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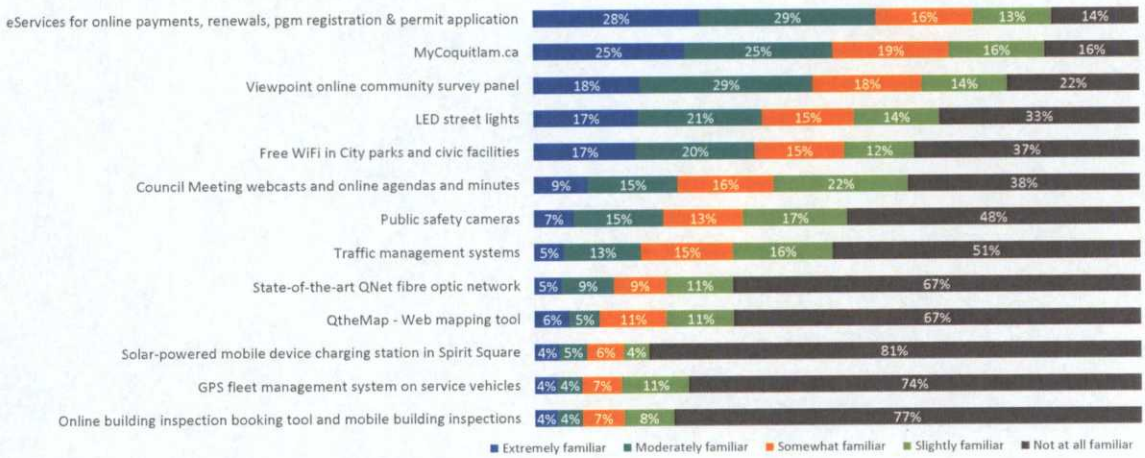
Familiarity with Coquitlam's Existing Smart City Initiatives



Q: How familiar are you with Coquitlam's existing Smart City initiatives? [Sorted by Top 2 box]
Total participants: 245

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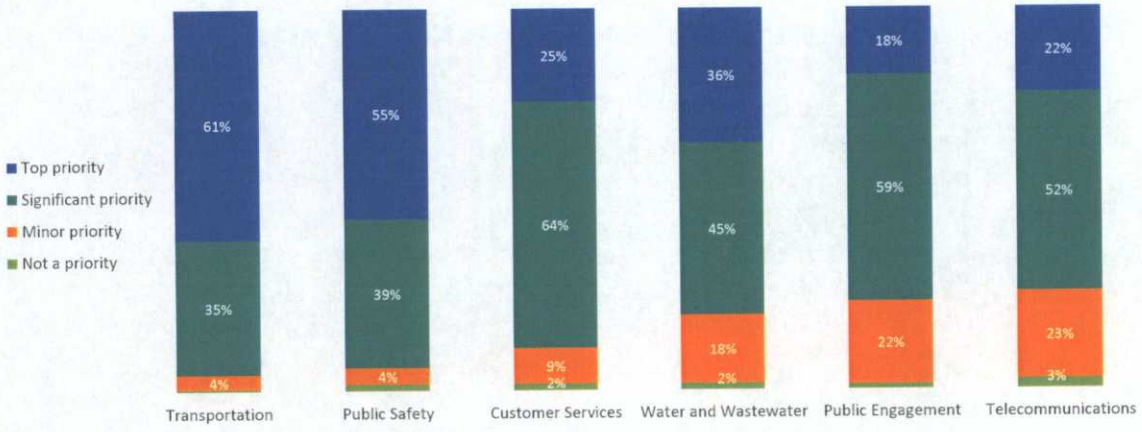
Level of Priority for Focus Areas



Q: What level of priority do you feel Coquitlam should assign to the following focus areas when considering Smart City technologies? [Sorted by Top 2 box]
Total participants: 236

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Other Priority Areas

Priority Areas	Description/Examples
Infrastructure	The road network, traffic management and public transportation system needs to keep pace with development
Waste Management	Public education programs Broaden range of materials that can be recycled locally More user-friendly ways to report missed garbage/recycling collections etc.
Public Parking	Street parking payment systems Parking violations
Environmental Protection	Wildlife management Forest fire alerting and management
Energy	Hydro and electric consumption Solar power initiatives

Q: Are there other priority areas that Coquitlam should focus on when considering Smart City technologies?
Total participants: 53

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Importance of Benefits when Considering Smart City Technologies

Q: How important are the following benefits when considering Smart City technologies? [Sorted by Top 2 box]
Total participants: 230

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Other Important Benefits to Smart City Technologies

Participants mentioned benefits such as:

- Improving the quality of life of residents through more accessible and efficient services;
- Developing a stronger sense of community and connectedness;
- Improving the perception of the City as a desirable place to live, work or operate a business.

Q: Are there other important benefits to Smart City technologies?
Total participants: 22

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Ideas from Other Communities

Idea	Description/Examples	Reference
Wi-Fi	"Coquitlam Go Wi-Fi" at the City's parks, free Wi-Fi access at libraries, recreation centres and on the skytrain.	Brisbane, Dubai, Singapore, Manitoba
Traffic Monitoring and Management	Advanced notice to emergency and maintenance services of incidents and areas to avoid; better integration of bike lanes with roads.	Seattle
Accessibility	Public bike share programs, increased walkability though connected trails and more bike paths.	Vancouver, Whistler
Waste Management	Reduce/reuse household waste e.g. recycling for glass and plastic bags, reduce paper skytrain passes.	Maple Ridge, Hong Kong
City Services	App for reporting issues/problems to City, expand QNet, single account to access services online, encourage 'Smart Region' idea to promote more collaboration between municipalities.	
Public Transit	Free travel, cheaper transit for youth and improved bus services.	San Francisco, Queensland Australia

Q: What ideas have you seen in other communities that you feel we should also consider for Coquitlam? (Please specify the city/community.)
Total participants: 69

Ideas from Other Communities (cont'd)

Idea	Description/Examples	Reference
Community Connectedness	Small neighbourhood businesses, community gardens, block parties and multi-cultural events.	
Energy	Underground power lines, greater use of solar power and solar powered sidewalks.	
Seniors	Designated senior-friendly cities (e.g. longer crosswalk time, easy to read signage, better street lighting etc.) and more services and housing for Seniors.	New Westminster
Safety & Security	More CCTV, city-wide Blockwatch program.	
Electric Vehicles	Purchase incentives, more charging stations.	

Q: What ideas have you seen in other communities that you feel we should also consider for Coquitlam? (Please specify the city/community.)
Total participants: 69