SMRTCTY

Master Plan.

A Smart City for Everybody

MISSISSAUGA

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Smart City Master Plan
Prepared for the
City of Mississauga June 2019

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1. Acknowledgements

We would like to thank all the residents, stakeholders and organizations that participated by providing input through our various consultation events. We truly appreciate your time and input. We would like to thank all City staff who contributed directly and indirectly to the completion of this Plan. This Plan would not have been possible without your assistance.

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Karen Ras, Ward 2
Chris Fonseca, Ward 3
John Kovac, Ward 4
Carolyn Parrish, Ward 5
Ron Starr, Ward 6
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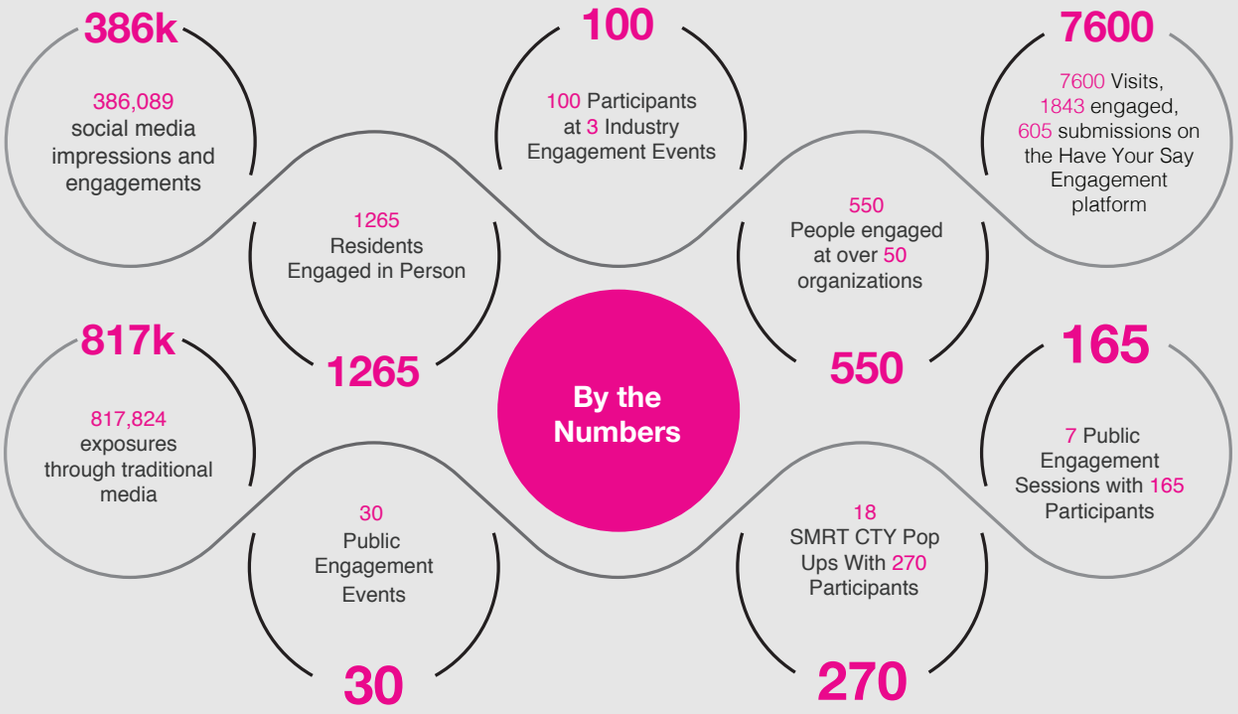
External Stakeholders
Public and Industry engagement was an integral part of the Smart Cities Challenge and Smart City Master Plan. A Communication and Engagement Plan was developed in consultation with Strategic Communications which provided opportunity for in person and digital engagement as well as several public meetings and open house. The following infographic provides an overview of the participation from the public, agencies and the private sector informing the Smart City Master Plan and creating new and lasting relationships and partnership opportunities.



What We Heard from You

"I thank them for the invitation and it's a big gesture of inclusion of the citizens to engage."

"Great event will return for future events!"

"This is a good direction for the community"

"People stay where they have a say, I want to thank the City of Mississauga for including our vote for the Smart Cities Challenge"

SMRTCTY

is for seniors like Rose.

Rose is an active and engaged senior. Her mobility has been declining but that has not slowed her down. With wheelchair charging stations set up in public spaces throughout the city Rose never has to worry about running out of juice as she gets on with her day. She also loves being able to download digital books that she can discuss with her book group each week.

These personas were designed to give insight into Smart City initiatives. They are not based on real people.

2.
Introduction

SMRTCTY

2.1 Vision Statement

Mississauga will harness the creative power of technologies and innovative ideas to enhance the quality of life in Mississauga. We will effectively integrate physical, digital and human systems in the built environment to deliver a sustainable, prosperous and inclusive future – a Smart City for Everybody!

2.2 Overview

Mississauga's Smart City initiatives are about transformational city building and will focus on creating vibrant, inclusive communities with a high quality of life. Mississauga will serve as a model of government-led smart city urban development. People-centred, neighbourhood-focussed and forward-ready we will use technology to address urban opportunities and challenges in order to create a city where people choose to live, work and play.

Mississauga's Smart City includes digital initiatives such as Wireless Mississauga (free public Wi-Fi); digital services through the city's website, apps and other platforms; computer access and Maker Spaces at our libraries; and many other tools and services. As a young city, Mississauga has had an opportunity to build technology into our infrastructure, systems and processes in tandem with the rise of digital technology in our society. We also value the social, cultural and economic implications of digital technologies and how they shape our communities.

The Smart City Master Plan provides a framework for how The City of Mississauga will approach digital projects, engage with the public and look at digital transformation. It also launches the Smart City program that will provide ongoing initiatives, public engagement, and thought leadership around digital modernization and smart city technologies.

The outcomes we are looking to achieve are ambitious - to enable a sustainable and desirable city, where people feel empowered, safe, healthy and happy. At the core, Mississauga's Smart City initiatives are about creating A Smart City for Everybody. We believe that when everyone wins we all win.

SMRTCTY

is for students like Amira.

Amira is a Communication, Culture, Information & Technology major at University of Toronto Mississauga (UTM). In this program she had the opportunity to visit the HRO Forest Products Research Institute in Asahikawa, Hokkaido, Japan and to host a student from the National University of San Marcos in Peru. Both students were able to log on to eduroam, a secure, free internet connection developed for the international research and education community, provided by the City of Mississauga. Amira lives in Downtown Mississauga and takes the bus to school everyday. She is able to access free wifi on the buses, which has helped as she is able to fit in a few more minutes to review information for tests on her way to school. The Central Library and its wide ranging digital services has also helped support Amira. She is able to book rooms and equipment for group projects, take online and in-person workshops and courses, like Lynda.com, to help with her digital skills, and has found it a great place to get her studying done.

These personas were designed to give insight into Smart City initiatives. They are not based on real people.

3.
Executive Summary

SMRTCTY

Smart City in Context

Cities around the world are embracing Smart City technologies. Canada is behind some of the more advanced cities such as New York, Barcelona, Columbus, and Shanghai. Countries such as Estonia and Singapore are leading the pack with comprehensive, statewide digital integration. National programs such as Infrastructure Canada's Smart Cities Challenge are helping small, medium and large communities to push forward for their digital transformations. Most major cities across Canada have Smart City initiatives and other programs that advance municipal government's digital capacities.

Background

On July 5th, 2017 City of Mississauga Council endorsed City participation in the Federal Government's Smart Cities Challenge which saw over 130 cities across Canada compete for prizes ranging from $5 million to $50 million in onetime funding. The City of Mississauga was in the $50 million category and developed a comprehensive and consultative submission focussed on Social and Economic Resilience. While the City was not successful in winning the Smart Cities Challenge the public process and engagement formed the foundation to develop a Smart City Master Plan. The City of Mississauga's submission focussed on Empowerment and Inclusion and Economic Opportunity which across Canada made up over 50% of the applications submitted. It is clear that digital inclusion and equitable employment are top of mind across Canada.

Mississauga's submission was used as the backbone for the Smart City Master Plan and incorporated all the learnings including research, expert, community and stakeholder feedback.

The development of the Smart City Master Plan builds on the research and community feedback from this application, and also from the success of strategies and projects across the organization as technology becomes more integral to all city departments. Locally and globally, digital technologies continue to be on the rise and we assume that the future of cities will be digital for many years to come. Smart City will enable Mississauga to maintain a clear vision of the future of this great city.

Public Engagement

The Smart City Master Plan (SCMP) was prepared in consultation with internal and external key stakeholders with the objective to create a 10 year vision for the City of Mississauga. The plan is formed based on benchmarking and best practice research completed by staff and the Canadian Urban Institute.

Public and Industry engagement was central to the consultative and collaborative process. Through the Smart Cities Challenge and Master Plan consultations:

- Over 30 public events
- 5 industry events
- 18 SMRTCTY pop-up events
- Over 100 meetings with external stakeholder groups
- Over 817, 824 people were reached through traditional media sources along with many publications in local and industry magazines and webcasts

Having a strong Communications and Engagement Plan and a strong brand "SMRTCTY" has positioned the City of Mississauga as a recognized leader with a stronger reputation locally and globally. The results through social media and the reach of SMRTCTY notices and publications is a tribute to the contributions of Strategic Communications.

Current State

Mississauga is already a Smart City. Mississauga has been developing digital infrastructure and services for many years. This includes an extensive communications fibre network (PSN), an Advanced Traffic Management System, Wireless Mississauga at over 70 locations, and over 150 online services.

This strong digital ecosystem enables Mississauga to move forward with further integration of technology into our planning processes and to explore new ways to work alongside citizens to continue to create a dynamic and inclusive city.

Digital Transformation

Understanding the difference between Information Technology (IT) and Smart City is essential for understanding this Smart City Master Plan. In a municipal context, IT has traditionally been a support for internal staff, along with a few forward facing projects such as websites and online services. Smart City shifts digital into the public realm including infrastructure, transit, street furniture, public facing services and programs. This is a fundamental change and is the driving force behind the Smart City movement. Mississauga has created a tool called the Smart City Lens to help focus digital projects and manage keys issues such as:

- A greater need to engage with the public when introducing technology into the public realm maintaining public trust and government accountability.
- A greater focus on data and privacy as sensors collect unprecedented amounts of data and governments struggle with terms of use and transparency.
- The proliferation of technology, sensors, cables and components in the built environment putting pressure on the city right-of-way and negative impacts of street beautification.
- More opportunity for public private partnerships for innovation and demonstration of technology capabilities in a municipal setting.
- Expectations of digital in the public realm is higher as cities around the world vie for leader status in Smart City and ultimately shape the markets and industry that the cities engage to plan, design and deliver services.
  Goals, Framework, Initiatives

“The future of innovation is no longer in the hands of the scientists, artists or designers alone in a lab, loft or studio. It is a creative, collective humanist enterprise that seeks to find new solutions to the problems of our planet and its future.” – Lucas Dietrich

The Smart City Master Plan will be guided by a set of Goals, a new Smart City Framework and a Policy that provides governance over Smart City planning. A fundamental and overarching goal is to ensure that a “Smart City is for Everybody” with specific goals defined that will be used to assess and measure the impact of Smart City initiatives as follows:

Smart City Goals

Focus on People – inclusive, embrace creativity & innovation creating opportunities for social resiliency and digital literacy.

Focus on Economy – enable local and global interconnectedness, entrepreneurship & innovation, economic opportunity and procurement innovation.

Focus on Living – identify and affect positive change for safety, health & wellbeing, equality, cultural and social vibrancy providing a better quality of life.

Focus on Mobility – support mobility that provides freedom of movement, active transportation, and future oriented multimodal with integrated technologies improving access and choice.

Focus on Environment – support solutions that provide green energy, low/no carbon mobility, climate change mitigation & adaptation and green urban planning.

Focus on Government – be open and transparent, efficient and accessible through the use of digital services and technologies that improve customer service.

Smart City Framework

Future Ready – trends and foresight driving digital transformation

Open – digital inclusion, open engagement, transparent, respectful of privacy

Collaborative – harness the power of innovation through a "public call for innovation"

Everyday – recognizing what is working well now; telling the story

Data Centric – responsible, innovative and efficient use of data

Connected – digital infrastructure, systems and processes that span the City

Smart City Strategies & Actions

Mississauga is a City of the Future

Being Future Ready is about being prepared in order to lead, to support and to prepare for a bright future for Mississauga.

Mississauga is a Place for Civic Curiosity

Living Labs -- Living Labs are common in Smart Cities throughout the world. In these spaces the city is able to test new technologies on a trial basis in a real-life context with a user-centred approach.

Innovation Challenges -- With our partners at EDO, we will be developing a model for innovation challenges that will both help to solve local issues but also provide opportunities for local entrepreneurs to test out new ideas and connect with the city.

Centre for Civic Curiosity -- The Centre for Civic Curiosity is a roving engagement hub where the public can come and explore, learn, connect and contribute to the future of their city.

Mississauga is A Smart City for Everybody

Citizen Centred Smart City Policy -- Delivering a citizen centred approach to data policy is a primary concern for Mississauga's Smart City. This policy will address these needs, along with an increased awareness of data privacy and security.

Digital Inclusion -- Digital Inclusion refers to the activities necessary to ensure that all individuals and communities, including the most disadvantaged, have access to, opportunity to use, knowledge, and skill with digital technologies.

Civic Technology -- Civic Technology are digital projects that enable higher levels of engagement, customer service and help to enhance the relationship between citizens and their government.

Smart City Governance

Smart City Principles and Policy--The creation of the Smart City Policy will include the co-creation of Smart City Principles with the public to ensure a perspective where the interests and opinions of citizens are instrumental in defining expectations and setting priorities. This set of Smart City Principles will become the backbone of the Smart City Policy that will guide Smart City decisions.

Smart City Steering Committee --The Smart City Steering Committee will be a cross-departmental team that will guide Smart City projects.

Implementation

The Smart City Master Plan provides a 10 year outlook and will be directed by the following:

- The Smart City Goals will be the basis for measurement tools for Smart City initiatives
- The Smart City Framework will guide the direction and set the basis for Smart City processes
- The Smart City Master Plan aligns with strategic processes across the organization that will work in tandem with Smart City projects
- A series of actions and processes are outlined in the Appendix of this document. The Information Technology service, home to the Smart City team, will both lead on projects and provide an advisory and educational role throughout the organization on other projects.
- This master plan is intended to be a living, agile document that is intended to keep in line with changes in technology, public and social expectations.

Smart City projects will be measured and tracked through a variety of tools including:

- Achievements and Technology sections of the Annual Business Plan and Budget
- Annual Smart City Master Plan progress reports
- Global, national and regional benchmarking
- Against the goals of the Smart City

Financing the Smart City Master Plan

Business Planning Cycle --Smart City projects will be incorporated into the current Business Planning and Budget process, which is overseen by Mississauga City Council. Most smart City projects will be part of these annual budgets with Service Areas taking the lead as part of their annual Business Plans. In addition to annual Business Planning requests, Smart City projects may also be financed through the following:

- External funding such as grants
- Public Private Partnerships
- Institutional or Community Partnerships

Innovation Challenges

Innovation Challenges will also require a small innovation fund to ensure that adequate resources are available to contribute to the co-creation or innovation of the challenge. Innovation Challenges and pilot projects will be public procurements at a small scale and will create an opportunity for partnerships. These innovation challenges will help to de-risk technology projects by providing opportunities to prototype projects prior to implementing medium and large scale projects.

Resourcing the Smart City Master Plan

Implementation of the Smart City Master Plan will require dedicated staff. This staff will develop the Smart City program and manage the complex Smart City projects and relationships required for a Smart City. The required resource will be identified through the Business Plan and Budget process.

SMRTCTY

is for parents like Steve.

Steve has had a rough few years and is doing his best to get back on track. Between shift work and being a single parent it is difficult for him to afford a computer and a data plan, and even more difficult to get to the library during their open hours. Through our partners at the United Way and Mississauga Libraries, Steve has been able to have a long term laptop and data loan that he can upgrade his skills on and his kids can use for their homework.

These personas were designed to give insight into Smart City initiatives. They are not based on real people.

4.

Smart City Overview

SMRTCTY

4.1 A Day in the Life of a Mississauga Family: A Foresight Scenario

Foresight scenarios are a planning tool used to help imagine how new technologies will affect our day-to-day lives. This scenario depicts a day in the life of a family in a smart city. Some of the technologies depicted below are already in Mississauga, some are planned and some are upcoming trends.

The alarm goes off. Jacinta wakes up and sleepily asks her voice activated AI assistant what the weather will be like today. "Good morning Jacinta! It is sunny and 25 degrees outside," the AI assistant says. Perfect day for a bike ride. She uses the AI assistant to book her a city bike as they are often all taken by the time she gets there. She nudges her husband to get up and reminds him that it is their son's turn to take out the garbage.

Mohammed wakes their son, Phil, and reminds him about his chores. "Five more minutes, dad…" he mumbles in his sleep, "I don't think garbage pick-up is today." Mohammed asks the Artificial Intelligence (AI) device to connect to the city's 311 service and asks about garbage pick-up days. As the AI cheerfully confirms that today *is*, in fact, a garbage pick-up day, Mohammed nudges his son to get a move on.

As he is grabbing a quick breakfast, Mohammed checks his city app to see where he can plug in his electric vehicle close to where he will be meeting his clients that day. The app also shows him the quickest route and how to avoid any road construction. Jacinta uses this time to sign their daughter April up for drawing lessons at a local community centre and to download some e- books she has been meaning to read.

Phil drags the garbage to the curb and then goes to wait with his friends for the autonomous shuttle that will take them all to school. April trails behind reluctantly. They both use the free Wi-Fi at the bus stop and on the shuttle. Phil to text his friends. April to play games and look up facts about giraffes, her favourite animal.

While at work, Jacinta and Mohammed get a text reminder about a local meeting about a new development in their neighbourhood that night. They are directed to a variety of digital tools that will help them make an informed decision about how this new building will impact their street. This includes an Augmented Reality (AR) app that they can use to clearly visualize, in 3D, how the new structure will look and feel.

After dinner they start the long process of tucking April into bed. April negotiates three stories from her parents and two more from the AI assistant that is part of a library program that reads bedtime stories from their collection.

Phil and his friends received texts saying that the basketball court they had been waitlisted for at their local park had an opening slot for tomorrow. They sent back their confirmation and invited a few more friends to join them.

Mohammed worked on an online course that the city's small business centre offered to upgrade his skills while Jacinta wound down for the night by watching a streaming movie on the Mississauga Library's website.

Technologies Used in This Scenario:

++ Smart City Technologies Used in This Scenario: customer Service Artificial Intelligence (AI) assistant; bike share digital sign up; digital waste delivery schedule; electric vehicle (EV) charging station; city app for avoiding road construction; online services for recreation programming ; online services for library e-books; autonomous shuttle school bus ; free public wifi ; public engagement text service; digital planning tools such as augmented reality (AR) and 3D modelling; Artificial Intelligence (AI) library bedtime reading program ; Automatic recreation booking tool including text reminders ; Online business course offered by Economic Development ; Streaming Library movie service

4.2 Smart City Definition

While the 1960's saw the first use of digital data for use in urban planning in cities like Los Angeles, the term Smart City in its current iteration was first coined in the late 1990's. As with any growing field of work, there are many definitions. The one we use is:

"A Smart City is the effective integration of physical, digital and human systems in the built environment to deliver sustainable, prosperous and inclusive future for its citizens"
- British Standards Institute (BSI)

For the City of Mississauga a Smart City is one that uses technology to support the people that live, work and play in Mississauga. This includes digital initiatives such as Wireless Mississauga (free public Wi-Fi); digital services through the city's website, apps and other platforms; computer access and Maker Spaces at our libraries; and many other tools and services. As a young city, Mississauga has had an opportunity to build technology into our infrastructure, systems and processes in tandem with the rise of digital technology in our society. We also value the social, cultural and economic implications of digital technologies and how they shape our communities. In Mississauga, Smart City technologies will be used to support a better quality of life

4.3 Why a Smart City Now?

Cities around the world are embracing smart city technologies. Canada, as a whole, has been a bit slower to catch up to some of the more advanced cities such as New York, Barcelona, Columbus (Ohio), and Shanghai. Countries such as Estonia and Singapore are leading the pack with comprehensive, statewide digital integration. Canada is, however, ramping up. Most of the major cities across Canada have smart city initiatives, innovation labs and other programs that advance municipal government's digital capacities. National programs such as Infrastructure Canada's Smart Cities Challenge are helping small, medium and large communities to push forward for their digital transformations.

Since its inception as a city in 1974, Mississauga has grown to be one of Canada's largest cities, and one of its most diverse. This diversity of people with their multitude of ideas and experiences is one of the greatest strengths of our city and, moving forward, will contribute greatly to Mississauga as a Smart City.

Understanding the difference between Information Technology (IT) and Smart City within the context of this plan is essential and central to the need for a Smart City Master Plan. There has been a significant shift from back-office technology implementation and online services to the full integration of technology into the public realm. This shift includes changes in infrastructure, planning, processes, tools, systems and the social realm. This shift from being an internal support system to an ecosystem that spans internal and external systems is a fundamental change. It is the driving force behind the Smart City movement and requires the following:

* A greater need to engage with the public when introducing technology into the public realm maintaining public trust and government accountability.
* A greater focus on data and privacy as sensors collect unprecedented amounts of data and governments struggle with terms of use and transparency.
* The proliferation of technology, sensors, cables and components in the built environment putting pressure on the city right-of-way and negative impacts of street beautification.
* More opportunity for public private partnerships for innovation and demonstration of technology capabilities in a municipal setting.
* Expectations of digital in the public realm is higher as cities around the world vie for leader status in Smart City and ultimately shape the markets and industry that the cities engage to plan, design and deliver services.

A Smart City Master Plan creates a new model for reviewing technology implementation with a Smart City Lens and will benefit the planning of City Services in how technology is replaced

through normal Lifecycle replacement and introducing new technologies now known as Smart City. Assessing and piloting emerging technologies to better understand and de-risk capabilities of technology such as Augmented Reality, Autonomous Vehicles and Artificial Intelligence is a responsible position to take. The City of Mississauga will maintain a reputation of being innovative in the use of technology as well as being well informed before investing in leading edge Smart City technologies founded by the principle that improving quality of life is an overarching goal.

4.4 Benchmarking

Cities around the world are embracing Smart City technologies. Canada is behind some of the more advanced cities such as New York, Barcelona, Columbus, and Shanghai. Countries such as Estonia and Singapore are leading the pack with comprehensive, statewide digital integration. National programs such as Infrastructure Canada's Smart Cities Challenge are helping small, medium and large communities to push forward for their digital transformations.

Most major cities across Canada have Smart City initiatives and other programs that advance municipal government's digital capacities. The City of Mississauga's Smart City Challenge submission focused on Empowerment and Inclusion and Economic Opportunity which, across Canada, made up over 50% of the applications submitted. It is clear that digital inclusion and equitable employment are top of mind across Canada.

Mississauga has an opportunity to participate in the WCCD ISO Standard for global Smart Cities. This is a new standard that will enable Mississauga to benchmark against cities worldwide.

4.5 Smart City Context and Trends

Technology, innovation and diversity have a long history here. With 10,000 years of human activity on this land, Mississauga has seen many technological changes from its earliest inhabitants, the Anishinaabe, Haudenosaunee, Wyndot and Huron people, through to the Mississaugas of the New Credit First Nation, to the European settlers and recent waves of peoples from all over the globe. Since its inception as a city in 1974, Mississauga has grown to be one of Canada's largest cities, and one of its most diverse. This diversity of people with their multitude of ideas and experiences is one of the greatest strengths of our city and, moving forward, will contribute greatly to Mississauga as a Smart City.

The development of the Smart City Master Plan builds on the success of strategies and projects across the organization as technology becomes more integral to all city departments. Locally and globally, digital technologies continue to be on the rise and, we assume, that the future of cities will be digital for many years to come. Smart City will enable Mississauga to maintain a clear vision of the future of this great city.

As cities continue to adapt and engage with new technologies three stages of growth have become apparent:

Smart Cities 1.0 - Technology Driven. In these instances the technology solutions are led by industry and are primarily focused on the technologies themselves without effectively looking at the interactions between cities and their citizens.

Smart Cities 2.0 - Technology Enabled, City Led. The second stage is where governments become more active in leading the process to ensure that the technologies support a higher quality of life for their citizens, businesses and visitors.

Smart Cities 3.0 - Open Smart Cities. Recently a new trend has been emerging with citizens taking a more active role in co-creating their Smart City. These projects tend to centre on the cultural implications of Smart City technologies with a focus on ethics, transparency and people.

The City of Mississauga is in transition from Smart Cities 2.0 to 3.0 with a strong and demonstrated digital transformation of City Services and Operations supported by the IT Master Plan and Technology Road Maps for each service. The City has been very proactive in engaging the public through the Strategic Plan and Master Plan process which positions the City well as it moves into Smart Cities 3.0 where a higher level of engagement and transparency is expected with digital technologies in the public realm.

As a city that has been developing digital infrastructure and services for many years, Mississauga is able to move forward with further integration of technology into our planning processes and to explore new ways to work alongside citizens to continue to create a dynamic and inclusive city.

We increasingly live in cities. Recent studies have found that 54% of the world's population currently lives in cities. In 2050, city dwellers will make up 66% of the world's population. With 92% of Ontarians using the internet every day, the expectations of businesses being online, the rise of digitally enabled transportation, and the continued rise of digital infrastructure within cities, for a wide variety of uses including data collection and support for marginalized communities, government led Smart City initiatives are inherently about supporting and building neighbourhoods.

Within this context, it is important to look at the technology and the societal impacts. This includes looking at who lives here now, the future of work and current economic opportunities, how do we move around the city in a variety of ways, how are we planning our city and for who, health and the environment, and, of course, how technology can help us now and in the future.

We believe that Smart Cities can sustain, foster and lead initiatives that will support a high quality of life for all Mississaugans and is integral to planning for cities of the future.

4.5.1 Technology Context and Trends

Smart City technologies are shifting rapidly and municipalities around the world are looking for ways to not just keep up but understand the new digital ecosystem. Augmented reality, autonomous vehicles, and artificial intelligence are just a few examples of technologies that will be disruptors. Our Smart City Master Plan creates a new model for reviewing technology implementation including tools such as the Smart City Lens, Innovation Challenges, pilots, prototypes and design thinking methodologies.

4.5.2 Social Context and Trends

Mississauga values the social, cultural and economic implications of digital technologies and how they shape our communities. We will use Smart City technologies to support a better quality of life.

Working alongside our partners such as the Mississauga Library System, Mississauga's Economic Development Team, the Culture Division, Environment team, Planning & Building, the Accessibility team, and many others, Mississauga's Smart City will use technology to support and adapt to changing societal needs. In addition to these internal teams we will also work with a variety of community organizations and institutions to support the people of Mississauga.

Technology is a powerful tool that can help us create a resilient and inclusive society. Smart City will ensure that Mississauga's digital initiatives support this concept.

4.5.3 Key Insights

Technology is changing quickly and will provide opportunities to improve quality of life in the city, and require high levels of digital literacy.

Mississaugans will need to have a high level of digital literacy to navigate the technological changes and the big data they will produce. This will be key to bridging the digital divide and providing opportunities for all Mississaugans.

Mississaugan's are happy with life in the city but the digital divide remains an issue to reckon with.

Mississaugans, by and large are satisfied with their quality of life in the city. They feel connected to their community and are proud of the welcoming and diverse community. However, technology and income disparity remain an issue to be solved.

The economy is strong in Mississauga but global shifts are occurring with technology, the economy and climate change that need to be prepared for.

Mississauga has a strong and varied economy with many head offices, Fortune 500 companies and industrial facilities here, but global shifts in automation, artificial intelligence, robotics and other emerging technologies will require many
to retrain and upgrade their skills.

SMRTCTY

CONTEXT & TRENDS

Technology & Economy

TECHNOLOGY TRENDS

- Artificial Intelligence (AI)
- Tracking & Transparency
- Big Data
- Mobility
- 5G
- Internet of Things (IoT)
- Blockchain
- Automation & Robotics
- Energy Storage & Distribution
- Augmented Reality
- Autonomous Vehicles
- Drones
- Smart Tourism

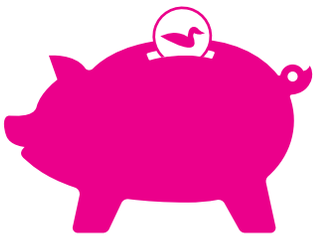
DIGITAL STATISTICS

90%

of Canadians use the internet every day.

ONE BILLION

# of hours people spent on line in 2018.



Global Investment in Emerging Technologies

$173 BILLION
AUTONOMOUS VEHICLES BY 2030

$158 BILLION
SMART CITY TECHNOLOGY BY 2022

$58 BILLION
ARTIFICIAL INTELLIGENCE (AI) BY 2021

$400 MILLION
BLOCKCHAIN 2017 MARKET WORTH

ADOPTION OF TECHNOLOGIES BY COMPANIES 2022

85%	BIG DATA ANALYTICS
75%	APP & WEB ENRICHED MARKETS
75%	INTERNET OF THINGS (IoT)
73%	MACHINE LEARNING
72%	CLOUD COMPUTING
59%	DIGITAL TRADE
58%	AUGMENTED & VIRTUAL REALITY
54%	ENCRYPTION
52%	NEW MATERIALS
46%	WEARABLE ELECTRONICS
45%	BLOCKCHAIN
41%	3D PRINTING
40%	AUTONOMOUS TRANSPORT
37%	STATIONARY ROBOTS
36%	QUANTUM COMPUTING
33%	NON HUMANOID LAND ROBOTS
28%	BIOTECHNOLOGY
23%	HUMANOID ROBOTS
19%	AERIAL & UNDERWATER ROBOTS

Future of Work

75% of the workforce will be mobile by 2020

MISSISSAUGA IS HOME TO OVER 90,000 BUSINESSES EMPLOYING MORE THAN 438,000 PEOPLE.

Mississauga Key Economic Sectors

- **CLEAN TECH**
- **AEROSPACE**
- **LIFE SCIENCES**
- **FINANCIAL SERVICES**
- **INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT)**
- **FOOD & BEVERAGE**

Data Sources: 2018 Global Digital / We Are Social / Hootsuite, Citizen Satisfaction Survey (2017), Statistics Canada, Census profile for Mississauga (2016), City of Mississauga, McKinsey Global Institute Workforce Skills Model, Future of Jobs Survey 2018, World Economic Forum, Your Tech Diet, IDC, Seabury

SMRTCTY

CONTEXT & TRENDS

Social & Cultural

SOCIAL TRENDS

- Social Trends
- Rise of Smart Cities
- Urbanizations
- Digital Divide
- Future of Work
- Income Inequality
- Digital Rights
- Climate Change
- Digital Inclusion
- Affordable Housing
- Human Centred Design
- Urban Agriculture
- Social Inclusion
- Tower Renewal
- Accessibility
- City Intensification

MISSISSAUGAN'S ♥ MISSISSAUGA

89%

of residents rate quality of life in Mississauga either good or excellent

76%

of residents agree that Mississauga is moving in the right direction to ensure we are a dynamic and beautiful global city

Age Demographics 2016 Census Profile

11% Children

13% Youth

20% Younger Adults

29% Mature Adults

18% Older Adults

9% Seniors

DIVERSITY IS OUR STRENGTH

Mississauga welcomed

53,000

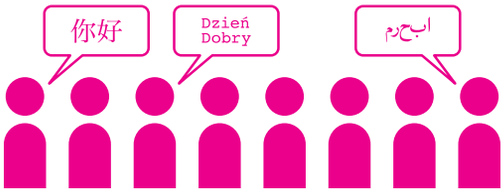
Newcomers between 2011 & 2016

240

Mississauga is home to Cultural Groups

420,000

Mississaugans speak or know a language other than English or French



INCOME DISPARITY

$83,018

average total income of Mississauga households in 2015

58%

make under **$40,000** before taxes

Over

35%

make under **$23,861**

Climate Change

2009 Flood in Cooksville

2013 Extreme Flooding / Wind

2017 Ice Storm

2018 Storm Surge / High Water

2018 Heavy Rain / High Temp

2018 Ice Storm

2018 Wind Storm

Data Sources: 2018 Global Digital / We Are Social / Hootsuite, Citizen Satisfaction Survey (2017), Statistics Canada, Census profile for Mississauga (2016), City of Mississauga, McKinsey Global Institute Workforce Skills Model, Future of Jobs Survey 2018, World Economic Forum, Your Tech Diet, IDC, Seabury

4.6 Strategic Alignment

Mississauga's Smart City Master Plan builds on, and complements, a strong foundation of master plans and strategies from across the organization.

The Strategic Plan - Our Future Mississauga - has directed decision-making for the City of Mississauga since 2009. It is the result of an extensive public engagement process that began in 2007 and connected more than 300,000 people to a conversation about Mississauga's future. It is a fundamental guiding document for the City's priorities and its short and long-term goals strongly support the Smart City Master Plan. The plan's Five Strategic Pillars for Change are move, belong, connect, prosper, and green. Smart city planning supports all of these objectives.

The City's commitment to Smart City solutions and technologies is also evident in other plans across the organization. The Smart City Indicators are People, Government, Environment, Economy, Mobility and Living, which are strong throughout many city strategies. With digital technologies embedded throughout modern cities, there are 27 connected and supporting plans* across the organization that reach across all city departments.

***For a detailed list please see Strategic Connections in the Appendix**

4.7 City of Mississauga Current State

Mississauga is already a Smart City.

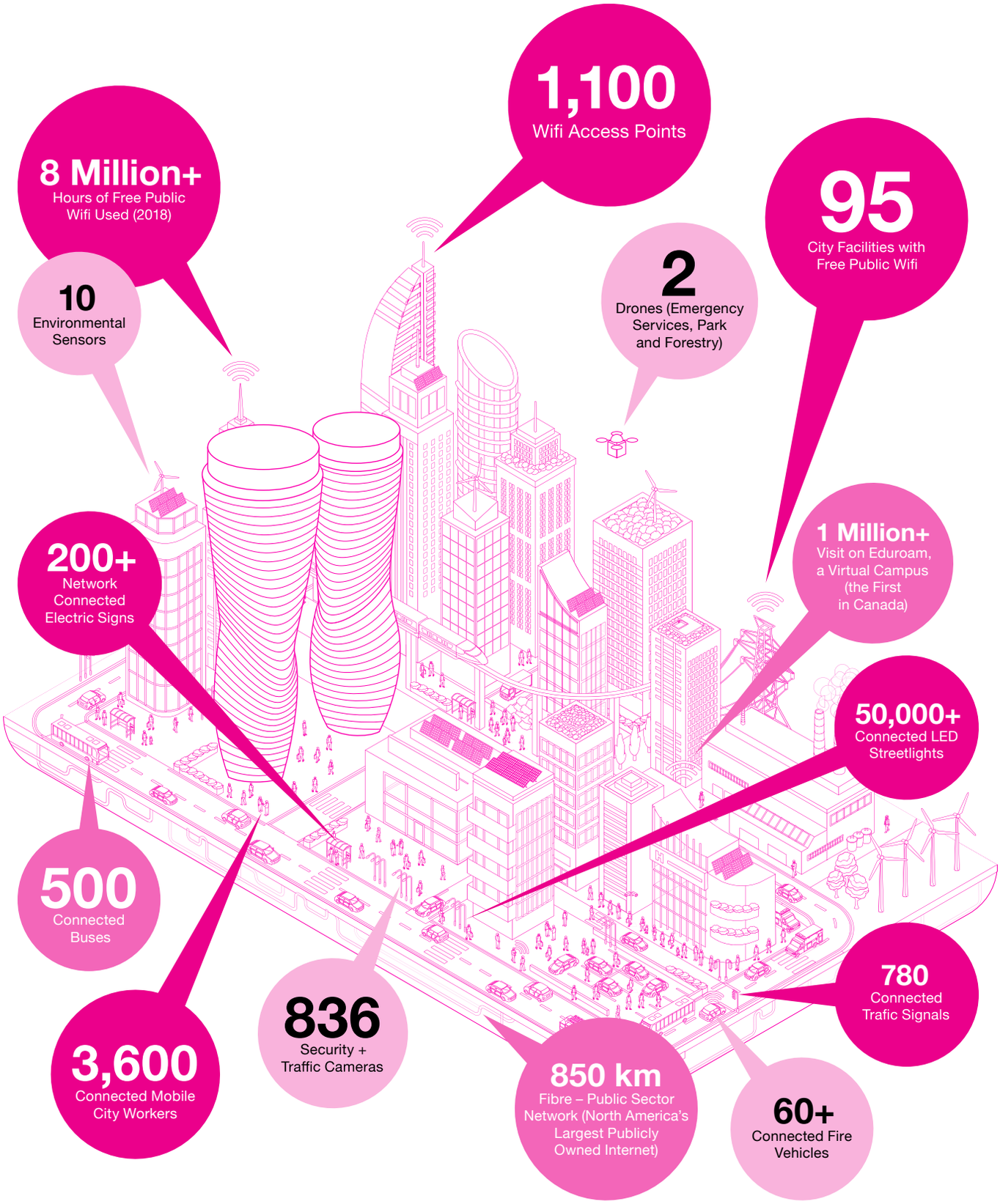
As a young city, Mississauga has had an opportunity to build technology into our infrastructure, systems and processes in tandem with the rise of digital technology in our society. Mississauga is, in many ways, already a 'smart city'. This digital ecosystem ensures that all of Mississauga's neighbourhoods are supported through digital infrastructure, systems and processes. This includes a substantial digital foundation that is often unseen, including North America's largest Public Service Network of communications fibre, city-wide Wi-Fi, an LED lighting grid which saves energy, an Internet of Things (IoT) grid that can help with everything from traffic management to air quality control.

Smart City will use technology to help create a city that is ready for the challenges of today, and prepared for a city of the future.

What does it mean when we say 'Mississauga is already a Smart City'? And as we continue to grow our Smart City what does that look like in the future?

What does it mean when we say
‘Mississauga is already a Smart City’?

Here is where we are in 2019...



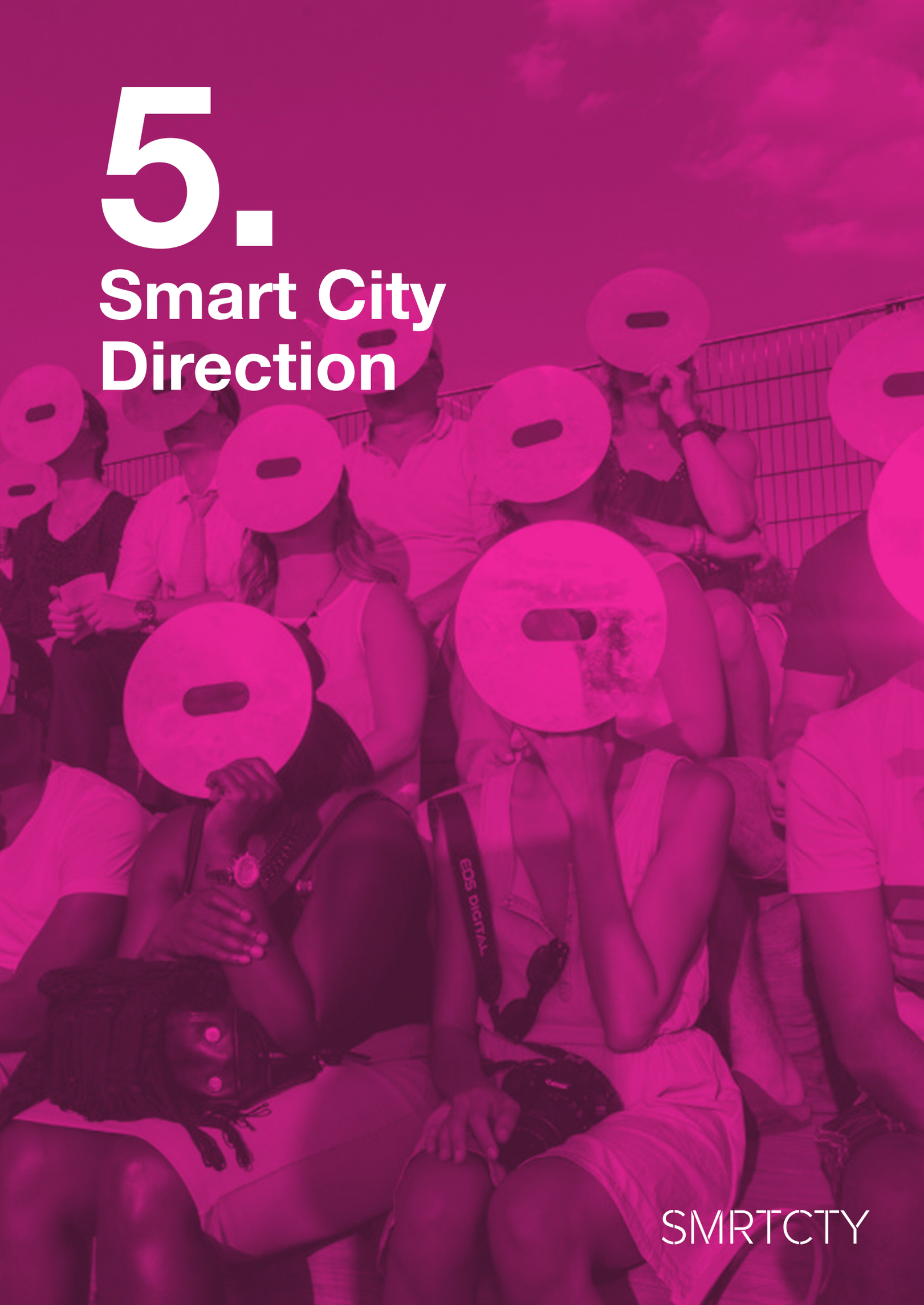
SMRTCTY

is for New Canadians like Akua.

Akua recently emigrated from Ghana and has been struggling to find work, despite his wealth of experience. In order to network, Akua started to attend events offered online and through Mississauga Libraries. Through this network he learned about the Innovation Challenges and became part of a cluster team working on a prototype to help solve a local issue. This gave him Canadian experience on his resume and helped to deepen local connections to the workforce.

These personas were designed to give insight into Smart City initiatives. They are not based on real people.

5.
Smart City Direction



SMRTCTY

5.1 Smart City Governance

What is governance and why is it important?

A basic definition of governance is: how society or groups within it, organize to make decisions. In this case, how does the City of Mississauga make decisions in regards to smart city initiatives. There are three main questions that governance answers:

- 1. Who has a voice in making decisions?
- 2. How are decisions made?
- 3. Who is accountable?

There will be three main forms of governance for Smart City initiatives:

Smart Cities Committee: The Smart Cities Committee will oversee smart cities projects. This committee will be comprised of leaders from across the organization from all four city departments (Transportation and Works, Community Services, Corporate Services, Planning & Building).

Smart Cities Policy: The Smart City Policy will ensure a fair and transparent policy that will direct Smart Cities and city related digital projects. It will be based on Smart City Principles that will be co-developed with the public. This will be an agile document and will be assessed every 3-5 years as technologies and their cultural implications shift.

Ongoing Public Engagement: Smart City has been designed with public engagement as a key feature. Through the Living Labs, Centre for Civic Curiosity and the Innovation Challenges the public will be asked for input on an ongoing basis. This input will be used to inform and direct decisions about Smart City projects.

5.2 Smart City Goals

Quality of life is a key feature for Mississauga's Smart City. The Smart City Master Plan is being developed in order to provide direction for digital initiatives throughout the City of Mississauga. Digital technology moves quickly while the core values that create and support a vibrant, sustainable, prosperous and inclusive Mississauga remain.

The goals below will be used to measure the Smart City initiatives. All Smart City projects will incorporate one or more of these goals. These indicators were chosen to ensure that a human centred approach remains a focus throughout Smart City work.

Focus on People: Smart City projects are Inclusive, Embrace Creativity & Innovation, and create opportunities for Social Resiliency and Digital Literacy.

Focus on Economy: Smart City projects enable Local & Global Interconnectedness, Entrepreneurship & Innovation, Economic Opportunity and work towards Procurement Innovation.

Focus on Government: Smart City projects will be Open & Transparent, be supported by Digital Governance and eGov tools/services, and always strive to be Citizen Centric.

Focus on Environment: Smart City projects will support solutions that provide Climate Change Mitigation & Adaptation through a Low Carbon & Resilient Community, Buildings & Clean Energy, Resilient & Green Infrastructure, Low Emissions Mobility, Accelerating Discovery & Innovation, Engagement & Partnerships

Focus on Mobility: Smart City projects support mobility that provide Freedom of Movement, that are Future Proofed, Multimodal and have Integrated Technologies.

Focus on Living: Smart City projects are Safe, Healthy, Equitable, Culturally & Socially Vibrant and help to provide a Beautiful Public Realm.

5.3 Smart City Framework

Through benchmarking and best practice research it was determined that Smart City is a global phenomenon that is providing a new direction and framework for the digital transformation happening in cities around the world. Smart City has evolved to become a new planning lens that is informing City building with technology becoming an integral part of the public realm.

Central to the Smart City Master Plan is the creation of a new Smart City Framework that will enable informed decisions through collaboration and engagement following the City's Business Planning and Budget processes ensuring alignment with the City's overall Strategic plan. The Smart City Framework is an agile structure that will guide Smart City initiatives and allow for a wide range of activities and possibilities, while maintaining a strong forward motion.

5.3.1 Future Ready

We are a new city. Mississauga is only 40 years old. We are a young city. Our citizens are 39 years old on average. We are a diverse city with over 200 languages spoken. We are a city of immigrants at 53%. We are a city of entrepreneurs and business owners which is 1/4 of the local labour force. We are a city preparing for our future.

The world is always changing with new technologies, new ways of doing things, changes in social and cultural activities. Being resilient - the ability to connect, adapt and succeed - will ensure that individuals, communities, our city and our country can thrive in the future. Being Future Ready is about being prepared in order to lead, to support and to prepare for a bright future for Mississauga.

Trend and Foresight Research
The Smart Cities team will help prepare the organization by leading, co-leading or managing trend and foresight research practices. This will enable the city to be resilient in an ever changing world. Examples include: Mississauga Foresight Research Project; Smart Digital Screens, Electric Vehicles and the Urban Realm, trends in digital customer service.

Human Centred Design
Using a human centred approach the Smart Cities team will lead and support the organization across departments to use a variety of contemporary design techniques to create cross departmental, multi-disciplinary approaches to problem solving, idea generation and collaboration. Examples include: Workshops, design thinking, prototyping, and user testing.

Pilot Projects
Pilot projects are a great starting point to help solve problems, bring together stakeholders, try new technologies, test new systems and processes, build capacity, build connections, and engage the community. The Smart Cities team will lead and support pilot projects that will help support citywide goals and strategies by testing ideas on a small scale to determine viability. Examples include: Artificial Intelligence, Blockchain, Environmental Sensors, Smart Street Furniture, Augmented Reality, Digital Divide, Smart Parking, etc.

5.3.2 Connected

The city is where the people are. It is where we go to the park, take our kids to school, have dinner, run our businesses, ride our bikes, shop. Smart City technologies create an interconnected web allowing for city wide support for a variety of services that can help our day to day lives easier.

Wireless Mississauga
Wireless Mississauga is the City's free public use Wi-Fi network with over 55 hotspots across the city.

Internet of Things (IoT) Network
A wireless network at over 700+ locations across the city which will enable projects such as automated traffic systems, air quality sensors, noise detection, etc.

Public Sector Network (PSN)
This network of fibre optic cables is North America's largest publicly owned communications network. It provides communication services such as internet and phone services to municipal and hospital buildings across the region.

Mississauga Digital Services
Mississauga currently has over 150 digital public services to serve the public.

5.3.3 Open

Mississauga will be a community that empowers citizens and strengthens the relationship between residents and public organizations by providing trustworthy, accessible, inclusive, usable and barrier-free data, processes and participation.

Open government, sometimes called Gov2.0, is based on the idea that government processes should be open and transparent. In recent years this has grown to include a wide range of other activities including a rise in community engagement activities, civic tech groups and projects, and, in general, an increased sense that technology can be a useful tool in developing a more open dialogue between governments and citizens.

Public Engagement
The Smart Cities team will provide ongoing opportunities for engagement with the public. Examples include: Centre for Civic Curiosity, online engagement, etc.

Civic Technology
The city will utilize a variety of civic tools and processes to ensure strong governance for smart cities projects, as well as opportunities for providing open and transparent information and processes. Examples include: Data Principles and Policy, Open Data, etc.

Programs and Activities
Public programs and activities will ensure continued information sharing, educational opportunities and other means to connect. Examples include: Tech and the City, Digital Literacy Program, workshops, activations, etc.

5.3.4 Collaborative

Mississauga will be a city that harnesses the power of innovation through collaboration. Through the collective knowledge of community and business partners; local, national and international governments and agencies; local residents; and across internal departments we will use shared knowledge to create a strong and resilient city.

Smart Cities serves as a kind of ‘connective tissue’ that will bring together complex ideas, technologies and stakeholders. This collaborative model will enable knowledge sharing, creation of efficiencies and innovative Partnerships - The Smart Cities team will work with a variety of internal and external stakeholders to develop projects, activities, programs and services. Examples include: Government, Industry, Post-Secondary, Community, etc.

Cross Disciplinary
Smart Cities will provide opportunities to break down internal silos and work together in new ways. Examples include: Processes, Policies, Strategies, Work Plans, etc.

Innovation Challenges
To encourage innovation, and to co-problem solve with our community, Smart Cities will launch a series of Innovation Challenges. These will be open to the public and provide opportunities for low cost solutions to a range of local issues.

Programs and Activities
Smart Cities will provide collaborative tools and activities to bring together diverse stakeholders. Examples include: Smart Cities Workshops + Education, etc. ideas.

5.3.5 Every Day

We often think of 'innovation' as dramatic and splashy. Often the most useful innovations can be embedded so deeply into our everyday that we almost forget about them. These are the technologies that are integrated into our daily lives such as citizen service tools like parking and garbage reminder apps, or traffic cameras at our intersections. Often these types of projects can make a strong impression but quickly become typical tools that become expected and part of everyday use.

Everyday technologies are also embedded into the city's current systems. These systems continue to provide a high level of service on an ongoing basis

Process, Reporting
The Smart Cities team will ensure that projects are monitored, with efficient processes, and clear reporting. This will help to ensure ongoing quality as well as to ensure everyday projects are kept up to date with the ever changing technological and social ecosystem. Examples include: Process Development, Project & Partner Intake, Ongoing Reporting, Dashboards, etc.

Measurement and Benchmarking

Smart City measurement and Benchmarking will be achieved through ISO 37122 Smart City certification enabling a credible and global form of measurement and benchmarking for the City.

Smart Cities Lens
The Smart City Lens will be used to ensure projects are adhering to Smart City framework and indicators.

Internal Integration
Smart Cities will be integrated into the systems and processes throughout the city. It will provide opportunities to leverage current systems and processes in order to continue to provide efficient, timely, and cost effective services. We will continue to build on these processes. Examples include: Lifecycle and Business Plan Processes, Policies, Strategies, Work Plans, Ongoing Activities, etc.

5.3.6 Data Centric

Data is the raw material of Smart City technologies. Data can be measured, collected and reported, and analyzed, whereupon it can be visualized using graphs, images or other analysis tools.

With the rise of IoT and AI, data driven decision making and a myriad of other smart cities technologies, the sheer amount of data is mind boggling. These large amounts of data - structured and unstructured - are often referred to as Big Data.

Data provides opportunities and challenges. It requires specialized knowledge, tools and resources. It also can be analyzed for insights that lead to better decisions and strategic business moves

Current Snapshot
While the city currently uses a data driven model for decision making, the scale and complexity of contemporary data, along with an increase in inputs from new technologies such as IoT devices and Artificial Intelligence (AI) and Machine Learning (ML) systems, it is important to get a snapshot of where the city is now, and recommendations for planning for the future. Examples include: Current Snapshot and Data Foresight Project

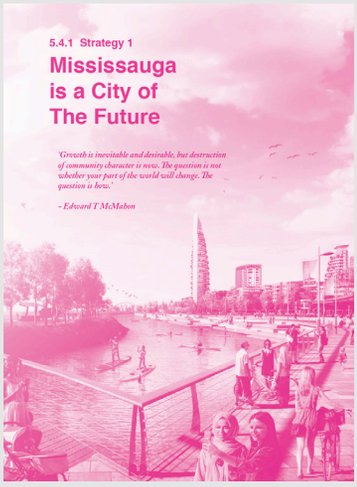
Internal Processes
We continually look for ways to improve our internal data systems and have ongoing projects looking at continuous improvement in this area. Examples include: Data and Analytics Strategy, Continuous Improvement Plans with a focus on LEAN methodology, Enhancement of Data Driven Decision Making Processes, GIS

Public Data
Continuing to expand on our suite of publicly available data and data portals across the city, data education and engagement activities. Examples include: Open Data, Tech and the City, Planning Information Hub

5.4 Smart City Strategies & Actions

How will we achieve our goals?

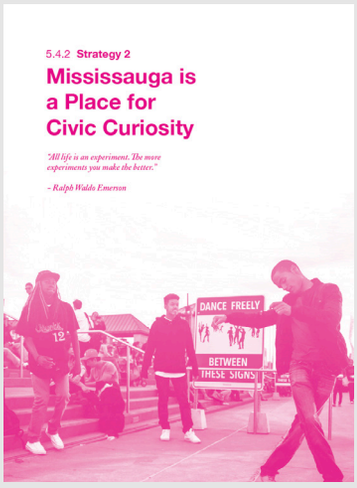
Our goals are ambitious but achievable. There are three Actions that will help guide and implement Smart City Projects.



1

Mississauga is a City of the Future

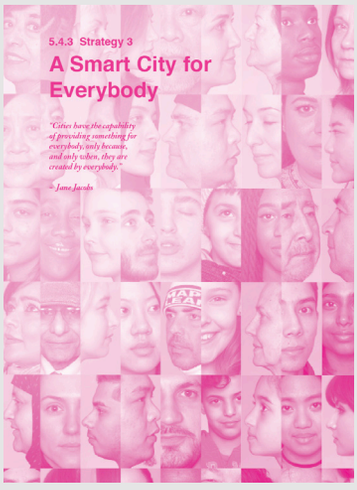
This Strategy will help direct the future of large scale projects across the city.



2

Mississauga is a Place for Civic Curiosity

This Strategy will provide engagement opportunities for people and business as we build a Smart City together.



3

Mississauga is A Smart City for Everybody

This Strategy will ensure that the city we are building is inclusive and helps support all Mississaugans.

5.4.1 Strategy 1

Mississauga is a City of The Future

'Growth is inevitable and desirable, but destruction of community character is now. The question is not whether your part of the world will change. The question is how.'

– Edward T McMahon

Mississauga is already a Smart City.

Mississauga has had an opportunity to build technology into our infrastructure, systems and processes in tandem with the rise of digital technology in our society. Mississauga is, in many ways, already a 'smart city'. This digital ecosystem ensures that all of Mississauga's neighbourhoods are supported through digital infrastructure, systems and processes. This includes a substantial digital foundation, that is often unseen, including North America's largest Public Service Network of communications fibre, city-wide wifi, an LED lighting grid which saves energy, an Internet of Things (IoT) grid that can help with everything from traffic management to air quality control.

Smart City will use technology to help create a city that is ready for the challenges of today, and prepared for a city of the future.

Smart City is City Building

We increasingly live in cities. Recent studies have found that 54% of the world's population currently lives in cities. In 2050, city dwellers will make up 66% of the world's population.[1] With 92% of Ontarians using the internet everyday, the expectations of businesses being online, the rise of digitally enabled transportation, and the continued rise of digital infrastructure within cities, for a wide variety of uses including data collection and support for marginalized communities, government led Smart City initiatives are inherently about supporting and building neighbourhoods.

Within this context, it is important to ground the Smart City Master Plan within a socio-cultural context as well as within the city's Operational Plan, a strategic document that outlines the overall plan for Mississauga. This contextual viewpoint includes looking at connecting the past, present and future; our changing demographics; economic opportunities and the changing nature of work; mobility and freedom of movement in the city; urban development and growth; and, of course, technology.

We believe that Smart City can sustain, foster and lead initiatives that will support a high quality of life for all Mississaugans and is integral to planning for cities of the future.

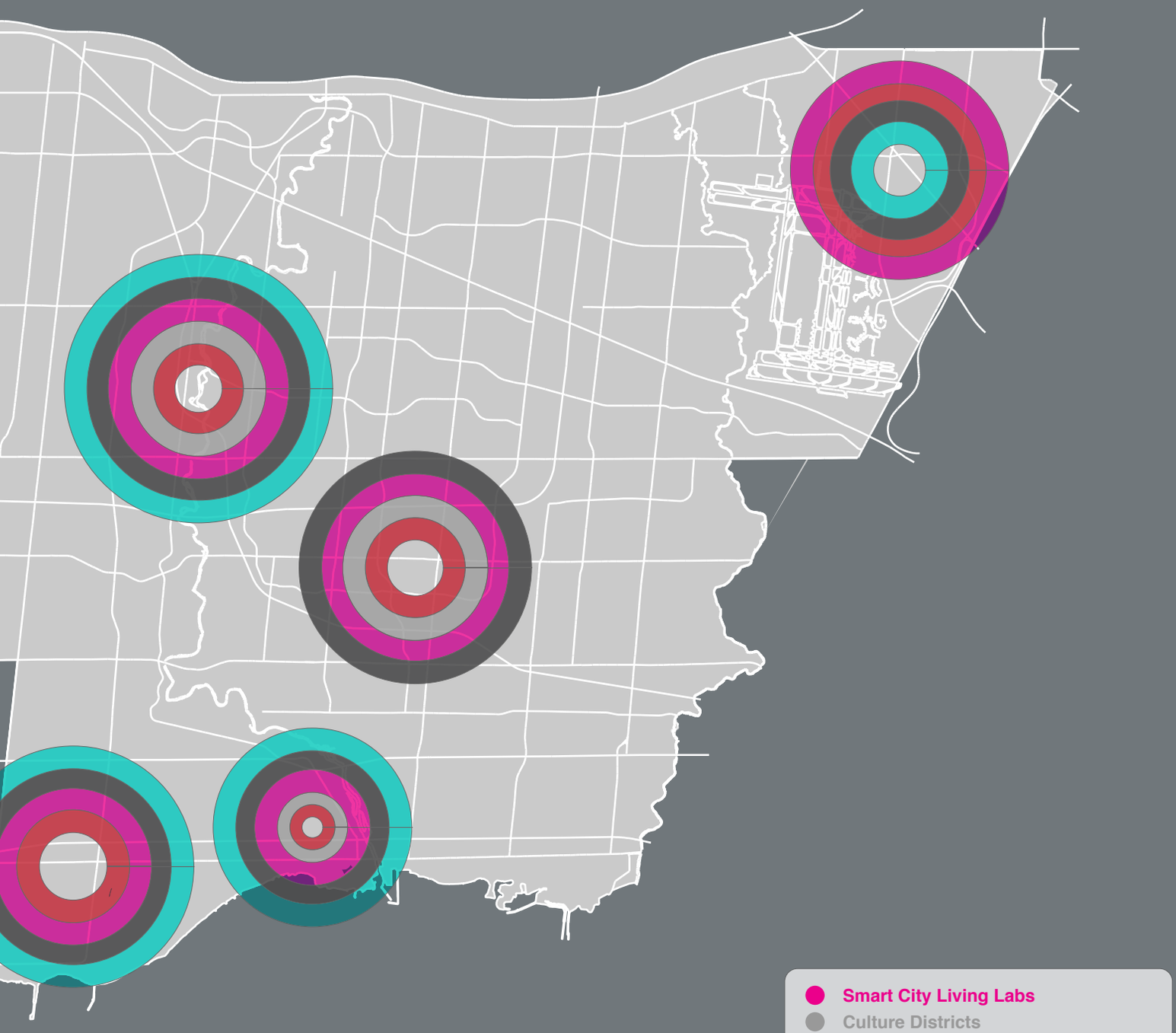
1 https://www.un.org/en/development/desa/news/population/world-urbanization-prospects-2014.html

Smart City Integration

Smart City initiatives have been designed to support, integrate and collaborate with the future planning process in connection with departments across the city. Smart City aligns with city-wide and neighbourhood plans.

At a city-wide level this includes Mississauga's Official Plan , a land use plan led by the Planning and Building Department and the City's Strategic Plan, which received feedback from 100,000 Mississauga residents on their vision for the future.

At a neighbourhood level, Smart City will help to build vital and connected communities along with Culture, Tourism, Transportation including Cycling and other Active Transportation activities, Planning & Building and the Business Improvement Areas (BIA), who are looking at creating safe, active, creative and sustainable communities throughout the city.



Smart City Technology & Trends

Smart City technologies are emerging at a rapid pace such as autonomous vehicles, 5G networks, Internet of Things (IoT) and drones. As these technologies develop, Smart City will play a role in helping to prepare the city, including its infrastructure and facilities, for these, and other, emerging technologies.

Future City Features

Trends & Foresight	Interoperable & Scalable	Data Privacy & Cyber-Security	Mobility
Nodes, Clusters, Neighbourhoods	Public Realm	City Science	Digital Infrastructure
Efficient	Safety & Security	Big Data	Data Science

*see Key Terms for definitions

Highlighted Actions

5G: 5G technologies are in the process of being deployed across the globe. This digital cellular network is intended to enhance coverage and speed. For example, 5G can support up to a million devices per square kilometer, while 4G supports only up to 100,000 devices per square kilometer. Along with increased mobile phone service, it will also play a role in autonomous vehicles, industrial automation and public safety. Smart City will help prepare the city for this extensive network throughout the city.

Mississauga Library System: As one of the city's largest public facing services, Mississauga's Library System is a key partner for Smart City. The Mississauga Library have long been an access point for the community to access the Internet, computers, workshops and a variety of online services from Lynda.com to downloadable e-books and streaming films.

With their 2019 Future Directions Master Plan the Mississauga Library System made a commitment to further expanding their digital footprint. They describe their direction as: 'The collections, facilities, programs, technology and people in public libraries are in the process of a remarkable metamorphosis. This transformation is continuing, and the public library consequently continues to move ever further into a position of informational, technological, social, cultural and educational leadership.'

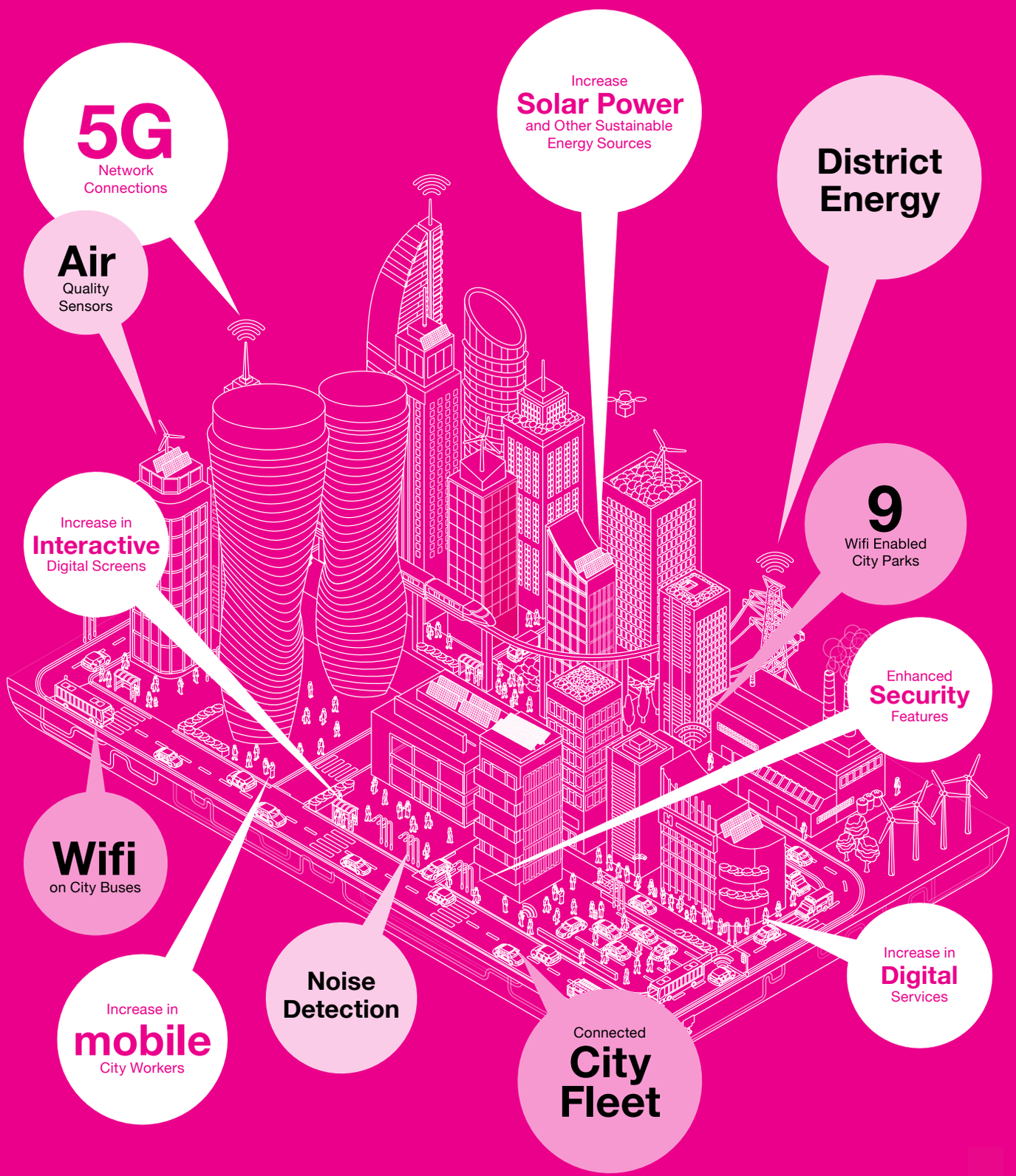
As part of this new direction Smart City initiatives have been encouraged with the public RFP process in developing new digital opportunities across the Library System and the Central Library redevelopment project.

Advanced Traffic Management System (ATMS): Traffic is an issue in most urban centres. Mississauga's transportation team is leading a project to implement ATMS at key locations in the city to help improve the flow of traffic, improve safety, reduce fuel consumption and environmental cost, increase economic productivity and enhance mobility.

Connected Fleet (Telematics): Telematics connects data and communications in vehicles. For municipalities it is useful to track and manage the city's fleet of vehicles. It can help to track everything from fuel consumption and idling trends, to route management, and accident detection. The city's transportation department will be implementing telematics technologies into their fleet.

As we continue to grow our SMRT CTY what does that look like in the future?

Here is what we expect in the future..



5.4.2 **Strategy 2**

Mississauga is a Place for Civic Curiosity

"All life is an experiment. The more experiments you make the better."

- Ralph Waldo Emerson

Overview

A Smart City is one that harnesses the collective intelligence of the city and its people. Through projects such as the Living Labs, Innovation Challenges and the Centre for Civic Curiosity we will work with the public to discuss, design and create innovative solutions to real world issues facing our communities.

We envision a city where opportunities for innovation are readily available; where problems are solved through collective ingenuity; where we data driven decisions are matched with the lived experience of our community members; where the public, industry, institutions and government can work together to build on our strengths and dream of a better future.

Key Topics

Open Engagement	Open Data	Community Partnerships
Nodes, Clusters, Neighbourhoods	Funding & Procurement	Global Partnerships

*see Key Terms for definitions

5.4.2.1 Living Labs

Cities and neighbourhoods grow and evolve over time, as do broader factors such as technology, the environment, the economy. Smart City technologies are intended to meet the needs of each neighbourhood and the people that live and work there. Living Labs are common in Smart Cities throughout the world. In these spaces the city is able to test new technologies on a trial basis in a real-life context with a user-centred approach. Locals are able to get information and provide direct feedback about the project as they progress. If the technologies prove to be useful they can then be expanded to other regions of the city, if required.

Mississauga is planning for 5 Living Labs:

Highlighted Actions

Downtown Data Project (DDP) - A collaboration between Smart City and Planning & Building. As a part of the Downtown Living Lab, this initiative will use public data to help shape the direction of Mississauga's downtown. This project will also be used to engage the public and provide opportunities for the public to understand the ways that the city uses public realm data to make decisions and inform strategy.

Accessibility Pilot - Led by the Accessibility team in partnership with Accessibility Committee, Facilities Management, Celebration Square and supported by Smart City. This project will ensure wheelchair users have a place to charge their chairs.

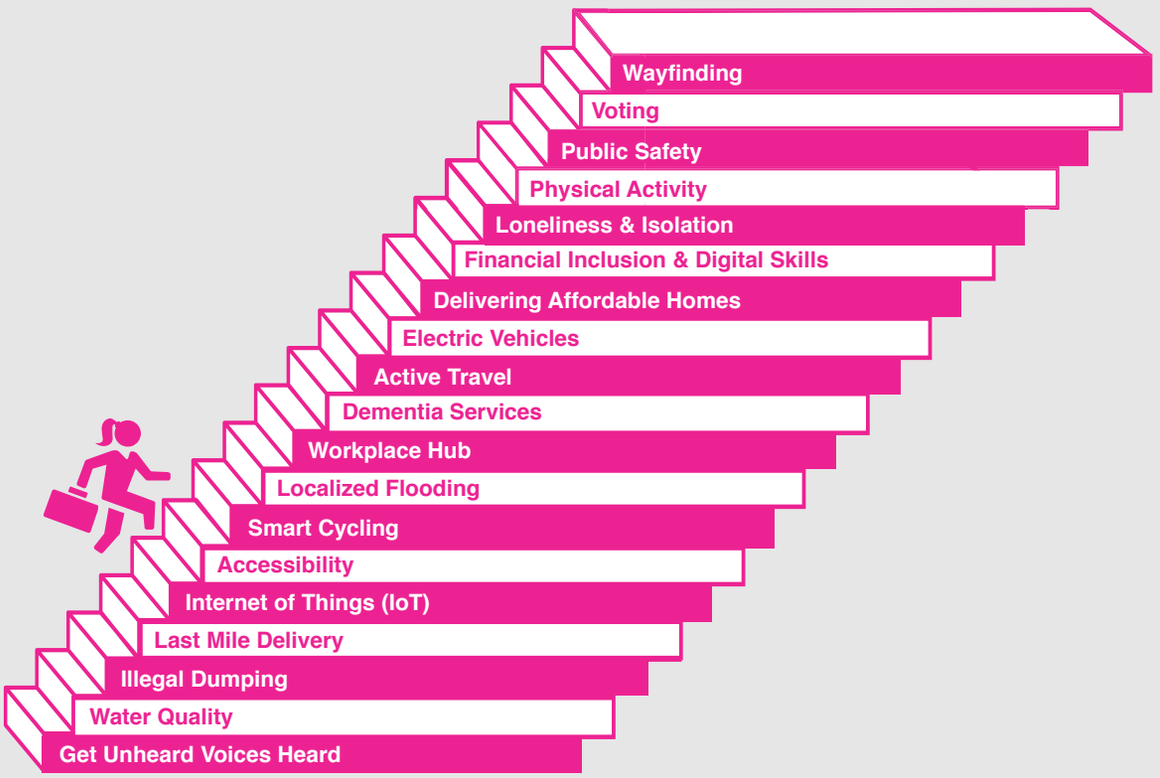
Augmented Reality - A geolocative AR project that will engage the public and showcase public art. Led by a local start up, this project involves collaboration between Culture, Tourism and Smart City.

Digital Screens - Interactive digital screens including self serve kiosks and roadside signs, are already part of the city's inventory. New screens will be installed in select locations that will test out new features such as accessibility enhancements, public engagement, security cameras, and emergency announcements.

5.4.2.2 Innovation Challenges

Many smart municipalities provide opportunities to solve local problems and invite innovation through public challenges. With a small amount of money offered as a prize, issues such as localized flooding, developing new uses for an underused park, or other neighbourhood improvements can be opened to the public to encourage engagement and develop innovative solutions.

Possible Innovation Challenges



With our partners at Mississauga Economic Development Office, we will be developing a model for innovation challenges that will both help to solve local issues but also provide opportunities for local entrepreneurs to test outnew ideas and connect with the city.

5.4.2.3 Centre for Civic Curiosity

Digital technology - including Smart City technologies - affect our lives in ways we could not have imagined. Our societies, governments and cultures are all influenced by these shifts. The Centre for Civic Curiosity is a roving engagement hub where the public can come and explore, learn, connect and contribute to the future of their city. It is a space to explore new ideas and grow our understanding of Smart Cities together. This centre will be a cross disciplinary space, led by Smart City, and open to internal and external groups that have an interest in ideas that will shape our city.

Highlighted Actions

Event Series - A series of events will be held to examine topics relevant to smart cities. These events include talks, panels, workshops and demonstrations.

Creative Engagement Activities - These activities are intended to further conversations around smart city topics and engage the public.

Pop Up Initiatives - These pop ups will provide opportunities for the public to interact with Smart City. They will be in various locations throughout the city.

Possible Topics
Accessibility
The Future of Smart Cities
Aging in a Smart City
Future Mobility
Emerging Technologies
Public Wi-Fi
Electric Vehicles
Future of Work
Climate Change
Digital Inclusion
Citizen Centred Data
Drones and Other Driverless Vehicles
Smart Infrastructure
Solar Power
Bike & Car Sharing
Bridging the Digital Divide
Smart Waste Management
A Healthy Smart City

Possible Activities
Launch New Projects
Design Thinking Activities
Artist in Residence
Innovation Challenges
Public Engagement Activities
Hackathons
Experiential Learning
Creative Projects
Pop Up Maker Spaces
Book Readings
Civic Tech Events
Training
Community Events
Walking Tours
Workshops
Talks

5.4.3 Strategy 3

A Smart City for Everybody

"Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody."

– Jane Jacobs

Overview

A Smart City for Everybody is one that utilizes technology to reach, support and engage all Mississaugans regardless of age, ability, and socio-economic status. An inclusive city is one where a high quality of life is achieved for all.

We envision a city that is inclusive, where residents feel empowered and connected to their communities, and each other; a place where people feel safe and enjoy vibrant communities; a city that tackles the digital divide between those who have access to technology and those who do not; a city where people feel welcomed; a city with a strong economy with opportunities for everyone.

Smart City will use technology to support a high quality of life for all people, in all circumstances across the city.

Who is it for?

When we say 'everybody' what do we mean by that? As a municipal government we will utilize Smart City technologies to help support Mississaugan's from a variety of backgrounds, ages, abilities, incomes, languages, education and skills. This includes city wide initiatives such as free wifi, to specific programming targeted towards particular needs. The below scenarios have been developed to help personify the ways that Smart City can help support our community.

Key Topics

Inclusive & Empowered by Design	Human Centred	Digital Inclusion	Collaborative Governance
Contemporary & Citizen Focused	Free Publicly Accessible Wifi	Thinking Digital	Digital Transformation

***see Key Terms for definitions**

5.4.3.1 Citizen Centred Smart City Policy

What is governance and why is it important?

Delivering a citizen centred approach to data policy is a primary concern for Mississauga's Smart City. According to the McKinsey Centre for Government:

"When governments deliver services based on the needs of the people they serve, they can increase public satisfaction and reduce costs." This policy will address these needs, along with an increased awareness of data privacy and security.

The creation of the Smart City Policy will include the co-creation of Smart City Principles with the public to ensure a perspective where the interests and opinions of citizens are instrumental in defining expectations and setting priorities. This set of Smart City Principles will become the backbone of the Smart City Policy that will guide Smart City decisions.

Highlighted Actions

Digital Literacy Events and Activities - These will to help raise awareness and knowledge about Smart City technologies and their implications on society.

Smart City Principles Workshop - This will be a co-creation event where the public can help build the core principles for the Smart City Policy.

***link to full list of Smart City Initiatives in the appendix**

5.4.3.2 Digital Inclusion

What does digital inclusion mean?

Digital Inclusion refers to the activities necessary to ensure that all individuals and communities, including the most disadvantaged, have access to, opportunity to use, knowledge, and skill with digital technologies and are therefore able to participate in, and benefit from, today's growing knowledge and information society.

Connected to digital inclusion are the digital divide, the uneven distribution in access to, impact of technology within a community; digital literacy, an ability to use, understand and create with technology; accessibility, the ability to access a system, or a city, for people with disabilities; universal design the design of buildings, products or environments to make them accessible to all people, regardless of age, disability or other factors; and access, the broad dissemination of digital tools, processes and infrastructure across a city, available to all members of the public. The City of Mississauga has many initiatives that help to provide support for all Mississaugans, as well as people that work and visit here.

Highlighted Actions

Wireless Mississauga Wireless Mississauga is the City's free public use Wi-Fi network. Free Wi-Fi is currently accessible at over 70 locations across Mississauga and the system continues to expand. This includes:

iParks - Nine City of Mississauga parks will be built with Wi-Fi. This connectivity will also allow for digital screens, an expansion of the Internet of Things (IoT)network, smart furniture and other digital infrastructure and services.

Living Lab Neighbourhoods - Port Credit and Downtown Mississauga will haveexpanded service areas, with the other BIAs in consideration for further expansion of free Wi-Fi.

Centre for Civic Curiosity – Smart City's Centre for Civic Curiosity will provide opportunities for awareness, education and sharing of information around smart city initiatives globally in order to create a broader digital literacy across the city.

Mississauga Library System - Libraries will address digital literacy through a variety of programs such as Maker Spaces, access to emerging technologies and activities with partners such as Smart City.

Digital Main Street - Led by the City of Mississauga's Economic Development team, the Digital Main Street is a program and service that helps small businesses achieve digital transformation by providing support to help them adopt digital tools and technologies towards the development and growth of local main street small businesses.

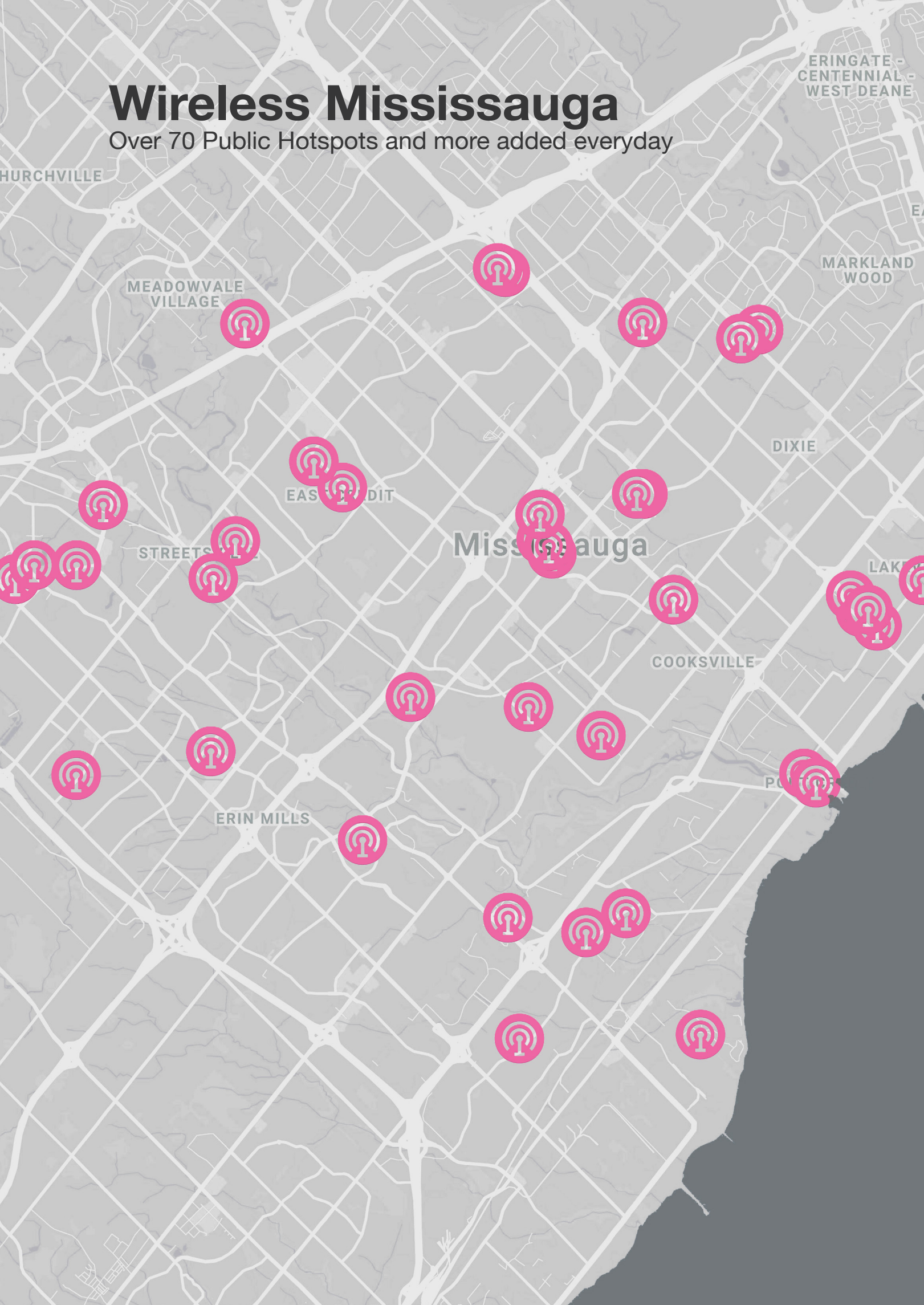
Laptop and Hotspot Lending Program (LHLP) - Not all Mississaugans have the same access to laptops and data hotspots. Through the Library System, in partnership with Smart City and United Way of Peel Region, the City of Mississauga will expand their current technology lending program to help bridge the gap for those that may need digital tools to find work, do homework and increase their digital literacy.

Eduroam - Eduroam allows students, researchers and staff from participating institutions to obtain Internet connectivity across campus and when visiting other participating institutions by simply using their mobile device. It is a secure, world-wide roaming access service developed for the international research and education community. eduroam is available in more than 70 countries and 17,000 locations worldwide.

*link to full list of Smart City Initiatives in the appendix

Wireless Mississauga

Over 70 Public Hotspots and more added everyday



5.4.3.3 Civic Technology

In contemporary cities, the public expects a high quality of digital service. Civic technology, or civic tech for short, is technology that enables engagement, participation or enhances the relationship between the people and government by enhancing citizen communications and public decision, improving government delivery of service, and infrastructure. The City of Mississauga currently has over 150 digital services, which we continue to refine and grow.

Highlighted Actions

Digital Services - The City of Mississauga's Better Connected Strategy (2018) sets out a vision of creating people-centred digital services that are fast, clear, and easy to use for people of all abilities. The outcome of this strategy is a new process that has been developing and updating digital services across the organization. This agile process will see the roll out of revamped services such as the city's website and other online tools. This process has included extensive and ongoing input from the public and other key stakeholders.

Open Data - Mississauga's Open Data is public information that can be freely used by anyone and is available for public research, analysis, reporting and mobile app development. Open Data has over 100 varieties of datasets such as census results, city public Wi-Fi locations, licensed eateries, and more.

Customer Service Artificial Intelligence (AI) Pilot - The City of Mississauga's 311 Customer Service will be enhanced through an AI chatbot. This will enable our team to provide 24 hour service and also free up our customer service agents to deal with more complex issues as they arise. This pilot will enable our customer service team to test out whether AI is the right solution and for our customers to help us test out this emerging technology.

Have Your Say Mississauga! - Have Your Say Mississauga! In an online engagement hub that hosts the City of Mississauga's current public engagement activities. It is the place to share your ideas and opinions on the projects that are transforming Mississauga including projects about city planning, transportation, recreation, culture, parks, and more.

*link to full list of Smart City Initiatives in the appendix

SMRTCTY

is for entrepreneurs like Agata.

As a mom and an entrepreneur, Agata spends a lot of time driving her children around to soccer, swimming and dance classes. Agata always needs to be on top of her business. She loves that she can always find a place to plug in, power up and connect as she watches her kids in their various activities through the cities iParks. She also appreciates the ability to find so many government services online so she can access them when she has available time, including the Unlimited Mississauga digital tools that help her connect to other entrepreneurs, find new clients and learn related skill

6.
Implementation

SMRTCTY

6.1 Smart City Master Plan Implementation

The Smart City Master Plan provides a 10 year outlook and will be directed by the following:

- The Smart City Goals will be the basis for measurement tools for Smart City initiatives
- The Smart City Framework will guide the direction and set the basis for Smart City processes
- The Smart City Master Plan aligns with strategic processes across the organization that will work in tandem with Smart City projects
- A series of actions and processes are outlined in the Appendix of this document. The Information Technology service, home to the Smart City team, will both lead on projects and provide an advisory and educational role throughout the organization
- This master plan is intended to be a living, agile document that is intended to keep in line with changes in technology, public and social expectations.

Digital Transformation

Understanding the difference between Information Technology (IT) and Smart City is essential for understanding this Smart City Master Plan. In a municipal context, IT has traditionally been a support for internal staff, along with a few forward facing projects such as websites and online services. Smart City shifts digital into the public realm including infrastructure, transit, street furniture, public facing services and programs. This is a fundamental change and is the driving force behind the Smart City movement. Mississauga has created a tool called the Smart City Lens to help focus digital projects and manage keys issues such as:

- A greater need to engage with the public when introducing technology into the public realm maintaining public trust and government accountability.
- greater focus on data and privacy as sensors collect unprecedented amounts of data and governments struggle with terms of use and transparency.
- The proliferation of technology, sensors, cables and components in the built environment putting pressure on the city right-of-way and negative impacts of street beautification.
- More opportunity for public private partnerships for innovation and demonstration of technology capabilities in a municipal setting.
- Expectations of digital in the public realm is higher as cities around the world vie for leader status in Smart City and ultimately shape the markets and industry that the cities engage to plan, design and deliver services.

6.2 Financing the Smart City Master Plan

Financing the Smart City Master Plan will require a mix of new and existing models; new conversations with the public and key stakeholders. Smart Cities provides opportunities to leverage new ways of simultaneously developing new products and services, while looking for innovative funding models. The popularity of Smart Cities also provides opportunities for Public Private Partnerships, institutional and community partnerships, external funding, as well as in kind and sponsorship.

Business Planning and Budget Process - Smart City projects will be incorporated into current Business Planning and Budget process. This process is a standard across the city and is overseen by Council.

Lifecycle - Lifecycle will be one of the main sources for resourcing Smart Cities projects. As items reach their lifecycle the Smart City team will help advise on new trends and connect departments with similar needs.

Innovation Challenge Fund - Innovation Challenges will also require a small innovation fund to ensure that adequate resources are available to contribute to the co-creation or innovation of the challenge. Innovation Challenges and pilot projects will be public procurements at a small scale and will create an opportunity for partnerships. These innovation challenges will help to de-risk technology projects by providing opportunities to prototype projects prior to implementing medium and large scale projects.

Collaboration and Shared Investments - Many industries and institutions are looking to work in the Smart Cities space, which provides opportunities for collaboration and shared investments.

Capital Funding - Many Smart Cities projects can be funded through the city's normal investment lifecycle. As old systems are replaced Smart Cities solutions can be implemented as part of modernization.

External Funding - With the popularity of Smart Cities, many external funding opportunities continue to be available. These reach across a variety of areas including environmental, urban planning and infrastructure projects.

In Kind and Sponsorship - Mississauga's digital infrastructure provides key opportunities for stakeholders to provide In Kind or Sponsorship for Smart Cities services, tools and systems. These will provide opportunities for stakeholders to have real world implementation for their products and services.

6.3 Resourcing the Smart City Master Plan

Implementation of the Smart City Master Plan will require dedicated staff. This staff will develop the Smart City program and manage the complex Smart City projects and relationships required for a Smart City. The required resource will be identified through the Business Plan and Budget process.

Innovation Challenges will also require a small innovation fund to ensure that adequate resources are available to contribute to the co-creation or innovation of the challenge. Innovation Challenges and pilot projects will be public procurements at a small scale.

6.4 Measuring the Smart City

Smart City projects will be measured and tracked through a variety of tools including:

- Achievements and Technology sections of the Annual Business Plan and Budget
- Annual Smart City Master Plan progress reports
- Global, national and regional benchmarking
- Against the goals of the Smart City

6.5 Smart City Lens

How do we determine what is a Smart City project? The Smart City Lens is a tool we developed to help understand what is meant by 'Smart City' in Mississauga. This tool is not intended as a 'checklist' but rather as a way of approaching projects that includes both strategic and technology angles in order to reframe them to be more connected, efficient, useful and citizen centric.

This Smart City Lens will provide the following set of questions for staff to ask as they are developing projects in order to guide their process:

Strategic Questions

- Is it Citizen Centric? Have you included user testing, or other tools for including the public?
- Have you considered the Data? Do you have a data plan including Open Data, analytics, collection, privacy, etc.?
- Are there opportunities for collaboration? Can it connect to other city projects?
- What are the trends or foresight in that field?
- Have you done your research? (design thinking, pilots, prototyping, workshops)
- Does this provide LEAN opportunities?
- Is it Accessible and Inclusive?

Technology Questions

- Is it Interoperable? Will it work with other systems and technologies?
- Is it Scalable?
- Is it Network connected?
- Is it Data enabled?
- Have you considered Data Privacy and Security?

7.
Next Steps / Conclusion

SMRTCTY

7.1 Next Steps

The Smart City Master Plan provides a framework and strategic direction for the next 10 years. Upon the endorsement of Council the following key actions will take place:

- The Smart City Master Plan will be published digitally on the Smart City website and be accessible to all. Alternative formats for accessibility can be provided upon request.
- The Smart City Steering Committee will develop new terms of reference to provide guidance and oversight for the Smart City Framework operationalizing the concept of Smart City Continuous Improvement.
- The Smart City Project Team will commence planning of the Centre for Civic Curiosity which will provide a public forum in the Living Labs to collaborate and define principles for data privacy informing the creation of a Smart City Policy.
- The first Smart City Innovation Challenge will be developed and advertised as a small scale initiative to test and fine tune the process with the intent to engage our key agency partners, industry and local educational institutions.
- The Information Technology 2020 Business Plan and Budget will define the required resources to sustain the implementation of the Smart City Master Plan and an assessment of all Service Area Business Plans for Smart City opportunities will be complied for the Smart City Steering Committee for planning purposes.

The Smart City Framework provides structure and guidance which informs the City of Mississauga on emerging technologies, decision support for lifecycle replacement initiatives and exploring opportunities to partner on co-innovation initiatives.

The Smart City Master Plan is the responsibility of the Director if Information Technology and Chief Information Officer for the City of Mississauga.

7.2 Conclusion

Mississauga's Smart City Master Plan lays out an ambitious plan that will help guide Mississauga into the future. Collaboration with the public, partner organizations and other city departments is essential to ensuring that we are getting it right. Our approach is a mix of policy, infrastructure, programming, community engagement and technology intended to meet the diverse needs of a large urban centre.

We are excited to plan for the future of Mississauga as we develop a Smart City for Everybody.

8.
Appendix

SMRTCTY

8.1 Public Engagement

Mississaugans feel passionate about the future of their city. The Smart City public engagement process acknowledges the importance of incorporating local knowledge and community values in the planning of smart city initiatives.

Phases of Engagement

Phase 1: Mississauga took part in Infrastructure Canada's Smart City Challenge in 2018. Through this process empowerment and inclusion, economic opportunity and mobility emerged as the three biggest challenges facing Mississauga. After further engagement and discussions, the key challenge facing Mississauga was identified as social resilience.

Phase 2: Building on this input, the Smart City team embarked on a two month public engagement in 2019., The environment, accessibility and innovation emerged as key discussion points. Inclusion and ensuring that Mississauga keeps up with global trends were also identified during this process.

What You Said

(a selection of your great ideas, questions and comments)

People

- Privacy - prime consideration in ALL projects
- Consider how citizen innovation from city open data can happen and contribute to smart city mission
- Host Open Data forums for how the city uses, secures, manages data to help remove concerns with data privacy
- Explore creating a co-op/non profit to expand and connect the city's PSN to businesses, NGO, even homes at cost!
- How to distribute the value if data assets to the data owners. i.e. each one of us. Might be a difficult question that is worth good public debating
- Accessibility is key

Economy.

- Innovation hubs and councils that help bring research including pilots tied to economic development
- BIA engagement - re-envision business in the future
- Community engagement + connection to local educational institutions and local businesses
- Scaling opportunities to other communities (local, regional, provincial, etc)
- Provide local, sustainable economic opportunities for all members of the community and retain local talent
- City needs to change procurement policies to use technology from companies in Mississauga instead of buying from big companies!

Environment

- I wish there was IoT concerned with waste management. Most things that go to be recycled end up in the landfill.
- Historical trend analysis is powerful. My hope is that when conducting analysis, we keep in mind and prioritize environmental protection / impact from 'consumer' trend analysis
- Explore District Energy
- Make Mississauga more eco friendly! :) eg solar panels, businesses, school
- Electric vehicle / Autonomous Vehicle infrastructure
- Tackle light / air / noise/ water / soil pollution
- CLIMATE CHANGE!

Living

- Prototype use cases of the citizen reflected within city divisions
- Food security
- Digital interactive art and light based public art
- Multiculturalism. Information and data offered in multiple languages
- Create more awareness around activities happening around the City of Mississauga
- Provide better access to housing, health, transit, food, recreation, employment, services and information for Mississauga's vulnerable populations.
- Volunteer tutor hubs in public libraries. Volunteer bank hours and trade them for tuition and training..

Mobility

- Reduce congestion and commute time and generally improve the ease of getting around Mississauga.
- Prioritize and promote active transportation and less dependence on cars.
- BRT and cycle tracks on all major linear streets by 2030 (cheap, quick, simple, smart stations) and track metrics
- Heated bus stops by using the solar energy system
- Pedestrian / Cycling - sensors, smart infrastructure at intersections
- Transit hubs - solar shelters, phone chargers, wayfinding maps, emergency / 311 phone

By The Numbers (Numbers include Phase 1 + Phase 2)

- 30 public engagement events
- 1,265 residents engaged in person
- 3 industry engagement events with 100 participants
- 18 SMRT CTY pop ups with 270 participants
- 7 public engagement sessions with 165 participants
- 386,089 social media impressions and engagements
- 817, 824 exposures through traditional media
- Engagement with 550 people at over 50 organizations, institutions and businesses
- 7,600 visits, 1,843 direct engagements and 605 submissions on the 'Have Your Say' Engagement platform

***Organizations, institutions and businesses engaged include*:** University of Toronto Mississauga (UTM), Sheridan College, Region of Peel, BIAs, Mississauga Board of Trade, Mississauga Food Banks, The Salvation Army, Human Service Agencies, Ecosource, Peel Environmental Youth Alliance, Mississauga Youth Action Committee, Community Living Mississauga, Mississauga Sports Council, SELF, ONX, Microsoft, CISCO, United Way Greater Toronto, Glenforest STEM, Dixie Bloor Board District, TRCA , Living Arts Centre, Partners in Project Green, Community Foundation of Mississauga and Mississauga Smart Commute, Rotary Club, Environmental Action Committee, (Mississauga) Accessibility Advisory Committee, Hackernest, PC Hacks and Seniors Fair, and others.

How Was This Information Incorporated Into the Smart City Master Plan?

- Majority of feedback supported the direction of the Smart City Master Plan.
- Gaps or areas that were not clearly articulated were taken into consideration and staff worked to clarify or add into the final plan.
- Ideas and suggestions for Smart City projects will be kept and considered for future initiatives.
- Comments that are relevant with other city divisions were shared with appropriate teams.

Communications

- A thorough communications strategy supported the Smart City engagement. Tactics included:
- Social Media (Facebook, Twitter, LinkedIn)
- Posters
- Website
- Mobile Signs
- Media: public service announcements; media releases, printer and online advertising
- City of Mississauga Community Calendar
- Digital Billboards and Screens in civic facilities incl. Libraries and Community Centres
- Direct Email (internal / external stakeholders)
- Partner Email Lists & Newsletters
- TV Newscast
- City's eNewsletter
- City Councillors ward newsletters

Participants' Age

**based on survey responses at engagement events

19% 18-14 years
23% 25-34 years
26% 35-44 years
16% 45-54 years
13% 55-64 years
3% 65-74 years

How You Participated

Open Data Day/ Launch Event This event, co-hosted by MindShare Workspace in Erin Mills Town Centre, was the launch of the SMRT CTY public engagement. Participants had the opportunity to hear speakers, view community partner showcases and give their feedback on the Smart City initiative.

Industry Engagement Sessions Industry partners were invited to provide their input and hear more about Smart City initiatives. These sessions were held in both phases of Public Engagement.

Public Engagement Sessions- A series of open house engagement sessions enabled the public to share their thoughts about various Smart City initiatives.

Smart City Pop Ups- Smart City pop ups were deployed at all 18 of Mississauga Libraries. This ensured a wide range of voices from a variety of economic and social backgrounds, ages and physical abilities.

Playces + SMRT CTY Art Exhibit- OCADU Digital Futures students created art installations examining the idea of Mississauga as a Smart City. The students installed, presented and gave tours of their artworks. The public was also invited to provide feedback into the Smart City initiative.

Artworks

Reflexion Erika Masui Davis, Mustafa Abdel Fattah
Zenith Johan Seaton, Bomi Doh, Mohammed Obaid Quraishi, Ardy Llantino, Sarah Parent, Thomas Graham
SYNTHiSAUGA Jerez Bain, Harit Lad, Sanmeet Chahil, William Selviz Rivas
Lost Treasure of Mississauga Vivian Fu, Pandy Ma, Sydney Pallister, Julianne Quiday, Ziyi Wang
Critter Sauga Vivian Wong, Anran Zhou, Mika Hirata, Natalie Le Huenen, Nan Yao, Tetyana Pavlivna Samokhvalova

Professors- Cindy Poremba, Immony Mèn, Alex Leitch

Have Your Say! Online Engagement Platform - The public was invited to contribute ideas through our online engagement platform during both phases of engagement. This allowed for engagement from those who preferred to respond online or were not able to attend in person.

Employee Engagement Session - Staff from across the Corporation were invited to provide input into Smart City initiatives.

How can you continue to engage With Smart City?

Smart City will have a variety of ways to engage with Smart City projects. The opportunities will arise mainly through the Innovation Challenges, Centre for Civic Curiosity and the Living Labs, although other opportunities will arise as needed. Information about how to engage can be found on the Smart City website. **smartcity.mississauga.ca**

8.2 Strategic Connections

Plans and Policies from across the organization have been tested against Smart City Goals and Framework.

Project	Smart City Goals						Framework					
	People	Government	Environment	Economy	Mobility	Living	Future Ready	Open	Collaborative	Everyday	Datacentric	Connected
CITYWIDE												
Strategic Plan - Our Future Mississauga	X	X	X	X	X	X	X	X	X	X	X	X
CITY MANAGER'S OFFICE												
Economic Development Strategy	X			X	X	X	X		X			X
Life Sciences Cluster Strategy	X			X		X	X	X	X	X	X	X
CORPORATE SERVICES DEPARTMENT												
IT Master Plan	X	X		X		X	X	X	X	X	X	X
Information Technology 2018- 2020 Business Plan & 2018 Budget							X	X		X	X	X
Open Data Roadmap (on approval)	X	X	X	X	X	X	X	X	X	X	X	X
Geospacial Master Plan		X					X	X	X	X	X	X
Customer Service Strategy	X	X				X	X					
Better Connected Strategy	X	X				X	X	X	X	X	X	X
Multi-Year Accessibility Plan / 2016 Annual Report of the Multi-Year Accessibility Plan	X	X	X	X	X	X	X	X	X	X	X	X
TRANSPORTATION & WORKS DEPARTMENT												
Transportation Master Plan			X	X	X	X	X		X	X		X
Mississauga Cycling Master Plan			X	X	X	X	X		X	X		
MiWay Five Transit Service Plan (2016-2020)	X		X	X	X	X	X			X	X	
Parking Master Plan (Pending Approval)	X	X	X	X	X	X	X	X	X	X	X	X

Project	Smart City Goals						Framework					
	People	Government	Environment	Economy	Mobility	Living	Future Ready	Open	Collaborative	Everyday	Datacentric	Connected
COMMUNITY SERVICES DEPARTMENT												
Future Directions - Library	X					X	X	X	X	X		X
Future Directions - Culture	X			X		X	X		X	X		X
Future Directions - Parks & Forestry	X		X			X	X		X	X		X
Future Directions - Fire & Emergency Services	X					X	X		X	X	X	X
Future Directions - Recreation	X				X	X	X		X	X		
Climate Change Action Plan (On Approval)	X		X	X	X	X	X	X	X	X	X	X
5 Year Energy Conservation Plan 2019-2023	X		X		X		X	X	X		X	
Credit River Parks Strategy	X		X		X	X	X		X		X	X
Mississauga Youth Plan	X	X			X	X	X		X			
Older Adult Plan	X	X			X	X	X		X	X		
PLANNING & BUILDING												
Mississauga Official Plan			X	X	X	X	X				X	
Downtown 21 Master Plan	X		X	X	X	X	X		X	X		
Inspiration Lakeview	X		X	X	X	X			X	X		

8.3 Global Best Practices

For Smart City Master Plans (condensed version)

Researched and Compiled by:

h

OVERVIEW

This summary of global best practices was conducted to help inform the development of the City of Mississauga's Smart City Master Plan. Best practices were identified through three initiatives:

Literature Review

The literature review included academic articles, along with reports from stakeholder organizations, such as Evergreen, Future Cities Catapult, the European Commission, IBI Group and the US Conference of Mayors. Each discussed success factors and lessons learned for smart city master planning and often included related examples.

Smart City Master Plan Scan

Smart City Master Plans to review were selected based on references from the literature, recommendations from the City of Mississauga and a high-level scan of municipalities in Canada that have developed a Plan or similar document. Internationally, some of the first Plans were developed around 2011, whereas, within Canada, City of Vancouver's Digital Strategy was one of the first Plans of its type, published in 2013

Interviews with Experts

CUI conducted interviews with select smart city experts, specifically identified by City of Mississauga or leveraged through CUI's network. They include:

- Professor Enrico Motta, Director of MK:Smart, The Open University;
- Brian Matthews, Head of Transport Innovation, Milton Keynes;
- Alanna Coombes, Place and Future City Officer, City of London;
- Emily Middleton, Harvard Kennedy School (based on her work in updating the Greater London Authority's new Smart London Plan); and
- Chaun Wang, Director General, Yinchuan Municipal Bureau of Big Data Management and Service (via email correspondence).

KEY LESSONS LEARNED

From CUI's research, the following overarching lessons learned emerged:

- The success of smart city initiatives largely depends on having a robust strategy grounded on a clear **vision** for the future of the city. The vision should build on existing priorities and assets to align with local needs and goals.
- Strong **leadership** from municipal leaders and executives is required to develop a comprehensive and sustainable plan.
- The development of a Smart City Master Plan should be **community-led** not technology-led, so

technology is used to solve real problems and not look for problems.

- Inclusionary access to community-wide **data** is key. Most Smart City Master Plans will include the development of an open data platform if one does not already exist.
  - Making data reporting mandatory for certain services (e.g. transit) can be one method for overcoming the challenge of accessing data owned by private companies.
- Form a network of **partnerships** between public sector agencies, the private sector and academia.
- **Engage** local communities in all aspects of the plan, from initial strategy to data collection, design and deployment.
- **Reach out** to the community voices that are not typically heard and listen, to ensure inclusionary engagement.
- Cities should plan to **embed** smart city strategies into community master plans and strategies.
- To generate buy-in from **citizens**, smart city solutions should provide an option that is better than existing conditions – for example, develop a mobility service that is better than free parking.
- Require solutions to be **interoperable** and built with commercially available technology to ensure systems are future-proofed and scalable

OBJECTIVES/DRIVERS

In many cases, adoption of smart city solutions has been in response to the digital revolution we are currently experiencing. However, this is letting technology lead smart cities without ensuring first there is a true community problem to solve. The driver of a Smart City Master Plan is to implement a proactive approach to harness the digital transformation for improved quality of life and economic growth. A Master Plan positions a municipality to take advantage of opportunities, while identifying pitfalls to avoid

Based on Catapult's Smart City Strategies - A Global Review, the ambitions of a smart city strategy can be summarized in three categories: Economic, Social or Environmental, as described:

- Economic ambitions: "…use technology to improve services and create efficiencies, while attracting investment and boosting economic development."
- Social ambitions: "…encourage inclusivity, transparency, trust and empowerment of citizens."
- Environmental ambitions: "…seek to achieve environmental sustainability."

With increased urbanization and population growth, many cities have focussed on economic ambitions to leverage digital solutions to support this growth and encourage a prosperous economy. However, Catapult found that ambitions of smart city strategies have evolved over the years, moving to a stronger focus on social and environmental improvements.

Drivers for smart city solutions will vary for each community and depend on the local and national context, as well as the ambitions. Citizens themselves are arising as a main driver with city authorities under growing pressure to deliver efficient and convenient services in line with what they expect as digital customers..

Barcelona, ESP: Barcelona was a pioneer of smart city master planning and IoT solutions. The City's first Smart City Strategy in 2011 was a top- down approach involving major urban infrastructure projects in street lighting, transportation, energy and water. But not all projects were successful. By continuously reviewing and revising its plan, Barcelona is now approaching its strategy with a citizen-centric focus – looking at what technology can do for the people, with a new plan: Digital Transformation Plan. This plan has three high-level objectives:

- Identify technologies to transform Government & the City;
- Foster the City's digital innovation ecosystem to support companies and the social sector; and
- Empower citizens.

Bristol, UK: The main driver for Bristol's smart city and innovation strategy is to provide citizen-centric solutions for a growing population. The strategy has two main initiatives: Bristol is Open and **Bristol's Smart Operations Centre**. Bristol is Open is focussed on building an open programmable city to give

citizens more ways to participate in and contribute to how their city works. “Being open means we proactively share what we learn with other cities, technology companies, universities and citizens.” The Smart Operations Centre integrates some of the city’s critical support services for staff to work together with an advanced communication platform.

Columbus, USA: The driver of the Smart City Application is to address four primary issues: an aging population; a growing younger population that is moving to the dense urban areas; mobility challenges in select neighborhoods; and a growing economy and population with related housing and commercial, and passenger and freight, and environmental issues, using existing data and networks, along with smart technologies with partners and stakeholders.

Edmonton, CA: The Smart City Strategy is about creating and nurturing a resilient, livable and workable city through the use of technology, data and social innovation.

Kitchener, CA: Council approved Digital Kitchener in January 2017. The overall objective focuses on collaboration and economic ambitions:

- “Together with our partners, we will build a foundation that harnesses the power of digital technology to create a world-class smart city.”

London, UK: The objective of Smart London is to strengthen its appeal as a place to invest by maintaining it as the largest tech market in Europe, improving the city’s functionality and ensuring its citizens and businesses are engaged in world-leading ideas.

Milton Keynes, UK: The MK:Smart program was initiated in response to being one of the fastest growing cities and economies in the UK. The objective is to support sustainable growth without exceeding infrastructure capacity, while meeting key carbon reduction targets and making it one of the top economic cities in the UK.

New York City, USA: In 2011, New York launched one of North Americas first Smart City’s strategy Roadmap for the Digital City, updated in 2013 and now embedded within the City’s overall plan One New York: The Plan for a Strong and Just City (2015-ongoing). OneNYC was developed with the objective to “…make our city stronger, our people better prepared for jobs in the 21st century economy, our government more responsive, and our communities able to withstand the existential threat posed by climate change.”. OneNYC also lays out specific targets or challenge statements:

- New York’s city greenhouse gas emissions will be 80 percent lower by 2050 than in 2005.
- New York city will send zero waste to landfills by 2030.
- New York City will have the best air quality among all large U.S. cities by 2030.
- New York City will clean up contaminated land to address disproportionately high exposures in low-income communities and convert land to safe and beneficial use.
- New York City will mitigate neighborhood flooding and offer high-quality water services.
- All New Yorkers will benefit from useful, accessible, and beautiful open spaces.

St. Albert, CA: Published in October 2016, St. Albert developed its Smart City Master Plan to align with its current context and the demands of its technological and knowledge-based society. The objective of the Master Plan is to produce three overall outcomes:

- Greater efficiency: Identify and support opportunities for improved operational efficiencies, employee productivity and returns on investments;
- Dynamic economic development: support economic development efforts to grow existing business and attract new investment; and
- Enhanced service delivery: identify innovations or technologies to improve asset management, sustainability and enhanced municipal service delivery.

Yinchuan, CHN: The Smart Yinchuan initiative was driven to solve four problems China has been facing in the process of urban development: traffic congestion; environmental pollution; urban safety; and alienation. Yinchuan is also intended to be the blueprint for smart city implementation in cities across

China, with three main objectives: enhance city management with information technology; benefit, favour and serve the public; and promote industrial development.

ENGAGEMENT

In the development of most plans reviewed, either in the first iteration or ongoing updates, public engagement has been key to ensuring the proposed smart city addresses true citizen needs and that the plan is community-led, not technology-led. The Plans acknowledge public engagement should be inclusive of all community groups, with far-reaching and diverse initiatives to connect with residents and leverage the opportunity to fill skill and knowledge gaps. Engagement is also about connecting and collaborating with all stakeholders. Success of a smart city master plan will come from "… combining public governance, people ownership and business collaboration, driving communication between these groups by giving each of them a true stake in the smart city built out of their community." Much of this collaboration will be fostered through productive partnerships, as outlined in the next section.

Below are examples of smart city initiatives that have either been clearly directed by extensive engagement or have limited engagement during the development process for a specified reason. Some examples also highlight the value of continued citizen engagement for the effectiveness and sustainability of smart city plans.

Barcelona, ESP: With the change in government in 2015, came a review of Barcelona's past smart city initiatives. It was found that solutions had been implemented with little analysis of the true impact on the community. From this, Barcelona has redefined its digital strategy to be citizen driven, based on extensive public engagement by providing tools for citizens to provide their feedback. The city is also focusses on ensuring solutions serve the many, not just the few.

Columbus, USA: In the Smart City Application, Columbus identify continued, collaborative and authentic community engagement as a risk mitigation strategy for implementing smart city initiatives. Ongoing engagement builds awareness that can help generate buy-in and mitigate future public complaints.

Edmonton, CA: The City led the development of the Smart City Strategy while understanding it requires collaboration between citizens, industry, academia and government to address the current challenges and provide opportunities for the future. Open Engagement is defined as part of the Strategy for citizens to impact the design, development and delivery of community programs, services and policies.

London, UK: The first edition of Smart London had a strong focus on digitally engaging citizens to help identify the city's biggest challenges and potential solutions through its online research community, Talk London; its open database, London Datastore; and multiple hackathons. For the new Smart London Plan currently being developed, the city is undertaking a Listening Exercise. This plan-update is starting with a call to businesses, public servants, academia, civil society and practitioners for solutions to the challenges of growth.

Masdar City, UAE: The development of the city is very technology driven so there was minimal public engagement, as well because Masdar is a new city, there were few existing residents.

Milton Keynes, UK: Three continuous outreach initiatives to engage: businesses, citizens and local schools. This includes skills and knowledge training for industry and students. MK:Data Hub CityLabs is a program for SMEs to partner with MK:Smart to receive support and resources for prototyping and implementing data-centric applications and services. Urban Data School is an initiative to bring smart city data literacy to primary and secondary schools – providing environmental and urban data sets and data skills. CitizenLab involves citizens in the innovation process, not just through an outreach program, enabling them to directly contribute to decision-making.

New York, USA: A variety of engagement methods were used to gain input from the community for OneNYC. An online public survey had 7,500 responses and 1,300 residents were engaged in person through 40 community meetings. Fifty elected officials also met with 177 civic organizations.

St. Albert, CA: Input for the Smart City Master Plan was collected through St. Albert's broadest stakeholder engagement effort to date. Opportunity for continuous public engagement is also identified as a medium priority smart city strategy to be implemented as part of the plan.

Yinchuan, CHN: The smart city approach is top-down; the city is organizing the technology first and

then will move citizens in. Yinchuan focused on industry engagement and securing major private partners to contribute to funding. This approach was used to develop a smart city framework that could be replicated throughout China (i.e. less dependent on existing community).

PARTNERSHIPS

For many of the municipalities reviewed, it was important to establish a concrete, mutually-beneficial partnership with businesses, academia and other levels of government to strengthen and sustain their smart city initiatives. Partnering with large tech companies is valuable not only for fostering innovation but also can be an important source of funding. In many smart cities, academic institutions are involved in developing smart city solutions and programs, and can also be an integral part of bridging the knowledge gap. Partnering with other levels of government ensures the vision and direction of a smart city is aligned with regional governance and generates buy-in from key stakeholders.

A best practice in forging industry partnerships is to ensure the solutions provided are technology agnostic and interoperable with other service providers. This can be accomplished by outlining this as a requirement in the Smart City Master Plan or through the procurement process. There are also interoperability standards that can be used, for example, TALQ.

Select examples of smart city partnerships are listed below.

London, UK: In both the first version of the Smart London strategy and the updates currently being developed, London has leveraged partnerships with private partners, public organizations, national and international universities, charities, the European Union and across wards within the city.

- London Borough Partnership: increasing data sharing between boroughs.
- European Commission's European Innovation Partnership: contributing to the development of data platforms for European cities.
- UK Power Networks: city data partner to source Low Carbon London data.
- Private sector: Intel Laboratories, SciencScope, City Insights, Santander.
- Charities: The Royal Parks, Guide Dogs, GO-ON, Do-it.
- Universities: Imperial college, MIT, University College London, Aarhus University.
- EU Horizon 2020 partnerships, including with: demonstrator boroughs, Transport for London (TfL), Imperial College, KiwiPower, UrbanDNA, Concirrus, Mastodon C, Siemens UK and Future Cities Catapult.

Bristol, UK: Bristol is Open is a joint venture between the City of Bristol and University of Bristol. The program is also welcoming a range of partners to the project, including large telecom and software companies, small hi-tech start-ups, public service delivery organisations, academics and others. It is funded by the local, national and European governments, with academic research funding, and by the private sector. Industrial partners use the program's city-scale Research and Development digital network to explore how programmable networks can be used to address a variety of challenges in the city of the future - these include: NEC, InterDigital and Nokia.

Edmonton, CA: The overall objective of Edmonton's Smart City Strategy is to create a smart city ecosystem built on four equal partners of government, industry, citizens and academic. Lead by the government, citizens drive the desired outcomes, industry appears to be engaged on a solution-base case and academic partners are involved throughout to promote innovation, accelerate startups and harness skills and knowledge.

Columbus, USA: To implement the five strategies of Columbus' Smart City Application, the city is partnering with businesses, public entities, universities, public service providers and data and technology partners, including: the regional economic development organization (Columbus2020), a venture capital and startup studio (Rev1 Ventures), association of municipalities (MORPC), Columbus tourism, transportation authorities, Ohio State University, environmental non-profits (Clean Fuels Ohio) and IBM Analytics Data Center.

Milton Keynes, UK: MK:Smart developed a coalition of 21 partners to progress the smart city agenda, involving council, universities and industry partners, such as:

- Open University: lead partner in developing MK:Smart and lead developer of the MK Data Hub.
- SMEs: can partner through CityLabs, a program of the MK Data Hub.
- Universities: University of Cambridge, University of Bedfordshire.
- Private sector partners: HR Wallingford, BT, Fronesys, graymatter, playground energy, Catapult
- Charities: Community Action: MK,
- Utilities: Anglian Water, e-on

St. Albert, CA: Throughout the strategies and actions outlined in St. Albert's Smart City Master Plan, the City identifies where industry partnerships will be cultivated but does not explicitly name who the partner will be. In the Smart City Action Plan (included in the Master Plan), St. Albert also identifies where there is an opportunity for securing a funding partner, but does not commit any organization.

Yinchuan, CHN: Among others, ZTE is the lead private partner, contributing to funding and developing Smart Yinchuan through collecting and using big data. Yinchuan also partnered with the international TeleManagement Forum (TMF) to host the TMF Global Smart City Forum in Yinchuan for three years.

ASSESSMENT

To understand the opportunity for smart city solutions, it is a best practice to take stock of the existing conditions and establish the baseline. For assessing the success of a smart city, there can be various levels of evaluation:

- Specific key performance indicators (KPIs) for each work stream or initiative;
- To what extent solutions are deployed at scale and adopted by the community; and
- The extent of global visibility as a smart city leader.

Key performance indicators should be defined for each desired outcome of the Smart City Master Plan, as well as the smart city strategies outlined in the action plan. KPIs are a set of values against which to measure progress. The municipality will track the KPIs to demonstrate that the Master Plan is or is not achieving its goals and meeting targets and timelines.

The Smart City Master Plan Team can develop unique KPIs specific to the Plan's action plan or can leverage standardized approaches provided by national or international standards bodies. A preliminary review of existing KPIs used by the community should be completed to identify opportunities for their application to the outlined smart city strategies.

If developing unique KPIs, the metrics should be selected to be:

- Comprehensive (covering all aspects of the outcome);
- Comparable (data can be compared between communities and over time);
- Available (historic and current quantitative data should be available or easy to collect);
- Independent (overlap of KPIs should be avoided);
- Simple (understanding and calculating the indicator should be straightforward); and
- Timely (indicators should be relevant to emerging smart city issues).

The International Organization of Standardization (ISO) and the United Nations Economic Commission for Europe (UNECE) are example bodies who provide standardized KPIs for smart cities.

The ISO currently has two potential standards for evaluating smart cities using a uniform approach to what is measured (KPI) and how it is measured:

- **ISO 37120** was developed in 2014 as the first ISO International Standard on city indicators. It outlines smart city indicators across 17 sectors that are organized as high, medium and low priorities.
- **ISO/TS 37151** is a technical standard developed in 2015 that outlines principles and requirements for performance metrics of smart community infrastructures and provides recommendations for assessment methods.

Smart London was specifically interested in the economic opportunity, so the City defined the baseline by assessing the extent of potential investment in its smart cities market, encompassing smart energy, transport and mobility, healthcare and environmental infrastructure. The plan also outlines measures of success for seven overarching ambitions, shown below.

Ambition	Measures of Success
Londoners at the Core – putting people and businesses at the center.	• Increase in number of Londoners who use digital technology to engage in policy making. • Host hackathons to solve city's growth challenges • Deliver a pan-London digital inclusion strategy • Double the number of technology apprenticeships in 2 years.

Additional links:

http://futurecities.catapult.org.uk/wp-content/uploads/2017/11/GRSCS-Final-Report.pdf

https://www.ft.com/content/6d2fe2a8-722c-11e7-93ff-99f383b09ff9

https://www.bristolisopen.com/about/

http://news.bristol.gov.uk/state_of_the_art_operations_centre_opens_in_bristo

https://www.transportation.gov/sites/dot.gov/files/docs/Columbus%20OH%20Vision%20Narrative.pdf

https://www.edmonton.ca/city_government/documents/PDF/Smart_City_Strategy.pdf

https://www.kitchener.ca/en/resourcesGeneral/Documents/FCS_IT_Digital-Kitchener-Strategy.pdf

http://www.digital21.gov.hk/sc/relatedDoc/download/2013/079%20SchneiderElectric%20(Annex).pdf

http://magazine.ouishare.net/2017/06/building-the-networked-city-from-the-ground-up-with-citizens-interview-with-francesca-bria/

http://oro.open.ac.uk/48228/1/penelope_mcsusers_Staff_spc24_SMART%20cities%20%26%20communities_Conference_Communication%20on%20Smart%20Cities%20in

https://www.iso.org/files/live/site /isoorg/files/archive/pdf/en/37120_briefing_note.pdf

https://www.iso.org/news/2015/10/Ref2001.html

8.4 Smart City Initiative List

Initiative	Action	Framework	Indicators	Lead	Partners	Estimated Timing	Resourced By
The City of the Future							
AI Customer Service (Proof of Concept)	Develop and AI that can enhance the 311 customer service and allow for expansion to 24 hour customer service.	Future Ready; Collaborative; Data Centric; Connected; Open; Everyday	People; Government; Living	SMRT CTY	311, Nuvoola, Amazon	2019	External Funding
Automated Traffic Management System (ATMS) (Proof of Concept)	To test solutions to congestion problems through the deployment of state-of-the-art sensing, communications, and data-processing technologies.	Future Ready; Collaborative; Data Centric; Connected; Open; Everyday	People; Economy; Mobility; Living	Traffic Signals and Systems	SMRT CTY	2019	New Initiative
City Fleet	To modernize the city fleet through telematics, the integrated use of telecommunications and informatics for application in vehicles and to control vehicles on the move.	Future Ready; Collaborative; Data Centric; Connected; Open; Everyday	Mobility	Fleet, T&W	SMRT CTY, IT	2019-2021	Lifecycle Replacement
Digital Screens	To modernize the next version of digital screens throughout the city.	Future Ready; Collaborative; Connected; Data Centric; Everyday; Open		SMRT CTY	MiWay, Recreation, Library, Parks, Accessibility, Communications, Digital Services; IT; Facilities & Property Management, Communications	2019-2020	Lifecycle Replacement
Organizational Digital Transformation	Staff Training & Capacity Building; Digital Literacy; Future of Work	Future Ready	Government	SMRT CTY	HR, Communications	2019 - 2023	Business As Usual
iParks	Implementation of digital infrastructure, tools and services into nine city parks.	Future Ready; Collaborative; Connected; Data Centric; Everyday; Open	Living; People	Parks	SMRT CTY, Digital Services, IT	2019-2020	New Initiative
Mississauga Library System	The inclusion of digital services and tools across the Mississauga Library System, including as part of the redevelopment of the Central Library	Future Ready; Collaborative; Connected; Data Centric; Everyday; Open	People; Living; Economy	Library	SMRT CTY	2019-2025	New Initiative
PSN Expansion (Lakeshore projects)	The extension of the Public Service Network fibre into new neighbourhoods.	Future Ready; Collaborative; Connected; Everyday	Living; Economy; People	IT; IoT	SMRT CTY; Planning & Building	2019-2021	Ongoing & New Initiatives
IoT Network Expansion	The extension of the IoT network across Mississauga	Future Ready; Collaborative; Connected; Everyday	Mobility; People; Living;	SMRT CTY	IT	Ongoing	Business as Usual
Citywide Data	A research project to determine the future data resources for the city.	Future Ready; Collaborative; Data Centric; Connected	Government	SMRT CTY	All City Partners, External Partners	Ongoing	Business as Usual
MiWay Bus Wifi	A pilot projects adding Wi-Fi to city buses.	Future Ready; Collaborative; Connected; Data Centric; Everyday; Open	Mobility; People; Living	MiWay	SMRT CTY	2020	Business as Usual
Smart City ISO Standard	Developing and ISO Standard for Smart City to enable global benchmarking.	Future Ready; Collaborative; Connected; Data Centric; Everyday; Open	Government	SMRT CTY	PMSO	2019	Business as Usual

Initiative	Action	Framework	Indicators	Lead	Partners	Estimated Timing	Resourced By
A Place for Civic Curiosity: LIVING LABS							
Launch of Living Labs	The launch of Living Labs across Mississauga focussed in the following neighbourhoods: Downtown, Malton, Port Credit, Streetsville, Clarkson, Lakeview Neighbourhood.	Future Ready; Collaborative; Connected; Data Centric; Everyday; Open	People; Government; Environment; Mobility; Economy; Living	SMRT CTY	Planning & Building; Culture, Parks, Forestry & Environment; BIAs	2019	Business as Usual
Living Labs Online Portals	Online portals for the Living Labs to provide information to the public about the various Smart City activities.	Future Ready; Collaborative; Connected; Data Centric; Everyday; Open	People; Government;	SMRT CTY	GIS	2019	Business as Usual
Design and implement citizen facing information in neighbourhoods	Clear and fun signage that will help inform and engage the public.	Collaborative; Open	People; Government; Living	SMRT CTY	Creative, Branding	2019	
Smart Parking (Proof of Concept)	A parking pilot to help test parking usage.	Future Ready; Collaborative; Connected; Data Centric; Everyday; Open	Mobility; Economy; Living	Parking	SMRT CTY	TBC	
Customer Service Kiosk (Proof of Concept)	A customer centred kiosk system that will eliminate lineups.	Future Ready; Collaborative; Connected; Data Centric; Everyday; Open	People; Government;	SMRT CTY	Clerks, Customer Service, Front Desk,	2019	
Digital Screens (Proof of Concept)	Interactive digital screens that will provide a wide range of content, services and wayfinding.	Future Ready; Collaborative; Connected; Data Centric; Everyday; Open	People; Government; Living	F&PM	SMRT CTY, IT	2019	
Accessibility (Proof of Concept)	Wheelchair Charging Stations, Voice Over 311, etc	Future Ready; Collaborative; Connected; Data Centric; Everyday; Open	People; Government; Mobility; Living	SMRT CTY, F&PM	Accessibility Committee	2019	
Downtown Data Project	A collaborative project with Planning & Building to help support the new Downtown Strategy.	Future Ready; Collaborative; Connected; Data Centric; Everyday; Open	People; Government; Environment; Mobility; Economy; Living	SMRT CTY, P&B Downtown Strategy		2019-2020	
Art on the Screens	An annual series that brings art to the digital billboards in Celebration Square.	Future Ready; Collaborative; Connected;	People; Living	Culture		Ongoing	
Augmented Reality	A project bringing together emerging technology with contemporary art.	Future Ready; Collaborative; Connected;	People; Living ; Economy	SMRT CTY; Culture	Tourism	2019-2020	Grant
A Place for Civic Curiosity: INNOVATION CHALLENGES							
Design and launch program	Work with internal and external stakeholders to design and launch program.	Future Ready; Collaborative; Connected; Data Centric; Everyday; Open	People; Government; Environment; Mobility; Economy; Living	SMRT CTY	EDO	2019-2020	n/a
Online Portal	Work with internal GIS, Creative and Digital Services teams to create a user friendly portal.	Future Ready; Collaborative; Connected; Data Centric; Everyday; Open	People; Government;	SMRT CTY	GIS, Creative, Digital Services, IT	2019-2020	n/a
Innovation Fund	Develop criteria and knowledge around this fund.	Future Ready; Collaborative Data Centric;	People; Government; Economy;	SMRT CTY	IT, Procurement, Legal, Risk	2019-2020	IT

Initiative	Action	Framework	Indicators	Lead	Partners	Estimated Timing	Resourced By
A Place for Civic Curiosity: CENTRE FOR CIVIC CURIOSITY							
Launch the Centre for Civic Curiosity	Develop and launch the Centre for Civic Curiosity	Future Ready; Collaborative; Connected; Data Centric; Everyday; Open	People; Government; Environment; Mobility; Economy; Living	SMRT CTY		2019	
Launch 2019-2020 events series	Develop and organize a series of events and activities,	Future Ready; Collaborative; Connected; Open	People; Government; Environment; Mobility; Economy; Living	SMRT CTY		2019	IT
Online Portal	Work with internal, Creative and IT teams to create a user friendly portal.	Future Ready; Collaborative; Connected; Data Centric; Everyday; Open	;Government;	SMRT CTY	Creative, IT	2019	n/a
Creative Community Engagement Series	A series of creative engagement activities.	Future Ready; Collaborative; Connected; Open	People; Government; Environment; Mobility; Economy; Living	SMRT CTY	Various.	Ongoing	
A SMART CITY FOR EVERYBODY							
WIreless Mississauga	Downtown, Port Credit, MiWay Transit Hubs, iParks	Future Ready; Collaborative; Connected; Data Centric; Everyday; Open	People; Government; Environment; Mobility; Economy; Living	IT		Ongoing	
Laptop / Wifi Lending Expansion	Expanding the Library's current technology lending program to reach those in need.	Collaborative; Connected; Data Centric; Everyday	People; Government; Living	SMRT CTY / Library		2019	
Digital Inclusion Projects	Working with local partners to develop programs and projects to support our community.	Collaborative; Connected; Data Centric; Everyday; Open	People; Government; Living	SMRT CTY	United Way, Newcomers of Peel, Library	Ongoing	
Digital Literacy Project	Working with our Library system on a series of digital literacy programs for the public.	Future Ready; Collaborative; Everyday; Open	People; Government; Environment; Mobility; Economy; Living	SMRT CTY	Library	2019-2020	
Smart City Policy	The development of a Smart City Policy that will help to guide SMRT CTY projects. The principles it is based on will be co-created with the public.	Future Ready; Collaborative; Connected; Data Centric; Everyday; Open	People; Government;	SMRT CTY	The Public; Legal, IT ,Clerks	2019-2020	
Digital Main Street	A program and service that helps small businesses achieve digital transformation by providing support to help them adopt digital tools' and technologies.	Future Ready; Collaborative; Open	Government; Economy; Living	EDO		2019	Grant Funding

8.5 Key Terms

Having a shared language is a key component in having shared conversations. Government and technology are both known for industry specific terms, as well as many acronyms. This list of key terms is intended as both a guide to the Smart City Master Plan and also as an ongoing tool to create understanding between a variety of partners and communities in order to have an ongoing conversation about technology and its role within our cities.

Autonomous Vehicles --An autonomous vehicle, also known as a robot car, a self-driving car, or driverless car, is a vehicle that is capable of sensing its environment and moving with little or no human input. Autonomous cars combine a variety of sensors to perceive their surroundings, such as radar, Lidar, sonar, GPS, odometry and inertial measurement units. Advanced control systems interpret sensory information to identify appropriate navigation paths, as well as obstacles and relevant signage.

Electric Vehicles (EV) --The electric car (also known as electric vehicle or EV) uses energy stored in its rechargeable batteries, which are recharged by common household electricity.

5G --The fifth generation of cellular mobile communications. 5G performance targets high data rate, reduced latency, energy saving, cost reduction, higher system capacity, and massive device connectivity. It also requires a high number of devices to be placed in the public realm.

Accessible --The ability for everyone, regardless of disability or special needs, to access, use and benefit from everything within their environment. Founded on the principles of Universal Design, the goal of accessibility is to create an inclusive society for people with physical, mobility, visual, auditory or cognitive disabilities. This means everyone has equal access to perceive, understand, engage, navigate and interact with all elements of the physical and digital world.

Analytics --The field of data analysis. Analytics often involves studying past historical data to research potential trends, to analyze the effects of certain decisions or events, or to evaluate the performance of a given tool or scenario. The goal of analytics is to improve the business by gaining knowledge which can be used to make improvements or changes.

Accessibility for Ontarians with Disabilities Act (AODA) --Ontario law that aims to identify, remove, and prevent barriers for people with disabilities. The AODA became law on June 13, 2005 and applies to all levels of government, non-profits, and private sector businesses in Ontario that have one or more employees (full-time, part-time, seasonal, or contract).

Artificial intelligence (AI) --The ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience.

Augmented reality (AR) --A type of interactive, reality-based display environment that takes the capabilities of computer generated display, sound, text and effects to enhance the user's real-world experience. Augmented reality combines real and computer-based scenes and images to deliver a unified but enhanced view of the world. Pokemon Go is an example of Augmented Reality. In a municipal context, AR is a great tool for city workers that work with underground and other 'hidden' infrastructure; as a tool for planning and building to help contextualize new developments for the public and key stakeholders; and to enhance quality of life for residents with accessibility issues.

Advanced traffic management systems (ATMS) --Seek to reduce, or at least contain, traffic congestion in urban environments by improving the efficiency of utilization of existing infrastructures. These systems typically seek solutions to congestion problems occurring on urban freeways and surface streets through the deployment of state-of-the-art sensing, communications, and data-processing technologies.

Affordable Housing --Affordable housing is an issue throughout the region and in many urban centres around the world. It affects quality of life for many residents.

Autonomous vehicles --A vehicle that can guide itself without human conduction.

BIA --A group formed of local business people and property owners who join together and, with the support of the municipality, organize, finance and carry out physical improvement and promote economic development in their district. The local municipality is the body that is responsible for approving the budget of the BIA.

Big Data --Making data driven decisions is a vital but complex process for governments. With the rise of smart city technologies more and more data is made available, but this also requires different tools, processes and appropriate resources to work with this data to solve problems, create efficiencies, and ensure we have inclusive communities.

Blockchain -- A type of data structure that enables identifying and tracking transactions digitally and sharing this information across a distributed network of computers, creating in a sense a distributed trust network. The distributed ledger technology offered by blockchain provides a transparent and secure means for tracking the ownership and transfer of assets.

Human Centred Design --Human-centered design [also Human-centred design, as used in ISO standards] is a design and management framework that develops solutions to problems by involving the human perspective in all steps of the problem-solving process.

Climate Change --Global warming is likely to reach 1.5 degrees C between 2030 and 2052 if it continues to increase at the current rate. This change will have catastrophic implications to our planet. In order to reduce this shift would require actions such as shifting to low- or zero-emission power generation, such as renewables; changing food systems, such as diet changes away from land-intensive animal products; electrifying transport and developing 'green infrastructure,' such as building green roofs, or improving energy efficiency by smart urban planning, which will change the layout of many cities.

Cloud Computing or "The Cloud" --A means of storing and accessing data and programs over the Internet instead of on a computer's hard drive.

Collaborative Governance -- A smart city is accessible, accountable, participatory and collaborative. Mississauga will succeed as a smart city through its cooperative and collaborative efforts with multiple municipal agencies and across all city departments. Information sharing across parties promotes better informed decision making to achieve collective goals that answer true community needs.

Contemporary & Citizen Focused -- Ensuring that our everyday tools are contemporary and citizen focussed so that services and information are easy to use.

Co-Working --A style of work that involves a shared workplace, often an office, and independent activity. Unlike in a typical office, those co-working are usually not employed by the same organization.

Digital Divide --A digital divide is an economic and social inequality to the access to, use of, or impact of information and communication technologies (ICT). The divide within countries (such as the digital divide in the United States) may refer to inequalities between individuals, households, businesses, or geographic areas, usually at different socioeconomic levels or other demographic categories. The divide between differing countries or regions of the world is referred to as the global digital divide, examining this technological gap between developing and developed countries on an international scale.

Digital Ecosystem --An interdependent group of enterprises, people and/or things that share standardised digital platforms for a mutually beneficial purpose, such as commercial gain, innovation or common interest.

Digital Inclusion --The ubiquity of the Internet poses challenges and opportunities for individuals and communities alike. These challenges and opportunities have not been evenly distributed. Digital technology has opened new domains of exclusion and privilege for some, leaving some populations isolated from the vast digital realm. Even equitable access, however, is no longer enough - increasingly, digital life requires that users be more than users. Users are now content creators as much as they are content consumers.

Success in the increasingly digitized social and economic realms requires a comprehensive approach to fostering inclusion. Digital inclusion brings together high-speed internet access, information technologies, and digital literacy in ways that promote success for communities and individuals trying to navigate and participate in the digital realm.

Digital Infrastructure --Foundational services that are necessary to the information technology capabilities of a nation, region, city or organization.

Digital Literacy --Digital literacy refers to an individual's ability to find, evaluate, and compose clear information through writing and other mediums on various digital platforms.

Digital Rights --The term digital rights describes the human rights that allow individuals to access, use, create, and publish digital media or to access and use computers, other electronic devices, or communications networks. The term is particularly related to the protection and realization of existing rights, such as the right to privacy or freedom of expression, in the context of new digital technologies, especially the Internet. Right to Internet access is recognized as a right by the laws of several countries.

Digital Transformation --With the fast pace of digital innovation in a rapidly urbanizing world, Mississauga is investing in data and connected technologies to future-proof its communities and ensure its residents continue to have the best opportunity for high quality of life. Inevitably, all communities will eventually become connected through the digital revolution. Mississauga is proactively planning for this transformation to maximize its impact; and understands that smart city solutions are becoming a necessity to address emerging urban challenges and seize opportunities.

E-Gov or E-Government --E-government (short for electronic government) is the use of electronic communications devices, such as computers and the Internet to provide public services to citizens and other persons in a country or region. The term consists of the digital interactions between a citizen and their government (C2G), between governments and other government agencies (G2G), between government and citizens (G2C), between government and employees (G2E), and between government and businesses/commerces (G2B).

Energy storage and distribution optimization --This includes hydroelectricity, solar energy, wind energy, wave power, geothermal energy, bioenergy, tidal power, biofuels, batteries. Energy is required for a variety of smart cities activities including electric vehicles and the future electrical grid.

Free Publicly Accessible Wifi --Providing free wifi throughout the city at all city run facilities including libraries, community centres and civic buildings; at select city parks and in district wifi regions. In Mississauga the free wifi throughout the city is called Wireless Mississauga.

Future of Work --Automation, digital platforms, AI, and other innovations are changing the fundamental nature of work. Flexible, mobile, co-working and the rise of contract jobs are creating new trends in how, when and where we work. Understanding these shifts will be essential to help policy makers, business leaders, and workers move forward.

Geographic Information System (GIS) --A system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data. The key word to this technology is Geography – this means that some portion of the data is spatial.

Human Centred --Keeping in mind that cities are for people, we will use a human centred design approach for our smart cities initiatives. This approach is a creative approach to problem solving that uses a variety of design tools to ensure that the people who live, work and play in Mississauga continue to be the focus of Smart City.

Inclusive and Empowered by Design --Bridging the Digital Divide, Digital Inclusion and Digital Justice are important factors for providing equitable and empowering opportunities for all Mississaugans through Smart City. In our technological age, the unequal access of opportunity, access, knowledge and skills in these areas can create gaps that affect both individuals and our city as a whole.

ICT --Technologies that provide access to information through telecommunications. It is similar to Information Technology (IT), but focuses primarily on communication technologies.

This includes the Internet, wireless networks, cell phones, and other communication mediums.

Income Inequality --Canada has the 12th highest income inequality of the top 17 advanced capitalist economic nations in the world. And this inequality is growing according to the Conference Board of Canada. The distribution of wealth in Canada is unequal. The top 20% of households own about 67% of the total wealth and the bottom 20% of households own less than 1%.

Internet of Things (IoT) --The network of physical devices, vehicles, home appliances and other items embedded with electronics, software, sensors, actuators, and connectivity which enables these objects to connect and exchange data. This includes projects such as smart waste disposal systems, internet enabled street furniture, light posts and traffic lights that have additional features such as solar powered batteries, environmental sensors, security cameras and a variety of other features.

Machine Learning (ML) --An application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed. Machine learning focuses on the development of computer programs that can access data and use it learn for themselves.

Master Plan --A master plan is a long term planning document that provides a conceptual layout to guide future decisions. A master plan includes analysis, recommendations, context, and context. It is based on public input, research, policies, connected plans and strategies, social and economic conditions. As a long term planning document, it is important to consider master plans as dynamic documents that can be altered based on changing conditions over time.

Mixed reality (MR) --The merging of real and virtual worlds to produce new environments and visualizations where physical and digital objects co-exist and interact in real time.

Mobile Economy --A combination of the rise of mobile workers, and the shifts this causes both socially and economically.

Mobile Workspace --A user's portable working environment that gives them access to the applications, files and services they need to do their job no matter where they are.

Mobility --Autonomous Vehicles (AV); Electric Vehicles (EV); Bike, Scooter and Car Share; connected infrastructure; smart parking, smart intersections are just a few of the innovations in mobility that are making inroads in cities across the globe. In order to prepare for these trends governments are looking at their policies, infrastructure; accessibility and demographic needs; the environment and economic forces.

Open Data --The idea that some data should be freely available to everyone to use and republish as they wish, without restrictions from copyright, patents or other mechanisms of control.

Preferred Offsite Mobile Work Location --A Hub or workspace that has been approved by businesses as an official location for their staff to work from.

Rise of Smart Cities --Smart cities affect everyone, whether directly or indirectly. People who live in smart cities or who are visiting smart cities have the immediate benefit of being connected to the governing body for information and services. Across the globe, smart city technology spending reached $80 billion in 2016, and is expected to grow to $135 billion by 2021.

Robotics and Automation. --These technologies continue to drive major shifts in economies and workforces around the world. The effects are felt socially, economically and technologically. Some of the trends in this area include: Robotic Automation; Robot as Service; Collaborative Robots; Drones; Cloud Robotics; Market Segmentation; Customizable Robots; Governmental Policy and Regulation.

Sensors (Environmental, Traffic, Etc) --A device that detects and responds to some type of input from the physical environment. The specific input could be light, heat, motion, moisture, pressure, or any one of a great number of other environmental phenomena.

Social Inclusion --Social inclusion is the process of improving the terms on which individuals and groups take part in society—improving the ability, opportunity, and dignity of those disadvantaged on the basis of their identity.

Smart Street Furniture --Digitally enhanced street furniture that is active, digital, networked. It can include: wifi, charging stations, data collection, lights, cameras, screens, and a variety of other digital capabilities.

Smart Tourism --Many cities are starting to use smart cities technologies as a draw for, and enhancement to, their tourism programs. This can include holograms that greet visitors; information sharing; they can scan QR codes with their smartphones and receive answers to frequently asked questions so they can avoid waiting in line or get deals or special offers.

Tech Corridor or 'The Corridor' --A 100km corridor in Ontario stretching from Waterloo to Toronto that is the 2nd largest technology cluster in North America.

Telematics --Telematics is an interdisciplinary field that encompasses telecommunications, vehicular technologies, for instance, road transportation, road safety, electrical engineering (sensors, instrumentation, wireless communications, etc.), and computer science (multimedia, Internet, etc.). Telematics can involve any of the following: the technology of sending, receiving and storing information using telecommunication devices to control remote objects; the integrated use of telecommunications and informatics for application in vehicles and to control vehicles on the move; global navigation satellite system technology integrated with computers and mobile communications technology in automotive navigation systems; the use of such systems within road vehicles, also called vehicle telematics.

Thinking Digital --Smart city thinking requires a cultural shift in governance, with a different way of working and thinking about municipal services. Cities that keep pace with digital transformation will eventually have 'smart' embedded in all core strategies and every community service. As more and more residents become digital customers in their everyday lives, there is growing expectation that the same efficient and convenient services be provided by their local governments. Success will be achieved when there is no longer a need for a Smart City Master Plan in Mississauga.

For the success and sustainability of smart city thinking, internal divisions and departments need to work more closely to create efficiencies, solve problems creatively, and support and leverage their activities. Smart city solutions address broad social, economic, technological and environmental issues, requiring cross-sectoral collaboration within and outside the City. The City of Mississauga will ensure all departments are actively engaged in smart city thinking and fostering innovation.

Tower Renewal --Tower Renewal is the transformation of Canada's stock of mid-century apartment towers and their surrounding neighbourhoods into more complete communities,resilient housing stock and healthy places, fully integrated into their growing cities.

Transparency --Openness, accountability, and honesty define government transparency. In a free society, transparency is government's obligation to share information with citizens. It is at the heart of how citizens hold their public officials accountable.

Urbanization --By 2040, 65 percent of the world's population will be living in cities. 1.3 million people move into cities every day. This will require cities to prepare for economic, housing, climate, mobility and other quality of life factors.

Urban Agriculture --Urban agriculture, urban farming, or urban gardening is the practice of cultivating, processing and distributing food in or around urban areas. Urban agriculture can also involve animal husbandry, aquaculture, agroforestry, urban beekeeping, and horticulture.

Voice First --Devices that employ voice as the primary input method point the way towards a more integrated and useful holistic user experience. It is generally considered to be part of an array of inclusive and accessible devices.

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