City of Mississauga
Agenda

MISSISSAUGA

General Committee

Date
2019/06/26

Time
9:00 AM

Location
Civic Centre, Council Chamber,
300 City Centre Drive, Mississauga, Ontario, L5B 3C1

Members

Mayor Bonnie Crombie	
Councillor Stephen Dasko	Ward 1
Councillor Karen Ras	Ward 2
Councillor Chris Fonseca	Ward 3
Councillor John Kovac	Ward 4
Councillor Carolyn Parrish	Ward 5
Councillor Ron Starr	Ward 6 (Chair)
Councillor Dipika Damerla	Ward 7
Councillor Matt Mahoney	Ward 8
Councillor Pat Saito	Ward 9
Councillor Sue McFadden	Ward 10
Councillor George Carlson	Ward 11

Contact
Stephanie Smith, Legislative Coordinator, Legislative Services
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Meetings of Council streamed live
and archived at Mississauga.ca/videos

GENERAL COMMITTEE INDEX - JUNE 26, 2019

1. **CALL TO ORDER**

2. **APPROVAL OF AGENDA**

3. **DECLARATION OF CONFLICT OF INTEREST**

4. **PRESENTATIONS**

4.1. Gary Kent, Commissioner, Corporate Services and CFO to present the Sustainable Procurement Leadership Council Award for Outstanding Case Study to staff on Implementing a Sustainable Procurement Policy

5. **DEPUTATIONS**

5.1. Annis Karpenko, Executive Director regarding an overview of Visual Arts Mississauga (VAM)

5.2. Item 8.1 Bonnie Brown, Director, Economic Development Office and Jeff Evenson, Director, Canadian Urban Institute

5.3. Item 8.2 Shari Lichterman, Director, Recreation

5.4. Item 8.3 Joe Perotta, Director, LRT Project Office

5.5. Item 8.4 Daniela Paraschiv, Manager, Energy Management

5.6. Item 8.5 Silvia Fraser, Manager, Security Services

5.7. Item 8.6 Shawn Slack, Director, Information Technology and Anthea Foyer, Project Leader, Smart Cities

6. **PUBLIC QUESTION PERIOD** - 15 Minute Limit (5 minutes per speaker)

Pursuant to Section 42 of the Council Procedure By-law 0139-2013, as amended: General Committee may grant permission to a member of the public to ask a question of General Committee, with the following provisions:

1. The question must pertain to a specific item on the current agenda and the speaker will state which item the question is related to.
2. A person asking a question shall limit any background explanation to two (2) statements, followed by the question.
3. The total speaking time shall be five (5) minutes maximum, per speaker.

7. **CONSENT AGENDA**

8. **MATTERS TO BE CONSIDERED**

8.1. The Mississauga Entrepreneurship and Innovation Study

8.2. Older Adult Plan for Recreation

8.3. Hurontario Light Rail Transit Project Update and Developing a Municipal HULRT Project Agreement

8.4. 5 Year Energy Conservation Plan (2019 - 2023)

8.5. Security Services Annual Report

8.6. Smart City Master Plan

8.7. Lower Driveway Boulevard Parking – Leeside Crescent (Ward 9)

8.8. Enola Avenue – Speed Limit Reduction (Ward 1)

8.9. All-way Stop - Benson Avenue and High Street West (Ward 1)

8.10. 2019 Traffic Calming Program (Wards 2, 3, 6, 10, 11)

8.11. Extension and Increase to the Contract with Tacel Ltd. for the Supply and Delivery of Traffic Signal Controllers and Related Equipment

8.12. Vacuum Leaf Collection Program Revised Criteria

8.13. Enhanced Stormwater Outreach and Education Program Update (All Wards)

8.14. SustainMobility Agreement & Funding

8.15. Mississauga Transitway Project - Execution of Maintenance Agreements - City of Mississauga and Region of Peel - Dixie Road Underpass Structure, Centreal Parkway, Tomken, Dixie, Tahoe, Etobicoke Creek, Spectrum and Orbitor Stations (Wards 3, 4 & 5)

8.16. Mississauga Matters: Summary of Priority Issues and Engagement Strategy for the 2019 Federal Election

8.17. Establishment of Ward-Specific Special Projects

8.18. Agreement with Fire Department Safety Officers Association (FDSOA) to deliver Emergency Vehicle Technician (EVT) training at the Garry W. Morden Centre

8.19. Surplus Declaration of City lands adjacent to 3130 Queen Frederica Drive (Ward 3)

8.20. Proposed Stop-up, Close, Declare Surplus and Sell a portion of Premium Way and a portion of Dickson Road (Ward 7)

8.21. Hiring Retired City of Mississauga Employees (01-01-09) Policy

8.22. Single Source Recommendation for Hewlett Packard Canada Co. (HPE) for supply of HPE products and related services
File Ref: PRC001676, FA.49.1130-10

8.23. Single Source Procurement - Replacement of Agenda Management System with eSCRIBE Software, File Ref. PRC001653

8.24. Single Source Recommendation for Bentley Systems Incorporated PRC001689, Contract Renewal

8.25. SAP S4 HANA Upgrade

8.26. Annual Treasurer's Statement Report: Summary of Activity in 2018

9. **ADVISORY COMMITTEE REPORTS**

9.1. Mississauga Cycling Advisory Committee Report 6 - 2019 - June 11, 2109

9.2. Towing Industry Advisory Committee Report 2 - 2019 - June 17, 2019

9.3. Accessibility Advisory Committee Report 3-2019 - June 17, 2019

10. **MATTERS PERTAINING TO REGION OF PEEL COUNCIL**

11. **COUNCILLORS' ENQUIRIES**

12. **OTHER BUSINESS/ANNOUNCEMENTS**

13. **CLOSED SESSION**
(Pursuant to Subsection 239 (2) of the Municipal Act, 2001)

13.1. A proposed or pending acquisition or disposition of land by the municipality or local board - Delegation of Authority to Approve and Execute an Acquisition Agreement during City Council Summer Recess (in Ward 1)

13.2. Advice that is subject to solicitor-client privilege, including communications necessary for that purpose - HuLRT Agreements Update

14. **ADJOURNMENT**

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 2019/06/11

To: Chair and Members of General Committee

From: Janice Baker, City Manager & CAO

Originator's files:

Meeting date: 2019/06/26

Subject
The Mississauga Entrepreneurship and Innovation Study

Recommendation
That the recommendations outlined within the "Mississauga Entrepreneurship and Innovation Study" attached as Appendices to the Corporate Report dated June 11, 2019 from the City Manager & CAO be approved subject to the annual budget process.

Report Highlights
- The Mississauga Entrepreneurship and Innovation Study was undertaken to identify the role and areas of focus for the Economic Development Office within the entrepreneurship and innovation ecosystem.
- The Study's consultation included engagement with key stakeholders: entrepreneurs; business leaders; education representatives; select members of the City's Extended Leadership Team and; members of Council on the City's Economic Development Advisory Board.
- Staff received support for the draft priority recommendations by stakeholders and partners.
- The implementation of the recommendations with financial implications will be validated through the budget and business planning processes and subject to ongoing validation and funding.

Background
Small businesses in Mississauga are a strong source of employment. The health and vitality of these establishments significantly impacts the overall well-being of the local economy. As of 2017, 17,657 non-home-based small businesses (with 0-99 employees) employed 178,112

people locally[1]. This employment accounts for 44.5% of the City's employed labour force, as recorded through City of Mississauga, 2017 Employment Survey.

The Economic Development Office (EDO) provides information and services to help businesses grow and prosper in Mississauga. Since 1999, the Mississauga Business Enterprise Centre (MBEC) has been an integral component of EDO and the local entrepreneurship and innovation ecosystem. MBEC has been assisting small business owners and entrepreneurs to start new businesses, expand existing small businesses and create jobs in Mississauga.

The local ecosystem consists of a range of other service organizations across the public, not-for-profit and private realms that also provide support for start-ups, entrepreneurs and small businesses, to start, grow and expand into commercially successful and sustainable business ventures.

As small business and entrepreneurship continues to grow in Mississauga, so too does the demands and pressures on its existing ecosystem. This reality brings EDO to a critical point to determine the most effective path forward to service local clients, seek solutions to address gaps, and enhance the services and initiatives across the local entrepreneurship and innovation ecosystem.

To address this, EDO retained a team comprised of the Canadian Urban Institute, the University of Toronto 's Impact Centre and Cash & Associates Inc. (the "Consultants") to undertake the Mississauga Entrepreneurship and Innovation Study (the "Study") and engage key stakeholders for input into key challenges, opportunities and areas of focus for EDO in Mississauga's growing entrepreneurship and innovation ecosystem.

Research included: benchmarking; trends analysis and; review of current local assets to understand service gaps. The consultation included engagement with key stakeholders: entrepreneurs; business leaders; education representatives; select members of the City's Extended Leadership Team and; members of Council on the City's Economic Development Advisory Board. Draft priority recommendations were presented to Economic Development Advisory Board for input on April 23, 2019.

Project Methodology and Timelines

Timeframe	Project Phase
Jan - Feb 2019	Gap Analysis
Feb 2019	1st Round Engagement
Feb – Apr 2019	SWOT Study and SWOT RoundTable
Apr 2019	Draft Priority Recommendations
Apr 2019	2nd Round of Engagement
Apr 23, 2019	Presentation to the Economic Development Advisory Board

Comments

The research and engagement conducted, as part of the Study, resulted in a number of priorities for Mississauga EDO to service local clients in a manner that seeks to address critical

[1] City of Mississauga, Employment Survey Data

gaps and enhance the services and initiatives in the entrepreneurship and innovation ecosystem.

The Study identified a number of key findings:

- Mississauga trails most major urban centres across Canada in creating start-ups and scaling companies;
- When it comes to rates of "start-ups" (i.e. firms with under $1M in capital), Mississauga is a relative underperformer and is, in fact, ranked second lowest after Edmonton;
- Among major urban regions across Canada, Mississauga has the third lowest rate of scaling companies (i.e. firms with over $10M of capital), exceeding only Calgary and Edmonton;
- The entrepreneurship and innovation ecosystem in Mississauga lacks a focal point and clear brand (i.e. sector/industry reputation);
- Mississauga has key champions in the entrepreneurship and innovation ecosystem that can be leveraged to provide resources and connections for businesses to scaleup and commercialize, and that can support growth in terms of access to financing, talent, networks and expertise.

The Study's findings resulted in a number of priority recommendations that were refined subsequent to input from the Economic Development Advisory Board, and presented to the Library Leadership Team on May 13th; RIC Board of Directors on May 17th; stakeholders invited to the previous engagement sessions May 28th and; the City's Leadership Team on June 6th.

- Recommendation #1: Strengthen the start-up ecosystem by making information more accessible to start-ups in all sectors, youth, new comers and traditional main street businesses through multiple points of access anchored by a downtown location in Central Library. Identify small businesses with high growth potential and stream for additional support.
- Recommendation #2: Focus on scaling high growth companies by aligning the City's scale up strategies with other orders of government. Identify companies on their way to an Initial Public Offering (IPO), and build a network of support in terms of financing, talent, networks and expertise.
- Recommendation #3: Develop plans to strengthen innovation space for scaleups in Mississauga by leveraging existing and new partnerships through a detailed analysis and business model that outlines a plan for the innovation space including public/private partnerships, governance, location and measurements for success.
- Recommendation #4: Create an Identity for Mississauga within the Toronto Waterloo Tech Corridor by determining a priority focus as a way to differentiate Mississauga.

Staff received support for the draft priority recommendations emanating from these subsequent engagement sessions. The presentation outlining the Study's key findings and priority recommendations has been appended (see Appendices 1).

In addition to the support received for priority recommendations; other suggested triggers from the implementation of each recommendation include, but are not limited to: capacity to advance recommendations; public readiness; external triggers; and ongoing need assessment and validation.
Where additional funding changes and significant service level changes are required, these items will be brought forward for Council's approval.

Strategic Plan

The Mississauga Entrepreneurship and Innovation Study supports the City's Corporate Strategic Plan to be driven by an active innovation agenda. As articulated in the City of Mississauga Strategic Plan (2009), the City aspires to be a 'global city for creativity and innovation'. Under the Plan's 'Prosper' pillar, it is intended that the City will cultivate creative and innovative businesses.

Financial Impact

There are no financial impacts for recommendations 1 and 2 of the Study. The Economic Development Office has the resources and capacity to advance the effective service delivery to the start ups and scale up community by enhanced and innovative partnerships within City resources and existing partners.

Financial impacts resulting from the Study's recommendations 3 and 4 that have capital implications will be further validated through a detailed analysis of a business model and will not advance without funding, opportunities for public/private partnerships and identified growth triggers in a business case. If required, the business case would be submitted through the budget and business planning processes.

Conclusion

The Mississauga Entrepreneurship and Innovation Study addresses themes of: fostering a culture of innovation; creating opportunities for entrepreneurship to thrive; providing effective service delivery; and aligns with the Strategic Plan.

The Study's recommendations provide important direction for the Economic Development Office and help focus resources, capital investments and service planning.

Attachments

Appendix 1: Entrepreneurship & Innovation Study Presentation to GC

Appendix 2: Mississauga Entrepreneurship & Innovation Study Reprort - DRAFT

Janice Baker, FCPA, FCA
City Manager & CAO

Prepared by: Bonnie Brown, Director, Economic Development

ENTREPRENEURSHIP & INNOVATION STUDY

Appendix 1 – Presentation to General Committee – June 26, 2019

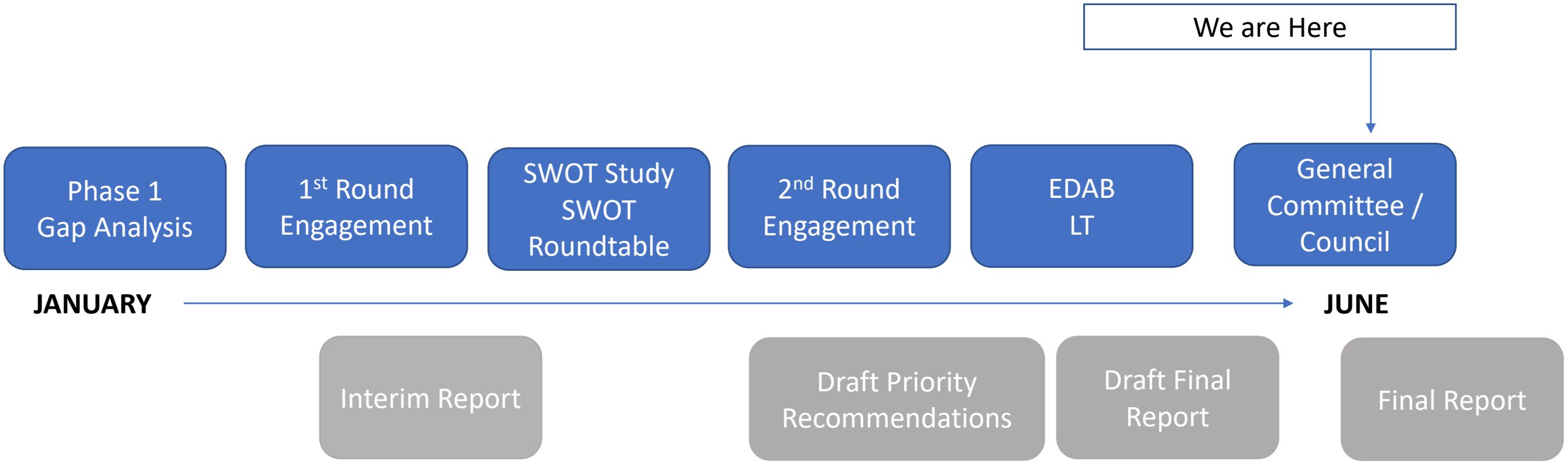
IMPACT CENTRE
UNIVERSITY OF TORONTO

CASH & ASSOCIATES INC.
ECONOMIC DEVELOPMENT • STRATEGY

BACKGROUND

1. **Why the study is being done?**
   - To understand the current state of the entrepreneurship and innovation ecosystem - local assets (e.g. services/programming), stakeholders and service gaps
   - To identify EDO's role and areas of focus in the regional E&I ecosystem
2. **What is the E&I Ecosystem?**
   - … "range of service organizations across the public, not-for-profit and private realms providing support for start-ups, entrepreneurs and small businesses to start, grow and expand into commercially successful and sustainable business ventures." City of Mississauga (RFP PRC001071)
3. **Who is doing the study?**
   - Canadian Urban Institute, U of T's Impact Centre, Cash & Associates Inc.
4. **Why are we here?**
   - Information sharing and endorsement to proceed to GC for endorsement by Council

PHASES OF THE STUDY

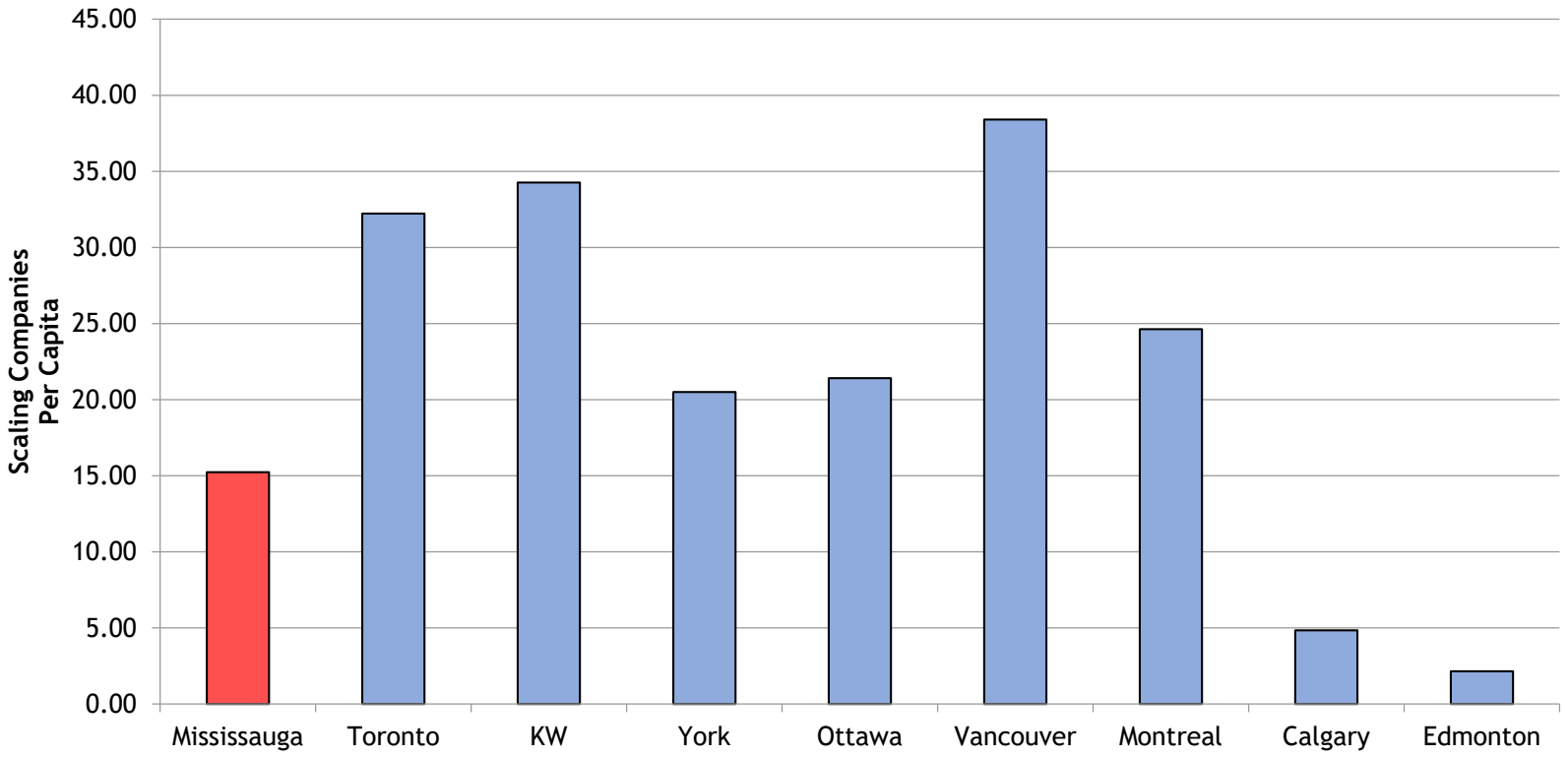


WHAT WE LEARNED

- Small business growth is positive.
- Small businesses that grow & scale up to 100+ employees have declined.
- Gap Analysis & stakeholder engagement indicated need for:
  - formal hub or “Innovation Centre”
  - a place for peer-to-peer interaction or “collision space”
  - a membership-based network of innovators and entrepreneurs
  - an E&I brand for Mississauga
  - asset co-ordination to help companies ‘connect the dots’
  - better access to assets to support scale - up

WHAT WE LEARNED

Number of Companies Starting versus Scaling in Major Canadian Urban Centres



The concept of “scaling” and “scaleup” is emerging as a central policy theme in innovation

WHAT WE LEARNED

"MARS, COMMUNITECH, INVEST OTTAWA RECEIVING $52.4 MILLION FOR "FIRST-OF-ITS-KIND" SCALE-UP PROGRAM" APRIL 16, 2019

"the three hubs will also ensure that innovation centres in smaller communities in Ontario will have access to scale-up programming, advisory services, and support"

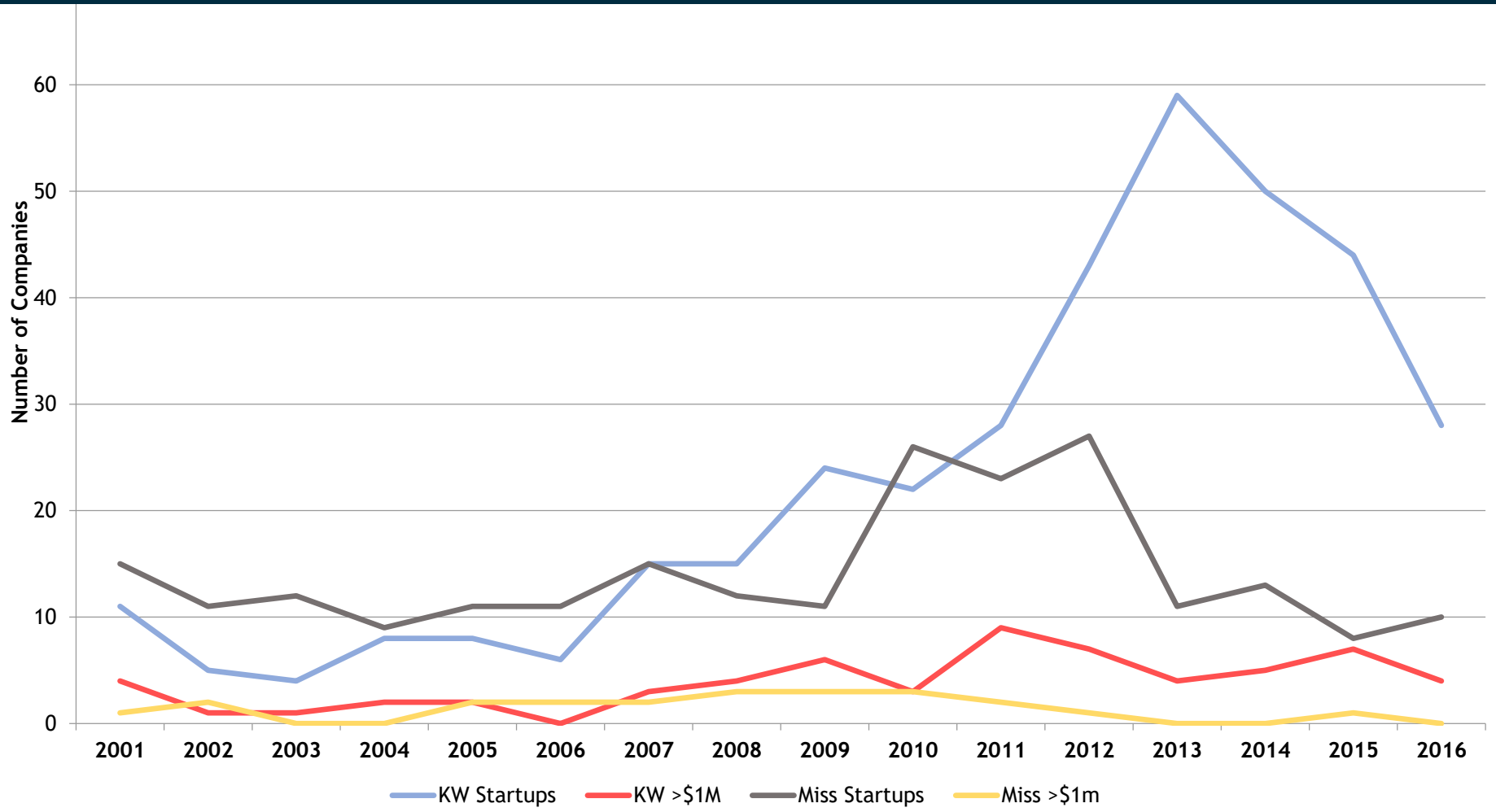
FEDS ANNOUNCE $52 MILLION NETWORK CONNECTING ONTARIO'S TOP INNOVATION HUBS

"The funding will help implement the "Scale-Up Platform" program that will help innovative companies grow more quickly"

"National scale-up data platform launched to help Canadian tech companies grow"

Higher order governments' policy and program support is shifting away from start-ups to an increasing focus on scaling up high-growth firms.

WHAT WE LEARNED



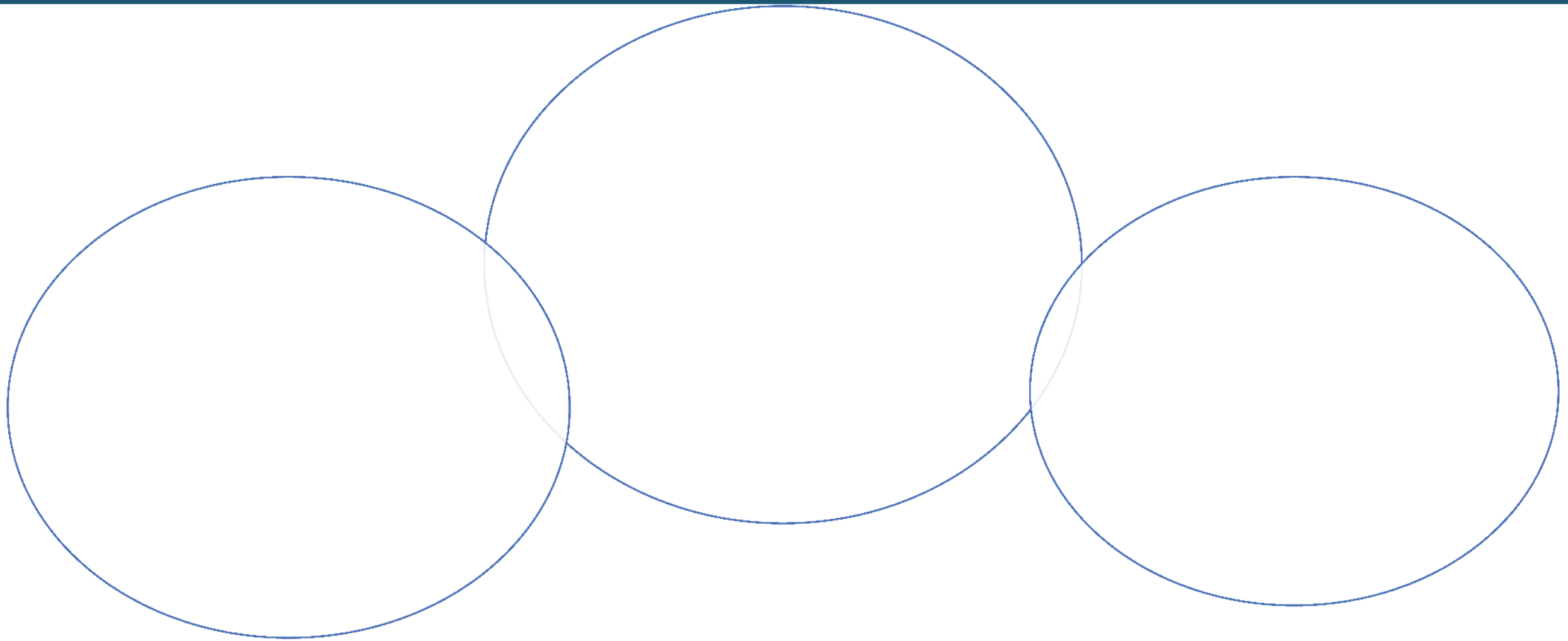
While KW's results are improving, Mississauga's results are declining.

WHAT WE LEARNED

Mississauga has strengths

- A very strong life sciences cluster in terms of public companies and is in the number two spot in Canada.
- Private company data shows primary strength in the areas of cleantech and healthcare.
- Public company data shows that Mississauga is a leader in the health tech sphere.
- Advanced manufacturing, health tech, and cleantech were the most prominent in securing public funds, suggesting possible areas that could be further nurtured.

EMERGING ROLES FOR EDO



EMERGING TWO - LAYER E&I STRATEGY

Strengthen Startup Ecosystem

- Distribute information and services through multiple points of access

Identify & Stream High Growth Small Businesses

Focus on High Growth Scaleups

- Align the City with scaleup strategies at other orders of government

PRIORITY RECOMMENDATIONS

1. Strengthen the startup ecosystem

- Make information more accessible to start-ups in all sectors, youth, newcomers and traditional main street businesses.
- Distribute information and services through multiple points of access anchored by a downtown location in the Central Library.
- Identify small businesses with high growth potential and stream for additional support.

PRIORITY RECOMMENDATIONS

2. Focus on scaling up high growth companies

- Align the City with scaleup strategies at other orders of government.
- Identify companies on their way to an IPO and build a network of support in terms of financing, talent, networks, and expertise.

PRIORITY RECOMMENDATIONS

3. **Develop plans to strengthen innovation space for scaleups in Mississauga by leveraging existing and new partnerships.**

   - Develop a detailed analysis and business model that outlines a plan for the innovation space including public/private partnerships, governance, location and measurements of success.

PRIORITY RECOMMENDATIONS

4. Create an identity for Mississauga in the Toronto Waterloo Tech Corridor

- Explore establishing a priority focus as a way of differentiating Mississauga in the Toronto-Waterloo corridor.

SUMMARY OF PRIORITY RECOMMENDATIONS

1	Strengthen the startup ecosystem.
2	Focus on scaling up high growth companies.
3	Develop plans to strengthen innovation space for scaleups in Mississauga by leveraging existing and new partnerships.
4	Create an identity for Mississauga in the Toronto Waterloo Tech Corridor.

NEXT STEPS

Council consideration	Jul 3, 2019
Final Report	Jul 10, 2019

Thank you!

JEFF EVENSON, DIRECTOR

Canadian Urban Institute (Lead Consultant)

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Canurb.org

Mississauga Entrepreneurship and Innovation Study

Draft Final Report

Prepared by the Canadian Urban Institute | 30 St. Patrick St, Toronto, ON M5T 3A3 | www.canurb.org

Acknowledgements

This report was prepared by the Canadian Urban Institute (CUI), Impact Centre at the University of Toronto, and Cash & Associates Inc. for the Economic Development Office (EDO)
of the City of Mississauga.

For CUI: Jeff Evenson, Alexandra McDonough, Keir Matthews-Hunter, Geneva Starr

For Impact Centre: Charles Plant, Emina Veletanlic

For Cash & Associates Inc.: Dave Cash

For the City of Mississauga Project Steering Committee: Gary Kent, Bonnie Brown, Heidi Brown, Michelle Browne, Harold Dremin

For the City of Mississauga EDO: Aleksandra Allen, John Barber, Bethany Dompaul

TABLE OF CONTENTS

Introduction

Purpose and Objectives

The purpose of the Mississauga Entrepreneurship and Innovation Study is to conduct research and an assessment of role of the City of Mississauga Economic Development Office (EDO) in the entrepreneurship and innovation ecosystem in Mississauga.[1]

An **entrepreneurship and innovation ecosystem** refers to the diversity of actors, roles, and environmental factors that combine or interact to support **entrepreneurship** (new firm formation) and **innovation** in a locale or region; it is a commonly used metaphor for fostering entrepreneurship and innovation as an economic development strategy (Isenberg, 2014; Malecki, 2017; Spilling, 1996). Accordingly, the motivation for this study is to identify the appropriate role and opportunities for EDO to support entrepreneurship and innovation in Mississauga for the purposes of promoting local economic development. The key objectives of the study are to:

- Identify areas of focus for EDO in the entrepreneurship and innovation ecosystem;
- Understand the current state of local entrepreneurship and innovation assets (e.g. services/programming), stakeholders, and service gaps;
- Assess the impact of the small business and entrepreneur community in Mississauga;
- Engage key stakeholders for input into key challenges and opportunities for entrepreneurship and innovation in Mississauga; and

KEY TERM

Entrepreneurship is the establishment of any business to improve the status quo or to tackle a challenge, whether standalone (venture creation) or within a corporation (`intrapreneuership').

KEY TERM

Innovation is a process through which economic or social value is extracted by creating, diffusing and transforming ideas into a new piece of knowledge, an enhancement to a process, a new product/service, or a solution to an existing problem.

KEY TERM

Entrepreneurship and Innovation Ecosystem refers to the diversity of actors, roles, and environmental factors that combine or interact to support entrepreneurship and innovation in a locale or region.

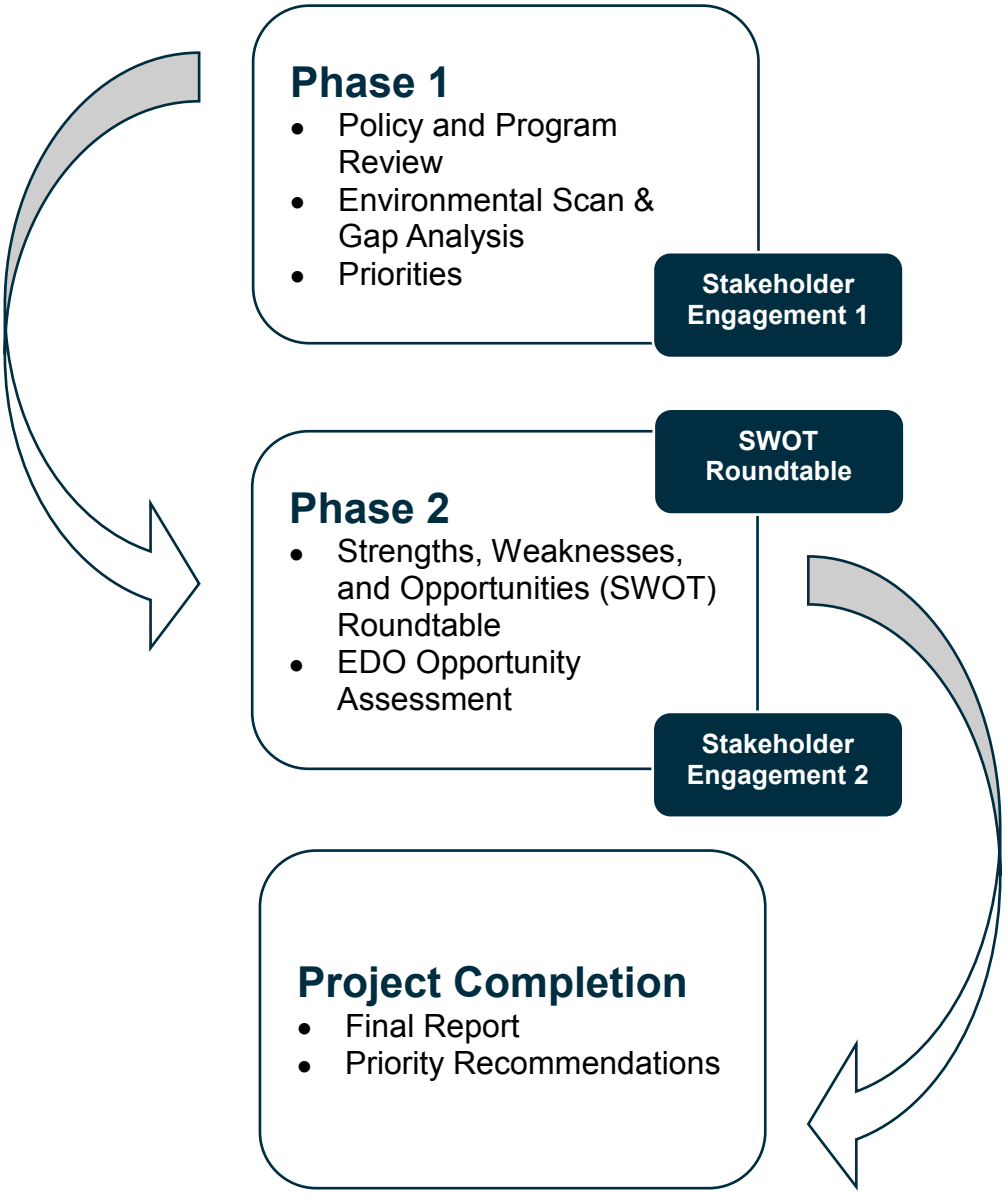
[1] The Corporation of the City of Mississauga Procurement No.: PRC001071 Request for Proposal for: Mississauga Entrepreneurship and Innovation, July2018, page 10

- Identify the resources required to support EDO's role and areas of focus and align it with those of the greater EDO Division, other City departments, and the broader entrepreneurship and innovation ecosystem in Mississauga.

The Entrepreneurship and Innovation Study was carried out in two phases (see figure 1). Phase 1 involved an environmental scan and gap analysis. The project team conducted a comprehensive analysis of existing conditions and emerging trends in entrepreneurship and innovation -in Mississauga, other Canadian urban centres, and at the provincial and federal levels of government. The team also reviewed EDO's existing definitions of key entrepreneurship and innovation terms and added or modified terms, where appropriate.

Phase 2 built on the work completed in Phase 1 and engaged key stakeholders to identify strengths, weaknesses (gaps), opportunities and constraints for entrepreneurship and innovation to develop priority recommendations for EDO. The findings from both phases of the study will inform new and ongoing economic development initiatives at EDO, as well as the development of the City of Mississauga's new Economic Development Strategy.

Figure 1. Phases of the Mississauga Entrepreneurship & Innovation Study



1 Policy Context for Innovation and Entrepreneurship in Mississauga

In Mississauga, several existing plans and strategies provide insight into EDO's current role in the entrepreneurship and innovation ecosystem and the role of the EDO. The City of Mississauga's strategic plan, *Our Future Mississauga* (2009), sets out a vision to inspire the world as a dynamic global city for creativity and innovation (p.). Underlying this vision is the understanding that Mississauga will become a city that values innovative and creative industries, invests in small-scale entrepreneurialism, and places an emphasis on education, arts and culture (p. 29). Under the plan's strategic pillar, `Prosper', the City is currently involved in Cultivating Creative and Innovative Businesses by pursuing five strategic goals:

- **Develop Talent** to be an international destination rich in global and local talent, including post-secondary education, creative enterprise and foreign-trained professionals who can realize their potential.
- **Attract Innovative Business** to be a dynamic, urban environment that is the preferred location for innovative, creative and knowledge-based businesses and emerging industries;
- **Meet Employment Needs** to provide the infrastructure and network of services and opportunities that business requires to thrive;
- **Strengthen Arts and Culture** to foster arts and culture as a key contributor to attracting talent, providing quality of life and supporting creative businesses;
- **Create Partnership for Innovation** to leverage opportunities with colleges, universities, centres of excellence, research institutions and cultural institutions to foster innovation;

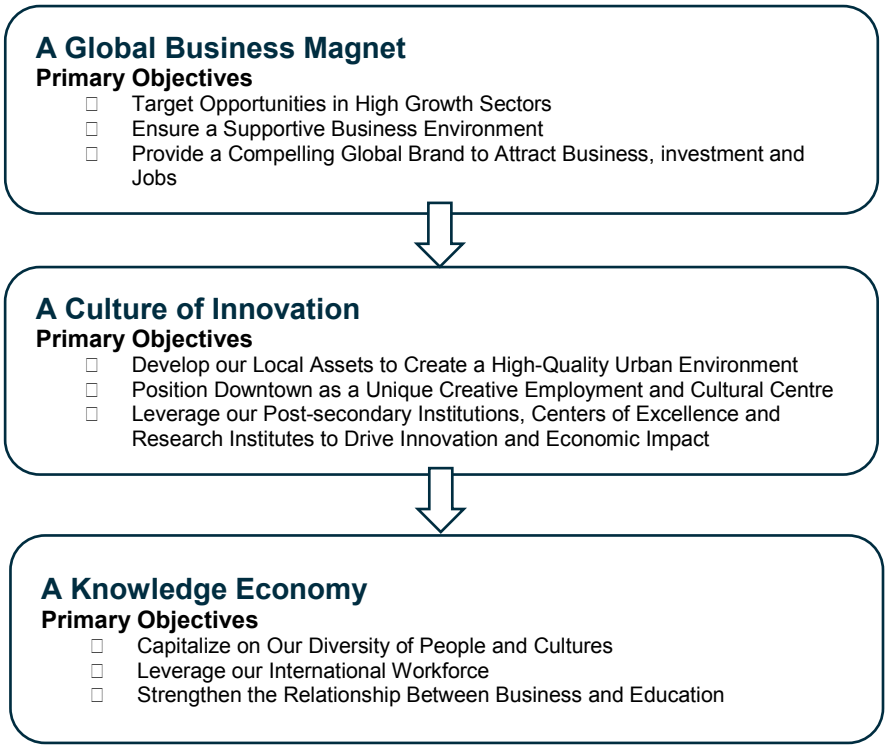
Another strategic pillar of Our *Future Mississauga* is `Belong', which involves Ensuring Youth, Older Adults, and New Immigrants Thrive. Two important strategic goals undergirding this pillar are focused on opportunities for youth and immigrant entrepreneurship:

- **Attract and Retain Youth** to create opportunities for enterprise, cultural and artistic destinations and expression; and
- **Nurture Diverse Cultures** to provide more cultural exchange, understanding and opportunity for small-scale entrepreneurialism.

The overall direction of *Our Future Mississauga* provided a framework for the development of *Building on Success* (2010), the City of Mississauga's current 10-year

Economic Development Strategy. *Building on Success* is structured around three high-level goals (each consisting of three primary objectives) that are designed to support the `Prosper' pillar in the City's strategic plan and guide strategic economic development initiatives:

Figure 2. Goals and Objectives of Mississauga's Current Economic Development Strategy



Building on Success also acknowledges the importance of four growing and emerging sectors in Mississauga: Life Sciences, Information Communications and Technologies (ICT), Advanced Manufacturing, and Financial Services. The strategy states that these sectors will continue to be a major focus for economic development and will be significant in achieving the City's goals and objectives. Targeting opportunities in these high growth sectors is the first objective in *Building on Success* and intended to help Mississauga realize its goal of becoming a global business magnet.

After *Building on Success*, the City of Mississauga, in partnership with RIC Centre, retained a consultant to assess the need for an Innovation Centre in Mississauga. The consultant found that the innovation support system in Mississauga was already delivering on several services and supports that would otherwise be offered through a new Innovation Centre and set out *An Action Plan for Innovation in Mississauga* (2011) to address impediments to innovation in Mississauga as a whole. The consultant's

central finding was that Mississauga requires a much stronger civic leadership capacity that can be engaged to deliver on the kinds of initiatives that have been identified as being important for innovation by the community

In an effort to build capacity for entrepreneurship and innovation, EDO and the Mississauga Economic Development Advisory Board held the *Dialogue on Talent* (2013) event, which brought together senior executives representing local industry, education, and government to engage in a discussion on enhancing the retention of talent in Mississauga and empowering businesses to endorse the City as a location of choice for investment. Based on input captured at the event, four recommendations for action were developed and validated to form the basis of an action plan:

- **Engaging with young people:** Create a climate that empowers young people to actively participate in career awareness and experiential learning opportunities, supported by the business community
- **Connecting younger workers with mature/experienced workers:** Create opportunities to bring together business and education that fosters dialogue to strengthen alignment between business needs and education programming and curriculum;
- **Aligning business needs with education curriculum:** Promote knowledge transfer within a multi-generational workplace; and
- **Strengthening Mississauga's innovative economy.**

Overall, EDO's stance on entrepreneurship and innovation over the past decade has been guided by major themes and objectives outlined in the City's economic development strategy, such as key sector development, international marketing, business attraction, university-business partnerships and entrepreneurship. Through the City's strategic plan and *Dialogue on Talent*, EDO's activities have been further guided by a shared understanding of Mississauga's need to attract and retain youth, maximize the integration and productivity of the City's immigrant workforce, and provide opportunities for small-scale entrepreneurialism. As the City updates the Strategic Plan's goals and nears the end of its (current) 10-year economic development strategy, EDO is looking to revisit and revamp its innovation and entrepreneurship priorities to prepare for the next era of economic development and growth.

2 Mississauga's Entrepreneurship & Innovation Ecosystem

2.1 Entrepreneurship & Innovation Assets

2.1.1 EDO and the Mississauga Business Enterprise Centre

Within the City of Mississauga, a primary entrepreneurship and innovation asset is EDO. Located within the City Manager's Office, EDO is composed of 15-20 staff resources. EDO is home to the City's core economic development staff and functions; it consists of senior and administrative staff, business and marketing consultants, account managers, and a research analyst. It's service areas include global business investment, sector development, and research and marketing.

MBEC is responsible for EDO's small business and entrepreneurship service area. Located on the fourth floor of the City of Mississauga Central Library, MBEC is the primary source of information, guidance, and resources for small business owners and entrepreneurs who are looking to start new businesses or expand existing ones. MBEC provides key services such as business registrations and business plan reviews, holds seminars and events, and delivers small business and entrepreneurship programs funded by the Province of Ontario. MBEC is also part of a network of 54 Small Business Enterprise Centers (SBEC) across Ontario.

SBECs provide services and supports to entrepreneurs within a municipality and surrounding Service Region to start and grow their businesses. The SBEC program was established in the mid-1980s with a select number of pilot Business Self-Help Offices (BSHOs). Today, the program is funded by the Ministry of Economic Development, Job Creation and Trade (MEDJCT) and is part of the Ontario Network of Entrepreneurs (ONE) a provincial initiative that is designed to help entrepreneurs start, grow, and finance their businesses.

2.1.2 Mississauga Entrepreneurship and Innovation Asset Inventory

Mississauga is home to a number of public and private sector organizations providing varying degrees of services and support (assets) to entrepreneurs and innovators. The study team reorganized and updated the city's asset inventory list to serve as a more effective tool for catalyzing partnerships, identifying EDO opportunities, and implementing those opportunities. We used the categorization employed in the report entitled *Asset Mapping Roadmap: A Guide to Assessing Regional Development Resources* (Council on Competitiveness, 2007)) using the following major asset types

- Human capital, including K-12 and higher educational institutions;
- Research and development institutions;
- Financial capital; and
- Connective organizations.

Table 1. Updated Mississauga Entrepreneurship and Innovation Asset Inventory by Major Asset Type

Major Asset Type	Number
Connective organizations	**30**
Support network	20
Industry/cluster associations	5
Business and economic development organizations	5
Financial capital	**76**
Government programs	37
Venture capital	36
Angel investors/networks	3
Research and development	**737**
Corporate R&D	697
Co-working space	28
Business incubator	7
Research centres	5
Human capital	**5**
K-12	3
Four-year colleges and universities	1
Specialized workforce	1
Grand Total	**848**

Note:

[1]Source: Impact Centre at the University of Toronto; City of Mississauga EDO

In the end, the list was updated to include approximately 670 additional entries, increasing the total number of assets on the previous list by more than fourfold. The complete list of assets is included as a separate Excel file to remain a living document that should be updated regularly. Due diligence is also needed to identify assets that no longer exist or are not appropriate to be considered an innovation asset.

2.1.3 Entrepreneurship & Innovation Key Champions

An entrepreneurship and innovation ecosystem thrives when it is supported by a core of well-established large businesses that provide mentorship, local and global connections, and, in some cases, catalytic funding for start-ups and entrepreneurs seeking to scale. Mississauga has a strong core of leading private and public companies headquartered in Mississauga that can be leveraged as key champions to the entrepreneurship and innovation ecosystem.

These organizations include:

- Concordia International
- Covalon Technologies
- EnerSource
- Fielding Environmental
- Grasshopper Solar
- GreenCentre Canada
- MedAvail technologies
- Nytric Ltd.
- Optiva
- PointClickCare
- SOTI Inc.
- The Green Organic Dutchman
- Xerox Research Centre of Canada

Post-secondary institutions have also been identified as key champions in the entrepreneurship and innovation ecosystem, providing vital workspace, resources and connections for businesses to scaleup and commercialize their services and goods. Within Mississauga, the University of Toronto at Mississauga (UTM) and Sheridan College are ecosystem champions, specifically UTM's I-CUBE and the Mississauga Sheridan Innovation Hub within the EDGE Entrepreneurship Hub.

The Regional Innovation Centre (RIC) was also developed as a key asset for entrepreneurs and innovation in Mississauga.

2.2 Asset Co-ordination

Successful innovation-fostering organizations (such as Communitech in Kitchener-Waterloo) effectively solve the asset coordination problem. A deep understanding of when assets come into play plus an actual process for moving companies through all the stages is critical to addressing the asset co-ordination challenge. This helps:

- Identify gaps, redundancies, and inefficiencies in service offerings;
- Gain insights into formal or informal linkages between entities in the region or with organizations outside the region, and;
- Identify the stage of the entrepreneurship and innovation process at which each asset would be most valuable (e.g. extract the greatest economic or social value).

Although Mississauga has a number of supports in the eco-system, Mississauga lacks a coordinated effort on asset co-ordination.

3 Changes that Impact Mississauga's Entrepreneurship & Innovation Ecosystem

3.1 Shifting Policy Focus from Startups to Scaleups

While continuing to provide information and service support to small businesses, the shifting entrepreneurship and innovation policy and program landscape is one that municipalities need to understand to effectively align priorities with other orders of government and economic growth strategies. Research institutes, public policy experts, and government agencies around the globe are re-considering the allocation of public resources to small startups and paying greater attention to businesses with a demonstrated ability and desire to scale

Federal and provincial governments appear to be captured by economic development initiatives that go beyond entrepreneurship and small business formation and are instead driven by efforts to produce world-class businesses that compete on the global stage.

As the old (industrial) economy shifts to a new (post-industrial) economy, federal and provincial governments' policy and program support is shifting away from start-ups to an increasing focus on high-growth firms.

Strategies to support entrepreneurs and innovation recognise two different types of entrepreneurial companies: small- and medium-sized businesses and (high growth) scaleups.

3.1.1 Small- and Medium-sized Businesses (SMBs)

Small- and Medium-sized Businesses (SMBs), also referred to as small- and medium-sized enterprises (SMEs), are new and existing businesses that serve local populations but are not trying to scale. This classification would probably include all companies started by necessity-driven entrepreneurs and may include ones who are opportunity-driven but with small scope. These do not drive higher income per capita, local wealth, or significantly grow the overall economic pie.

3.1.1.1 SMB Needs

All entrepreneurs have a basic set of needs that have to be met to enable them to prosper such as:

- Access to technical information on regulations and procedures for establishing a business;
- Access to knowledge and training about business management and development;
- A network of service suppliers in areas such as law, accounting, and banking;
- Physical space for operations;
- Access to personnel;
- Access to debt capital;
- Mentorship; and
- Supportive community.

KEY TERM

Small- and Medium-Sized businesses (SMBs) are new and existing businesses that serve local populations and are not trying to scale.

3.1.1.2 Scaleups

A **scaleup** is a firm with an average annual rate of employment growth or turnover above 20% over a three-year period, and with more than 10 employees at the beginning of the period. Scaleups employ quick growth- and export-driven strategies and business models to gain significant market penetration and generate revenues sustainably without adding substantial resources. This classification would likely encompass all opportunity-driven entrepreneurs with businesses that have a large potential scope. It would certainly include all businesses that have raised some capital and are attempting to scale. All scaleups are considered high-growth, but not all high-growth firms are considered scaleups. Scaleup founders are entrepreneurs that drive economic growth in a city or region.

KEY TERM

A **scaleup** is a firm that experiences an average annual rate of employment growth or turnover above 20% over a three-year period, with more than 10 employees at the beginning of the period. Scaleups employ quick growth- and export-driven strategies and business models to gain significant market penetration and generate revenues sustainably without adding substantial resources.

3.1.1.3 Scaleup Needs

In addition to the basic needs of all entrepreneurs, scaleups require a specialized set of resources:

- Regulatory and standards information;
- Protection of intellectual property;
- Access to specialized export markets;
- Access to capital;

- Access to manufacturing and supply channels;
- Enhanced knowledge in a variety of subjects, depending on the market (e.g. political/cultural context of customers internationally);
- Each key sector from information and communications technology (ICT) and healthcare to advanced manufacturing and finance, insurance and real estate (FIRE) will necessitate a different specialized set or combination of resources.

3.2 Shifting Government Funding Support

3.2.1 Support for High Growth Companies

Our team conducted a scan of over 30 global, federal, provincial, regional and municipal policies, strategies and directives to identify key policy and program themes in the areas of small business, entrepreneurship, and innovation[2]. The scan suggests that innovation policy and program support is shifting away from start-ups to high-growth firms and scaleups. Federally, there is a focus on growing high-potential companies, with a target to double the number of high-growth firms in Canada by 2025 (as reflected in the 2018 federal budget).

Several resources that we reviewed discussed how simply enabling entrepreneurship will not necessarily lead businesses to become high-growth firms.

Developing an interconnected entrepreneurship and innovation ecosystem has been identified as an effective strategy for providing the critical resources and connections that high-growth companies need to succeed.

[2] The full scan is available in the Appendix package available upon request.

The following are key lessons for creating effective partnerships and practices in Mississauga's entrepreneurship and innovation ecosystem:

- Large established businesses should be at the core of the ecosystem to exchange knowledge and provide mentorship.
- Policy intervention needs to take a holistic approach and address diverse stakeholders, including entrepreneurial actors, resource providers, and entrepreneurial connectors.
- Fostering relationships with post-secondary institutions is critical for innovation and commercialization, as these institutions have taken on a critical role providing research and development as well as infrastructure (incubators and accelerators) for entrepreneurs.
- Collaboration is key, and the innovation hub/meeting place model has the potential to increase innovation and strengthen individual firms. Some projects currently underway at the City will provide space and opportunities to create clusters, including the Inspiration Lakeview Innovation Corridor and the revitalization of the Central Library as a Digital Showcase.
- The Mississauga Library System is a well-known venue for small business information and support through the co-location of the Enterprise Center in Central Library.

3.2.2 Review of Funding Programs

A review of programming opportunities through the Ministry of Economic Development, Job Creation and Trade (MEDJCT) was undertaken[3]. These programs provide the following type of support:

- Social/cultural entrepreneurship and enterprise (e.g. Social Enterprise Demonstration Fund, Procurement and Investment Readiness Fund, Interactive Digital Media Fund);
- Economic development and diversification (e.g. Eastern Ontario Development Fund, Southwestern Ontario Fund, Communities in Transition Program);
- Innovation and R&D locally or globally (e.g. Ontario Research Fund, Low Carbon Innovation Fund, Ontario-Jiangsu Partnership, Ontario-Israel Partnership, Jobs and Prosperity Fund);

[3] The full review is available in the Appendix package available upon request.

- Youth entrepreneurship (e.g. Entrepreneurship Learning Stream, Youth Skills Connections Program, Summer Company)
- Main street businesses (e.g. Digital Main Street, Starter Company Plus).

While some programs provide financial contributions directly to private companies, others provide funds to non-profit organizations, consortia, networks, and business associations that support these companies. Provincial programming focuses largely on innovative and technology-driven business, with limited resources available to main street businesses.

The recent change in leadership in Ontario has had some implications for regional support available to small businesses and entrepreneurs. With ongoing cuts to funding for various programs and services, the status of many provincial entrepreneurship programs is uncertain. Some programs appear to have active websites, while others have been archived or are inactive without calls for proposals. For the 3 year fiscal period commencing April 1, 2019, the City of Mississauga has received confirmation of provincial funding to deliver entrepreneurship related programs and services with modest reduction as compared to previous provincial funding arrangements. Of note, the province of Ontario is undergoing a review of the Regional Innovation Centres (RIC Centres) with expectation of report delivered in Fall 2019.

Given the changes in provincial support, many firms in Ontario attempt to support their R&D activities by tapping into federal funding sources, which tend to be more stable and predictable than provincial programming. This is illustrated by table 2, which provides a (non-exhaustive) sample of firms in Mississauga that were found to rely on multiple government programs.

Table 2. Mississauga Firms with Contributions (Past/Current) from Multiple Government Agencies

Firm	National Research Council (NRC)	Ontario Economic Development (OED)	Ontario Centres of Excellence (OCE)	Sustainable Development Technology Canada (SDTC)
2Source Manufacturing	✗	✗		
AbCelex Technologies	✗		✗	
Agfa	✗		✗	
Ambiance Data	✗		✗	
Baylis Medical Company	✗	✗	✗	
Concept Plastics	✗	✗		
Cyclone Manufacturing	✗	✗		
Dynamic Systems Group			✗	✗
Electrovaya	✗	✗		✗
Escord Manufacturing	✗		✗	
Gracious Living Innovations	✗		✗	
GVA Lighting	✗		✗	
Hybrid Power Solutions	✗		✗	
Hydrogenics	✗	✗		✗
Imtex Membranes		✗		✗
Infinity Testing Solutions	✗		✗	
Integran Technologies		✗	✗	✗
Myndtec	✗		✗	
PinPoint GPS Solutions	✗		✗	
Pratt & Whitney Canada		✗	✗	
Pulse Microsystems	✗		✗	
Safety Power	✗		✗	
SceneDoc	✗		✗	
Signifi Solutions	✗		✗	
Springpower International	✗	✗	✗	✗
Temporal Power		✗		✗
Tenova Goodfellow	✗			✗
Therapure Biopharma	✗	✗		
Ultrafit Manufacturing	✗		✗	
Vive Crop Protection			✗	✗

Notes:

[1]Analysis conducted by the Impact Centre based on funding recipients in various public databases.

3.3 Trends in Key Communities and Sectors

3.2.3 Scaling

The concept of scaling and scaleup[4] is emerging as a central policy theme in innovation. Policy experts and innovation practitioners have criticized Canada's innovation system for its inability to grow and scale companies. This may come as a surprise, given that Canada's technology sector has been successful at starting companies and generating innovations with high potential.

Identifying the root causes of the scaling problem has proved to be a challenging endeavour. Certainly, the shortage of venture capital (VC) is frequently cited as a contributing factor. The reasoning is that since Canada does not have the capital available to fuel late-stage growth, our high-tech companies are sold off before they have a chance to become globally competitive players.
A study conducted by the Impact Centre (2017) at the University of Toronto highlights three issues:

- Canadian companies wait longer before they start raising funds,
- They raise funds less often, and
- They raise less money over time when compared to their American counterparts.

The lesson for EDOs, business advisors, policy experts, and government agencies involved in scaling Canadian firms is that smaller companies should be encouraged to begin raising funds earlier, more often, and in larger amounts. This way firms could spend more money on critical functions and position themselves as attractive investment opportunities to fuel further growth.

3.2.4 Life Sciences

The life sciences sector is seen as a promising growth area for Mississauga. Life sciences can be divided into three primary areas: (1) health tech software; (2) devices and equipment for health; and (3) biotechnology, drug discovery and development. Our review of active life sciences companies in Canada and the US is summarized in table 3. We have organized firms according to whether they are starting or scaling, using $10 million as a cut-off between early-stage and growth companies. The results

[4] A **scaleup** is a firm with an average annual rate of employment growth or turnover above 20% over a three-year period, and with more than 10 employees at the beginning of the period. Scaleups employ quick growth- and export-driven strategies and business models to gain significant market penetration and generate revenues sustainably without adding substantial resources (see Section 3.1.1.2 above)

illustrate that US has five times as much capital available to both new and growing companies on a per capita basis. The gap widens for more established businesses, where our southern neighbour has six times as much investment capital for scaling companies. Within the US, Massachusetts has displayed the strongest performance relative to its state counterparts, followed by California.

Table 3. Health Technology Investment Capital Per Capita

	Canada	Ontario	US	California	Massachusetts
Capital per 1 Million Population	57	66.8	298.6	939.9	2930.2
Scaling					
Over $10 Million	46.8	54.6	276.1	893.1	2816.1
Starting					
Under $10 Million	10.1	12.3	22.5	46.1	114.1

Notes:
[1]All figures are expressed in thousands (000s).
[2]Source: CB Insights

Previous research conducted by the Impact Centre suggests that these trends in health technology innovation are linked to at least three factors:

1. There is misalignment between researchers and commercialization objectives.
2. From the perspective of the entrepreneur, the system for commercializing health technology is overly cumbersome with multiple overlapping parts as well as funding and assistance gaps.
3. The healthcare system is not adequately aligned to purchase innovation that comes out of the health technology system.

While Mississauga's EDO has not played an active role in scaling companies in this sector, there may be opportunities to act as a broker and bring parts of the system together to create more opportunities for entrepreneurs.

3.2.5 Physical Technologies

Government agencies in Canada typically focus investments on four key sectors: ICT, biotechnology, cleantech and advanced manufacturing. In doing so, they omit physical technologies[5], which have a much greater impact on the economy of Canada than other sectors.

[5] We define physical technologies as technologies arising from academic research in faculties of engineering and departments of chemistry, physics, earth sciences, and space sciences.

- They contribute almost eight times as much to Canada's GDP as does the combined effort of the ICT and biotechnology industries.
- Industries employing physical technologies substantially outspend traditional ICT and pharma sectors when it comes to R&D.
- Worldwide, leading physical technology companies spend more in total on R&D than either ICT or life sciences, and are granted a significantly larger number of patents.

While Mississauga has not played an active role in the physical technologies sector, there is a potential role for Mississauga in bringing resources together and enabling physical technology companies to access those resources in a more expeditious manner. Some of EDO's existing work in areas such as advanced manufacturing and cleantech already encompasses physical technologies.

3.2.6 Improving Access to Business Support for Underrepresented Groups

In Mississauga, significant attention has been paid to providing business support to youth, seniors, newcomers, women, social enterprises, and other groups. Governments that provide this type of support to individuals from these groups believe that they face systemic barriers that warrant public intervention and support to promote equal opportunity.

3.2.6.1 Youth

Since 2013 funds from Ontario have helped support the Campus-Linked Accelerators Program for on-campus entrepreneurship, outreach programs for entrepreneurship in high schools, and the Summer Company and Starter Company youth entrepreneurship programs. These latter two are administered by MBEC in Mississauga. This level of activity has contributed to Ontario's reputation as one of Canada's major hubs for youth entrepreneurship (Global Entrepreneurship Monitor, 2017).

3.2.6.2 Women

Although progress has been made in closing labour force disparities between Canadian women and men, significantly more effort is required to reach parity in entrepreneurship. A recent study conducted by Statistics Canada found that, between 2005 and 2013, women-owned enterprises were highly underrepresented in the Canadian economy (especially among larger enterprises), accounting for between 11% and 19% of all enterprises, depending on the firm size (Grekou et al., 2018).
Several persistent barriers stand in the way of women occupying an even position in the field of entrepreneurship, including:

- Access to capital is critical during healthy business growth, but women face additional challenges due to ageism and sexism. Women are also underrepresented among funding and venture capital organizations making investment decisions.
- Women often perform the bulk of unpaid child care and domestic labour, making entrepreneurship a significant challenge in earlier career stages. For this reason, women are more likely to become entrepreneurs at a later point in life.
- Lower entrepreneurship among women can leave newer generations of female entrepreneurs with fewer role models, mentors, and networks. Persistent social biases and attitudes can also hider women's ability to build trust-based business relationships (Allan et al., 2018).

Although the barriers confronting women entrepreneurs are becoming increasingly recognized, Mississauga's current economic development strategy makes no mention of gender disparities in entrepreneurship, or how such disparities hinder the realization of economic development objectives.

3.2.6.3 Newcomers

Mississauga is one of the most diverse cities in the country. As of 2016, more than 53% of the City's population was composed of immigrants. While immigration can have a positive economic impact on a region in a number of indirect ways (e.g. provision of new skills, expansion of the labour force), immigrants also contribute directly to new business and job creation (Canadian Citizenship & Immigration Resource Center, 2018).

Immigrants face many barriers to establishing and growing their businesses that are not faced by non-immigrants. These include language and cultural barriers, potentially weak social and business networks, difficulty understanding the legislative and regulatory environment for businesses, and additional difficulty accessing financing (Cukier et al., 2017; El-Assal, 2018). New immigrants also often experience difficulty having their foreign credentials recognized, which can lead them to un(der)employment, low-paid and/or exploitative work, and domestic stress.

The City of Mississauga strategic plan has firmly established the need to support new immigrants through more cultural exchange, understanding and opportunity for small-scale entrepreneurialism.

In addition, the City's economic development strategy highlights the need to provide continued support to the accreditation of foreign-trained professionals and recognition of foreign credentials, in order to maximize the integration and productivity of Mississauga's immigrant workforce (p.45).

In 2019, EDO will be delivering a new Youth and Immigrant Entrepreneurship Program, which will support the entrepreneurial potential of local youth (ages 15 to 29) and recent immigrants (arriving in Canada within the last 5 years) by providing targeted client service delivery and programming and building stakeholder relationships with various agencies servicing youth and newcomers. The program will be delivered through MBEC and is expected to commence in October 2019.

4 Building Mississauga's Success

4.1 Measuring Entrepreneurs & Small Business Activity

4.1.1 Current Indicators

Mississauga currently assembles and represents StatsCan data on entrepreneurial activity related to the following indicators - establishments and employment, industry representation, small business geographic concentration, small business employment, small business growth patterns, entrepreneur and small business ranking, and key sector small business ranking.

4.1.2 Entrepreneur and Small Business Rankings

4.1.2.1 Small Business Employment

While Mississauga remained the sixth largest city in Canada by total population in 2016, comparative to other major Canadian municipalities, as of December 2017, Mississauga had the seventh largest small business community accounting for the 20th largest share of total employment. Mississauga's drop to seventh place in terms of small business presence is attributed to Vancouver. While Vancouver represents the eighth largest Canadian city by population in 2016, as of December 2017 Vancouver had the fourth largest small business community behind Toronto, Montréal and Calgary.

KEY TERM

Small businesses are business establishments with 1 to 99 paid employees.

Additionally, of Canada's ten most populous cities, Mississauga ranked last in terms of the proportion of the total employment base that is employed by small businesses in 2017. Comparatively, Brampton ranked the highest, followed by Hamilton and Vancouver. This ranking signifies that

...while small business remains an important economic driver, Mississauga's presence of large and multi-national corporations plays a significantly more important role to local employment as compared to other major Canadian cities.

Table 4. Overall Small Business Ranking for Major Canadian Municipalities, 2017

	2016 Population Rank	2017 Small Business Employment Ranking
Brampton	9	1
Hamilton	10	2
Vancouver	8	3
Calgary	3	4
Edmonton	5	5
Ottawa	4	6
Montréal	2	7
Winnipeg	7	8
Toronto	1	9
Mississauga	6	10

Notes:
[1] Employment estimates are based on business counts and assume zero employment for businesses without employees (i.e. self-employment for businesses without employees is excluded).
[2]Source: Statistics Canada, Canadian Business Counts December 2017

4.1.2.2 Canada's Most Entrepreneurial Cities

The 2016 Census indicates that of Canada's most populous cities, Vancouver ranked as the most entrepreneurial city with 14.5% of residents identifying as self-employed in 2016. In comparison, Mississauga ranked fourth, following Toronto and Montréal.

Table 5. Ranking of Canada's Most Entrepreneurial Cities for Major Canadian Municipalities, 2017

	Population Rank	Self-Employed Population	Total Class of Workers	% of Entrepreneurs	Entrepreneurial Rank
Vancouver	8	52,880	364,670	14.50%	1
Toronto	1	182,930	1,437,545	12.73%	2
Montréal	2	100,565	863,910	11.64%	3
Mississauga	6	44,275	382,205	11.58%	4
Calgary	3	79,910	713,140	11.21%	5
Brampton	9	33,255	310,435	10.71%	6
Hamilton	10	28,085	271,985	10.33%	7
Ottawa	4	50,965	501,090	10.17%	8
Edmonton	5	47,915	527,415	9.08%	9
Winnipeg	7	29,570	375,625	7.87%	10

Note:
[1]Source: Statistics Canada, 2016 Census

4.1.2.3 Key Sector Small Business Ranking

Table 6. Mississauga Key Sector Small Business Rankings, 2017

	Small Business Establishments	Small Business Employment
ICT	5	4
Life Sciences	5	2
Aerospace	3	1
Automotive	2	1
Food & Beverage	4	3
FIRE	7	7

Notes:
[1] Employment estimates are based on business counts and assume zero employment for businesses without employees (i.e. self-employment for businesses without employees is excluded).
[2]Source: Statistics Canada, Canadian Business Counts December 2017

Mississauga's key sector small business community ranks competitively in comparison to other major Canadian municipalities. December 2017 rankings for small businesses remained consistent with overall key sector rankings with the exception of finance, insurance and real estate (FIRE) employment, where small business employment

ranked lower (seventh position) as compared to overall Mississauga FIRE employment (fifth position). Aerospace and automotive represented Mississauga's strengths, ranking first across major Canadian municipalities for total small business employment. The following table provides an overview of Mississauga's key sector small business rankings.

4.1.2.4 Connection Between Small Business and Economic Vigour

Countries with a large fraction of small companies are often stagnant in terms of economic vitality as individuals start small businesses when there are fewer other opportunities for employment (Henrekson and Sanandaji, 2014). As a good example of this phenomenon, one can look at entrepreneurship rates in countries such as Mexico, Greece, Italy, South Korea, and Turkey. These countries have the highest rates of self-employment according to the OECD. The US with all its economic heft, on the other hand, has the second lowest rate of self-employment.

4.1.2.5 The Need for New Indicators

Unfortunately, since the data used to measure business success is aggregated, it does not offer enough granularity to differentiate between the range of businesses in Mississauga that may have significantly different needs (i.e. traditional/main street vs. high-growth firms). These indicators also do not tell us anything about the nature of small business in Mississauga, which makes it difficult to state whether Mississauga is doing well or poorly in particular sectors. For that reason, we have completed a more granular analysis as described in the following sections.

In developing metrics for Mississauga, the first type of companies we need to take a closer look at are the ones in the new economy. Mississauga has identified certain key sectors: ICT; life sciences; aerospace; automotive; food & beverage and FIRE. Of these, ICT, life sciences and aerospace tend to be more new economy-oriented. In addition, there are new economy sectors under the umbrella of advanced manufacturing (e.g. clean tech) that need to be evaluated as well.

4.1.2.6 A Focus on High Growth Companies

Policies in other countries have also moved beyond startup to focus on scaleups and high-growth small businesses. An example comes from the United Kingdom (UK) where commentators see growing smaller companies as a force for regional revival (Scaleup Institute, 2015). Recent reports suggest staggering trends with respect to contributions to growth and job creation in the UK alone: nearly 20% of UK's economic growth comes from these high-growth small businesses, which generate one in three new jobs.

Table 7. Summary of Academic Studies on Relationship Between Fast-Growing Businesses and Job Creation

Study Authors	Conclusion
Birch and Medoff (1994)	A small number (4%) of ongoing firms create a disproportionately large share of all new jobs in the USA (60%)
Kirchhoff (1994)	4% of firms produce 75% of employment in studied cohorts
Storey (1994)	Approximately 4% of firms create approximately half the new jobs in studied firms
Storey (1994)	
Birch et al. (1995)	Gazelles account for all new jobs in the whole economy
Picot and Dupuy (1998)	Job generation concentrated to a few fast-growing firms in the sample
Autio et al. (2000)	High-growth firms increased their employment by more than 400%
Bruderl and Prisendorfer (2000)	A small number (4%) of rapidly growing firms are crucial for job generation
Schreyer (2000), Canada	High-growth firms contribute a disproportionately large part of job creation among studied firms
Sweden in Schreyer (2000), Davidsson and Delmar (2003, 2006), Delmar et al. (2003)	Gazelles created all new jobs in the investigated population
Littunen and Tohmo (2003)	High-growth firms accounted for all jobs created in the investigated population
Fritsch and Weyh (2006)	A small proportion of the firms dominate job creation in the studied cohort
Halabisky et al. (2006)	Fast-growing firms generated the bulk of new jobs in the private sector
Acs and Mueller (2008)	Gazelles in large, diversified metropolitan regions generate long-term employment growth
Acs et al. (2008)	High-impact firms (2□3% of all firms) create almost all net jobs in the economy
Deschryvere (2008)	High-growth firms (&5% of all firms) generate more than all net jobs in the economy. Firm size and organic growth negatively related

Note:

[1]Source: Table reproduced from Henkreson and Johansson (2010).

These fast-growing companies have in some cases been referred to as □gazelles□, □unicorns□ or □cheetahs□. But they all capture the notion of a small businesses with remarkable growth. Other reports estimate that these types of firms contribute up to half of the new jobs created, new employment growth in related industries, and operations across multiple geographies (Erwing Marion Kauffman Foundation, 2016). This is further supported through a number of academic studies that show young and fast-

growing companies as major job creators. Some of these assessments were summarized in meta-study on the interplay between fast-growing businesses and job creation (see Table 7). Certainly, while not all entrepreneurial ventures are destined for such growth trajectory, the challenge for policy makers is to identify high-growth small businesses. They are typically spread across a broad range of industries, which doesn't make for a cohesive group. This and their small size help explain why they're easy for policymakers to miss within the wider [small to medium sized enterprises] sector (Scaleup Institute, 2015).

When put together, all of these studies and data suggest that economic success in countries and in cities goes beyond small business and entrepreneurship rates and is driven through the production of world-class businesses that compete on the global stage. Virtually every study completed over the last 20 years supports the proposition that economic development is driven by high-growth companies with the potential to scale.

4.2 Measuring Scaleups

The City of Mississauga has provided us with statistics to begin the process of measuring scaleups. Some of the data is reproduced here.

4.2.1 Traditional/Main Street vs. High-Growth Small Businesses

Small business can be categorized as high-growth or traditional/main street small businesses or both high growth and traditional/main street. As defined in earlier sections, traditional/main street small businesses represent the social fabric of the community and range from non-employee businesses and home-based businesses to main street businesses and suppliers. As outlined by the Ontario BIA [Business Improvement Area] Association, main street businesses can be catalysts of local street appeal, economic development and community building (OBIAA 2017).

High growth firms are defined by Industry Canada and the US Bureau of Labor Statistics as follows:

- A firm with fewer than 10 employees and growth of 8 or more employees over a three-year period; or
- A firm with 10 or more employees and growth at an average annualized rate of more than 20% over a three-year period.

Table 8 below presents the number of Mississauga's high-growth businesses and their employment by industry, across 2014-2017. 12,877 business were identified as falling within both the 2014 and 2017 City of Mississauga Employment Surveys, and whose

record could be matched between both years (of approximately 20,000 business records in 2014). From this set, 2,757 businesses were excluded due to missing employment data, leaving 10,120 businesses for analysis. This set of 10,120 businesses were used in the analysis.

Of the 10,120 businesses, 9,717 (96%) were identified as small in 2014 (less than 100 employees) these small businesses employed 100,099 people (see Table 8 below). Of the 9,717 small businesses in 2014, 1,688 (17.4%) satisfied the criteria for high growth outlined above (HGFs). These 1,688 HGFs employed 9,995 FTEs in 2014. By 2017, these 1,688 HGFs employed 111,129 FTEs, an increase of 101,134 over the three years (or a 988% increase from the 2014 level).

Manufacturing, Wholesale, Retail and Other Services accounted for the three highest shares of employment gains from HGFs. Wholesale HGFs added 16,447 FTEs (16.1% of total added), Other Services HGFs added 16,195 FTEs (15.9% of total added), Retail HGFs added 12,677 FTEs (12.4% of total added), and Manufacturing HGFs added 10,888 FTEs (10.7% of total added). These three industries are not typically associated with R&D or innovation (other than in the implementation of new technologies created in other sectors) and furthermore, emerges in reaction to growth in other sectors. This indicates a lack of export-oriented high growth firms in Mississauga, and the currently important role that main street type businesses play in the high-growth small business economy.

Another way to assess the prevalence of HGFs across industries is to look at the ratio of each industry's share of added employment from HGFs over each industry's share of total employment in 2014 (including both HGFs and non-HGFs) this captures whether an industry's prevalence of HGF firms is greater than its overall prevalence in the economy. For example, Manufacturing accounted for 10.7% of added employment from HGFs, and in 2014 Manufacturing accounted for 15.4% of employment overall. (10.7% divided by 15.4% results in a ratio of 0.69). This indicates HGF employment added from Manufacturing was lower than could be expected based on Manufacturing's share of employment overall.

The top four industries using the HGF Ratio were Utilities (2.44), Management of companies and enterprises (1.88), Arts, entertainment and recreation (1.70), and Other services (1.45). Of note, HGF Ratios were also high for Information and cultural industries (1.23) and Professional services (1.28).

These are important trends to monitor as high-growth small businesses not only have a high growth trajectory, but also generate meaningful employment and are the most likely of all types of businesses to grow into world-leading firms creating new markets

and industries. However, the data presented in Table 8 below does not differentiate which high-growth small businesses are also scaleups or have the potential to become world-class firms.

Table 8. 2014-2017 Mississauga High-Growth Small Businesses by Industry

	Number of High-Growth Small Businesses, 2014 [6]	2014 Employment	2017 Employment	2014-17 Employment Gains	2014-17 Percentage Growth
Unknown	4	90.5	315.5	225	248.6%
22 - Utilities	5	29.5	265.3	799.2%	699.19%
23 - Construction	39	259.0	1,801.2	595.4%	495.43%
31-33 - Manufacturing	221	1,400.5	12,227.4	773.1%	673.07%
41 - Wholesale trade	225	1,686.5	18,049.8	970.3%	870.25%
44-45 - Retail trade	217	1,096.5	13,667.2	1146.4%	1046.43%
48-49 - Transportation and warehousing	91	577.5	5,393.7	834.0%	733.98%
51 - Information and cultural industries	14	148.0	930.8	528.9%	428.89%
52 - Finance and insurance	52	363.0	2,362.1	550.7%	450.71%
53 - Real estate and rental and leasing	31	123.0	1,990.5	1518.3%	1418.32%
54 - Professional, scientific and technical services	133	675.0	8,326.6	1133.6%	1033.57%
55 - Management of companies and enterprises	5	47.5	1,300.0	2636.8%	2536.84%
56 - Administrative and support, waste management and remediation services	44	263.0	2,648.6	907.1%	807.07%
61 - Educational services	75	515.5	6,575.8	1175.6%	1075.62%
62 - Health care and social assistance	123	593.0	6,487.4	994.0%	894.00%
71 - Arts, entertainment and recreation	23	166.5	2,649.0	1491.0%	1390.98%
72 - Accommodation and food services	148	758.0	8,286.3	993.2%	893.18%
81 - Other services (except public administration)	228	1,117.5	17,190.5	1438.3%	1338.30%
91 - Public administration	10	85.0	661.3	678.0%	578.00%

	Number of High-Growth Small Businesses, 2014 [6]	2014 Employment	2017 Employment	2014-17 Employment Gains	2014-17 Percentage Growth
Total	**1,688**	**9,995.0**	**111,128.9**	**1011.8%**	**911.85%**

Notes:
[1]Source: City of Mississauga, 2014 and 2017 Databases

Although the data above provides useful information about broad trends, it does not permit a more nuanced analysis of the progress that the City of Mississauga is making at scaling new-economy businesses. To provide external validated indicators of innovative activity, we propose to use the following three metrics:

- **Government grants.** The use of government supports for industrial R&D, innovation and similar activities among Canadian businesses is well established. The analysis of public funds will allow us to examine changes in the per-capita rate of granting and to gauge Mississauga's performance in securing public funds against its peers.

- **Patents.** By looking at patents, particularly those granted in the US, we can identify firms that are likely preparing for growth in foreign markets and that are devoting time and dollars to secure intellectual property in the preparation for that growth.

- **Capital acquisition.** To attain world-class status, firms need to acquire capital. Particularly if they are seeking to grow rapidly, capital is essential. As much of the growth capital is provided by venture capitalists, we can evaluate how Mississauga companies are doing at obtaining capital to fuel their growth.

Each metric effectively requires external validation, meaning that external parties (e.g. grant evaluation committees, patent officers, investors) have looked in on the activity and determined that it is innovative and/or has the potential for economic growth, and therefore deserves to be funded or is worthy of recognition as intellectual property.

4.2.2 Government Grants

Provincial and federal supports represent major sources of funds for entrepreneurship and innovation work among Canadian companies. The number of programs delivered through ministries and public organizations has proliferated in recent years. Most programs provide subsidies to encourage business investment in R&D but demand some matching funds from the businesses as a sign of buy-in. Government money remains a permanent fixture in the Canadian innovation ecosystem. It is an important source of funds for companies at all stages: for startups as they begin operations, for SMBs to reduce the burden of R&D on limited resources, and for large/multinational

companies to conduct R&D at a discounted rate. These funds aim to get companies over any barriers standing between some and no R&D.

Since businesses of all sizes tap into government programs to subsidize the development of their products, processes, and services, government support is an effective innovation indicator and proxy of the level of R&D within enterprises. We have used data available from a number of provincial and federal agencies to assess the concentration of supports captured by Mississauga and to identify organizations engaging in R&D. We have relied in particular on the following sources: the Ontario Centres of Excellence (OCE), Government of Ontario economic development funding, and select federal government programs.

Overall, our analysis suggests that Mississauga firms lag in securing major public funds for innovation, commercialization, and related talent. Without access to the actual applications submitted, it is difficult to state whether Mississauga companies:

- Are not conducting R&D and hence do not need supports;
- Are applying for R&D supports but not succeeding, or
- Rely on their own funds to support R&D.

The results of our examination of each funding source is below:

4.2.2.1 Ontario Centres for Excellence (Provincial Funding)

OCE is a provincial agency that has been the major administrator of provincial funds for startups and innovation in sectors considered of high priority by the Ontario Government, particularly energy and environment, advanced manufacturing, health tech, ICT and digital media. OCE offers a number of programs that help companies and entrepreneurs commercialize innovations generated in Ontario's colleges, universities and research hospitals and that also help develop the next generation of innovators. The latter is achieved through entrepreneurship fellowships and programs for Ontario students and youth.

OCE has invested a total $317M across Ontario in the last five years. The table below ranks the performance of the various cities/towns across the Province. The analysis suggests that businesses in the City of Mississauga have either not tapped into OCE as a resource or not been very successful at securing funds: collectively, they captured just 2.2% of all OCE commitments between 2013 and 2018. A full list of OCE funding recipients in Mississauga, is available in the Appendix package available upon request.

Table 9. Ontario Centres of Excellence Commitments Across Ontario (2013-18)

Rank in Ontario ***Absolute funding***	**Rank in Ontario** ***Funding per capita***	**City/Town**	**Absolute funding** ***in 2017 constant $***
1	15	Toronto	$ 109.8M
2	11	Hamilton	28.0M
3	1	Waterloo	24.5M
4	23	Ottawa	20.5M
5	12	Markham	17.1M
6	17	London	12.9M
7	16	Kitchener	9.1M
8	6	Kingston	8.9M
9	13	Oshawa	8.1M
10	7	Chatham-Kent	7.1M
□	□	□	□
17	47	Mississauga	3.7M

Note:

[1]Source: Analysis based on funding recipients in OCE's funding database.

4.2.2.2 Government of Ontario Economic Development Funding

Government of Ontario funding is an umbrella term for a wide range of economic development programs administered directly by the Province, largely by what is now known as the Ministry of Economic Development, Job Creation and Trade (MEDJCT) and its past incarnations (e.g. Ministry of Economic Development and Growth, MEDG). The programs included in our benchmarking analysis include investments through major provincial funds since the 2004-05 fiscal year:

- Advanced Manufacturing Investment Strategy (AMIS)
- Eastern Ontario Development Fund (EODF)
- Innovation Demonstration Fund (IDF)
- Jobs and Prosperity Fund (JPF)
- Low Carbon Innovation Fund
- Next Generation of Jobs Fund (NGOJF)
- Strategic Investments (SI)
- Strategic Jobs and Investment Fund (SJIF)
- Southwestern Ontario Development Fund (SWODF)

Together these programs have provided about $3.6B in grants and/or loans to Ontario entrepreneurs, companies, and researchers in the last 15 years for a range of

projects□ from productivity and export activities to commercializing low-carbon technologies.

The following tables provide insight into Mississauga's performance along with the largest beneficiaries of these funds.

Relative to other Ontario towns and cities, Mississauga is ranked relatively low in absolute funding and funding per capita awarded to it by the Province. Firms received only 3.1% of all Government of Ontario contributions (loans or grants).

Table 10. Contributions Disbursed Through Government of Ontario Programs (2004-05 to 2017-18)

Rank in Ontario ***Absolute funding***	**Rank in Ontario** ***Funding per capita***	**City/Town**	**Absolute funding** ***in 2017 constant $***
1	37	Toronto	$ 650.0M
2	7	Windsor	304.9M
3	3	Oshawa	282.5M
4	31	Ottawa	273.6M
5	8	Oakville	235.1M
6	4	Waterloo	172.1M
7	1	New Tecumseth	152.5M
8	10	Cambridge	143.5M
9	2	Woodstock	129.0M
10	13	Guelph	119.3M
11	57	Mississauga	111.3M
□	□	□	□

Note:

[1]Source: Analysis based on funding recipients in Government of Ontario's Data Catalogues.

Table 11. Government of Ontario Economic Development Funding Recipients in Mississauga (2004-05 to 2017-18)

	Firm	Absolute funding in 2017 constant $
1	Electrovaya	$ 19,112,571
2	Pratt & Whitney Canada	15,584,443
3	Hydrogenics	10,772,995
4	Cyclone Manufacturing	8,721,498
5	Roche Canada	8,472,193
6	Silfab Solar	5,588,991
7	Therapure Biopharma	4,684,326
8	Baylis Medical Company	4,351,817
9	Magellan Aerospace	4,078,399
10	GlaxoSmithKline	3,890,401
11	2Source Manufacturing	3,574,707
12	Sumitomo Precision Products	3,482,334
13	Integran Technologies	3,175,228
14	Pride Pak Canada	2,552,034
15	Imtex Membranes	2,340,474
16	Eisai	2,175,146
17	6N Silicon	1,754,260
18	Concept Plastics	1,749,685
19	Temporal Power	1,545,237
20	Fifth Light Technology	1,424,825
21	Super-Pufft Snacks	1,030,016
22	Springpower International	753,984
23	GreenCore Composites	467,803

Note:

[1]Source: Analysis based on funding recipients in Government of Ontario's Data Catalogues.

4.2.2.3 National Research Council (federal funding)

The Government of Canada has played a critical role in investing in innovation and R&D. These investments have come both directly from federal ministries like Innovation, Science, and Economic Development (ISED) and indirectly through arm's-length federal agencies such as the National Research Council (NRC) and Sustainable Development Technology Canada (SDTC).

As a first step, we looked at how Mississauga stacks up against other major regions in NRC supports. The NRC was selected because it is the largest and oldest federal research organization supporting industrial innovation. Its programs and national network of facilities help Canadian SMBs connect with NRC's scientists, engineers and business experts to advance technology development and/or help bring new technologies to market. This is done through some of the longest-running programs like

the Industrial Research Assistance Program (IRAP) created in the 1960s. Despite the importance of NRC as a source of funds, investments in Mississauga firms are substantially lower than other major urban centres (table below).

Table 12. National Research Council Commitments to Major Canadian Urban Centres (2016-18)

Area	Grand Total
Vancouver	$86.1M
Toronto	$68.3M
Montreal	$55.0M
Calgary	$53.7M
Ottawa	$53.4M
Edmonton	$33.0M
Waterloo-Kitchener	$19.9M
Mississauga	$13.7M

Notes:

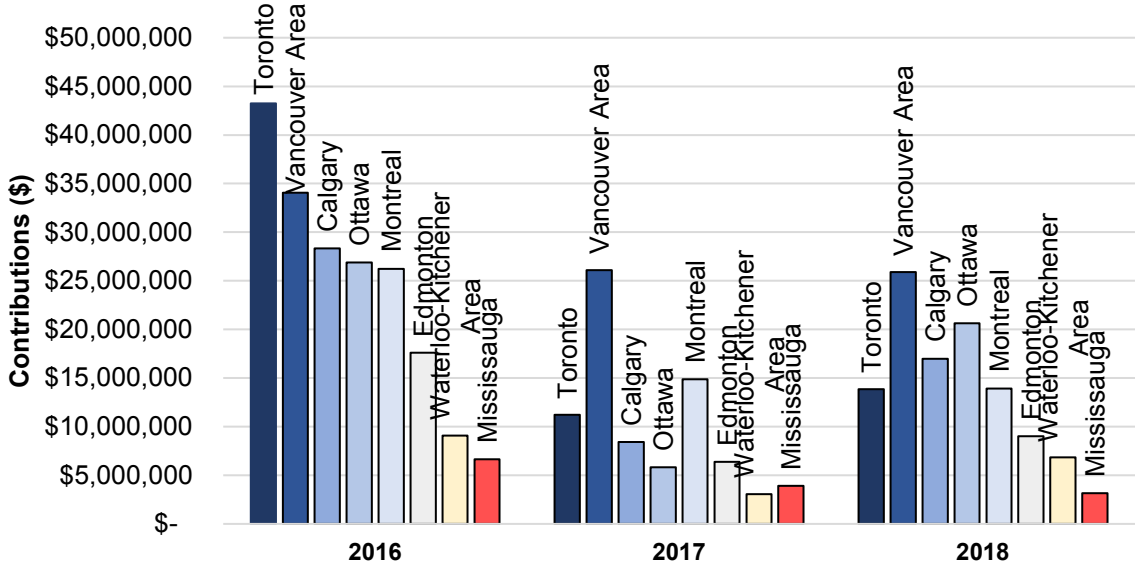
[1]Calculated based on current $ in each year.

[2]Source: Analysis based on funding recipients in Treasury Board of Canada Secretariat, Open Government Data Catalogue, Proactive Disclosures-Grants and Contributions.

When the totals are broken down further, there is a clear downward trajectory over the past three years in terms of total project investments in Mississauga (like other urban centres across the country). Mississauga also saw a dip in the number of funded projects in 2017 and 2018 (while the other cities saw a slight upswing in 2018).

The latest federal budget expanded NRC's activities for industrial innovation, which is likely to boost investments in subsequent years.

Figure 3. NRC Contributions ($) Received in Major Canadian Urban Centres, 2016-2018

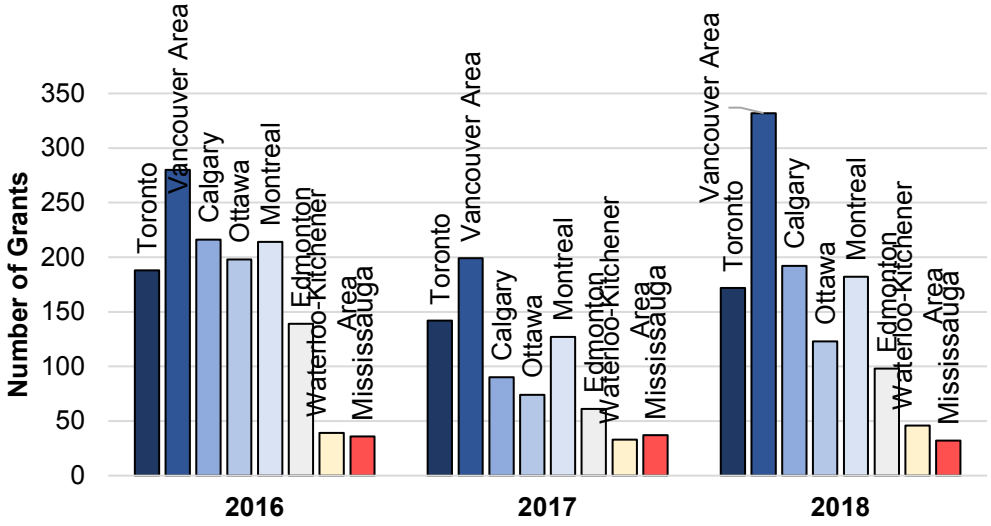


Notes:

[1] Calculated based on current $ in each year.

[2] Source: Analysis based on funding recipients in Treasury Board of Canada Secretariat, Open Government Database, Proactive Disclosures-Grants and Contributions.

Figure 4. Number of NRC Contribution Agreements in Major Canadian Urban Centres, 2016-18



Note:

[1] Source: Analysis based on funding recipients in Treasury Board of Canada Secretariat, Open Government Database, Proactive Disclosures-Grants and Contributions.

The following table lists all Mississauga organizations that have received some support from the NRC over the last 10 years ordered from largest to smallest beneficiaries (many of which are SMBs). NRC programs have supported recipients across a wide range of sectors.

Table 13. Top 25 NRC Recipients in Mississauga, 2009-18

	Firm/Organization	Grand Total ($)
1	Alliance of Manufacturers and Exporters Canada (AMEC)	4,453,000
2	ISS Communications	1,746,500
3	SOTI	1,730,000
4	Pure Technologies	1,559,001
5	IMAX Corporation	1,500,000
6	Pulse Microsystems	1,023,278
7	Veriday	968,300
8	Safety Power	770,631
9	Macro Engineering & Technology	700,000
10	Springpower International	700,000
11	Delphax Technologies	659,828
12	Electrovaya	650,000
13	Hydrogenics	645,958
14	Research Innovation	644,725
15	Baylis Medical Company	633,170
16	Allegro Wireless	560,000
17	EnercoreFX	500,000
18	RIC Centre	654,500
19	Signifi Solutions	480,863
20	Tenova Goodfellow	455,740
21	Lumen Dynamics Group	440,000
22	Microsat Systems Canada	438,246
23	Aversan	395,000
24	EXFO Photonic Solutions	390,000
25	Axiomatic Technologies	382,144

Notes:

[1]Source: Source: Analysis based on funding recipients in Treasury Board of Canada Secretariat, Open Government Database, Proactive Disclosures-Grants and Contributions.

4.2.2.4 Sustainable Development Technology Canada

While NRC tends to support a wide range of R&D areas (from crops to mining), a closer look at more focused funders may reveal niche areas for Mississauga companies. For example, SDTC is an arm's-length foundation created by the federal government to support Canadian companies in becoming cleantech leaders. It funds the development and demonstration of sustainable technologies, broadly defined as technologies related to climate change, clean air, clean water, and clean soil.

Ontario has captured about one-third (32.9%) of all SDTC funding in Canada ($1.2B since the 2002-03 fiscal year). Interestingly, Mississauga fares very well here: The City is the third-largest beneficiary in the Province, accounting for about $62.2M of contributions flowing to Ontario. Mississauga is also home to some of the top SDTC funding recipients (e.g. Electrovaya and Vive Crop Protection).

Table 14. Sustainable Development Technology Canada commitments in Ontario, 2002/03-2018/19

Rank in Ontario Absolute funding	**Rank in Ontario Funding per capita**	**City/Town**	**Absolute funding in 2017 constant $**
1	17	Toronto	84.7M
2	8	Ottawa	72.7M
3	7	Mississauga	62.2M
4	1	Sarnia	33.3M
5	6	Oakville	23.9M
6	4	Waterloo	23.1M
7	14	Vaughan	11.4M
8	19	Hamilton	10.8M
10	18	Burlington	4.8M

Note:

[1] Source: Analysis based on funding recipients in SDTC's database.

Table 15. SDTC Funding Recipients in Mississauga, 2002/03-2018/19

Firm	**Absolute funding *in 2017 constant $***
Electrovaya*	15,119,730
Vive Crop Protection*	10,063,316
Integran Technologies	7,894,484
Tenova Goodfellow	5,871,772
Temporal Power	5,527,562
Hydrogenics	5,161,291
Springpower International	3,409,631
Polar Sapphire	2,684,689
Li-Cycle	2,649,785
Imtex Membranes	1,359,119
Echologics Engineering	1,132,250
Dynamic Systems Group	843,691
NIMTech	357,100
NextGrid	134,131

Notes:

[1] **Among Top 10 recipients in Ontario;* [2] Source: *Analysis based on funding recipients in SDTC's database*

4.2.2.5 Funding Summary

The following tables summarize our analysis of funding data in absolute dollars and per capita, highlighting Mississauga's performance relative to other centres across Ontario, including Toronto, Kitchener-Waterloo-Cambridge (KWC), York Region, and Ottawa.

Table 16. Summary of Government Funding in Major Canadian Urban Centres

	Mississauga	Toronto	KWC	York	Ottawa
OCE (2013-18)	3.7	109.8	34.2	20.8	20.5
Ontario Economic Dev (2004-05 to 2017-18)	111.3	650.0	371.3	163.8	273.6
NRC (2016-18)	13.7	68.3	19.0	12.6	53.4
SDTC (2002-03 to 2018-19)	62.2	84.7	27.2	18.1	72.7
Total contributions (millions of $)	190.9	912.8	451.7	215.3	420.2

Note:
[1]Source: Analysis based on funding recipients in OCE's funding database, Government of Ontario's Data Catalogues, Treasury Board of Canada Secretariat, Open Government Database, Proactive Disclosures-Grants and Contributions, and SDTC's database.

Table 17. Summary of Government Funding in Major Canadian Urban Centres

	Mississauga	Toronto	KWC	York	Ottawa
Population (thousands)	722	2731	467	634	934
Contributions ($ per capita)					
OCE* (2013-18)	5.1	40.2	73.2	32.8	21.9
Ontario Economic Dev (2004-05 to 2017-18)	154.2	238.0	795.1	258.4	292.9
NRC (2016-18)	19.0	25.0	40.7	19.9	57.2
SDTC (2002-03 to 2018-19)	86.1	31.0	58.2	28.5	77.8
Total per capita	264.4	334.2	967.2	339.6	449.9

Note:
[1]Source: Analysis based on funding recipients in OCE's funding database, Government of Ontario's Data Catalogues, Treasury Board of Canada Secretariat, Open Government Database, Proactive Disclosures-Grants and Contributions, and SDTC's database.

OCE funding is provided to several types of beneficiaries, including researchers at higher education institutions (universities, colleges), students, more established firms as well as startups that are endorsed by university campus-linked accelerators and on-campus entrepreneurship activities at colleges. There could be several reasons for the low OCE funding provided to recipients in Mississauga; and this deserves further study. For example, University of Toronto Mississauga grants may have been allocated to the downtown campus in Toronto, or the results may signal an inactive incubator and accelerator community that has not generated a sufficiently high number of applications in the system. Although Mississauga ranks lowest in funding from Ontario Economic Development programs and the NRC, it ranks highest in contributions per capita received from SDT. This may indicate the existence of a cleantech cluster that is worthy of further attention.

4.2.3 Capital Acquisition

One of the objectives of this report is to develop metrics that could show at any point in time not only how a business performs in terms of its ability to scale but also how Mississauga as a whole is faring. In order to show where a company is situated relative to its peers, we made use of the concept of a high-tech funnel. The notion of a sales funnel is typically encountered in discussions at company level; it can show the management and sales teams where prospective or existing customers fall in terms of engagement. Thus, companies can track customers as they proceed through the stages of the sales funnel, from awareness to purchase to after-sales servicing.

Similarly, we should be able to track companies as they move through Mississauga's technology funnel, from inception and scaleup to globally competitive markets. We should also be able to measure the funnel and therefore gauge not only the progress of each company, but also the general system for innovation in Mississauga. Such a data-driven framework would help innovators and the wider innovation ecosystem identify areas of the funnel on which efforts should be concentrated to build a more effective technology pipeline.

In order to develop such a funnel for Mississauga, we divided technology companies into stages of the funnel according to the amount of capital acquired. Categories that range from inception/startup to world-class status proved particularly useful (see below for Funnel Classifications).

Table 18. Classification of Private Company Capitalization Funnel Stages

Stage	Capital raised
World Class	Over $1 billion
Scaling	$100 million $1 billion
Growth	$10 million $100 million
Emergence	$1 million $10 million
Startup	Under $1 million

Note:
[1]Source: CB Insights

To report on Mississauga's technology funnel for private companies, we relied on statistics available from CB Insights that were obtained in January 2019. Statistics were recorded for all companies that had obtained capital in internet, healthcare, software, mobile and telecommunications, computer hardware and services, and electronics (categories used by CB Insights).

The following table shows the number of private companies in Mississauga for which CB Insights has recorded financing. They are divided according to the categories described earlier:

Table 19. Mississauga Private Company Capitalization by Funnel Stage

Stage	Capital raised	Number of Private Companies
World Class	Over $1 billion	0
Scaling	$100 million $1 billion	0
Growth	$10 million $100 million	11
Emergence	$1 million $10 million	9
Startup	Under $1 million	37

Notes:
[1] Source: CB Insights

Two caveats regarding these numbers should be explained. First, the data is probably more reliable for larger companies than smaller ones as CB Insights may be more likely to miss amounts from smaller companies that are not as widely reported. Second, the failure of firms is not generally reported. For that reason, CB Insights might be more likely to miss and continue reporting on those firms that are no longer in business. But any errors associated with these factors are spread across all jurisdictions; so, the numbers still serve as good general guides.

4.2.3.1 Comparison to Other Cities in Canada

The following table compares Mississauga to major urban centres across Canada. It shows that Mississauga trails most other cities at creating startups and scaling companies.

Table 20. Private Company Capitalization by Funnel Stage in Major Canadian Urban Centres

	Stage and Capital					**Total**
	Startup	Emergence	Growth	Scale	World Class	
	Under $1 million	$1 million- $10 million	$10 million- $100 million	$100 million- $1 billion	Over $1 billion	
Mississauga	37	9	11	0	0	57
Toronto	513	160	81	6	1	761
KW	118	33	13	3	0	167
York	86	13	12	1	0	112
Ottawa	93	29	19	1	0	142
Vancouver	283	110	54	3	0	450
Montreal	218	90	36	6	0	350
Calgary	82	19	6	0	0	107
Edmonton	37	12	2	0	0	51

Note:
[1]Source: CB Insights

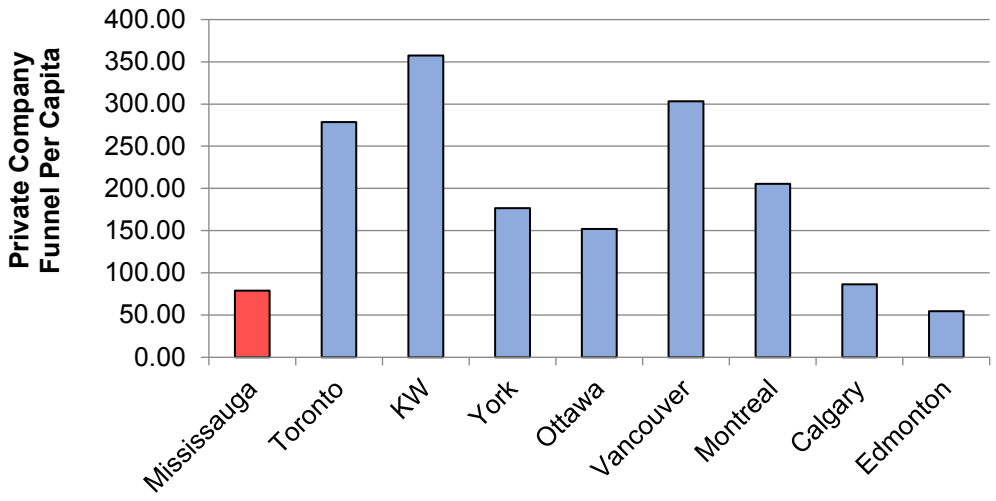
One can also look at this data in terms of percentage of population. When it comes to rates of startups (i.e. firms with under $1M in capital), Mississauga is relative underperformer and is, in fact, ranked second lowest after Edmonton. All of the calculations relating to population that follow measure the number of companies that start up or scale per one million population.

Table 21. Private Company Capitalization per Capita by Funnel Stage in Major Canadian Urban Centres

	Population (thousands)	Stage and Capital					Totals
		Startup	Emergence	Growth	Scale	World Class	
		Under $1 million	$1 million-$10 million	$10 million-$100 million	$100 million-$1 billion	Over $1 billion	
Mississauga	722	51.25	12.47	15.24	0	0	78.95
Toronto	2,731	187.84	58.59	29.66	2.2	0.37	278.65
KW	467	252.68	70.66	27.84	6.42	0	357.6
York	634	135.65	20.5	18.93	1.58	0	176.66
Ottawa	934	99.57	31.05	20.34	1.07	0	152.03
Vancouver	1,484	190.7	74.12	36.39	2.02	0	303.23
Montreal	1,705	127.86	52.79	21.11	3.52	0	205.28
Calgary	1,239	66.18	15.33	4.84	0	0	86.35
Edmonton	933	39.66	12.86	2.14	0	0	54.66

Notes:
[1]Source: CB Insights

Figure 5: Private Company Capitalization per Capita (All Funnel Stages) in Major Canadian Urban Centres



Note:
[1]Source: CB Insights

Using this concept of funnel, we can also determine how effective each jurisdiction is at scaling companies. In order to examine and compare Canada's rate of company creation to other jurisdictions, we split the funnel into two parts. We have arbitrarily classified companies with below $10M of capital as earlier-stage and companies with over $10M of capital as later-stage. The following analysis was done only on private companies as obtaining all public company records for such a study was not feasible.

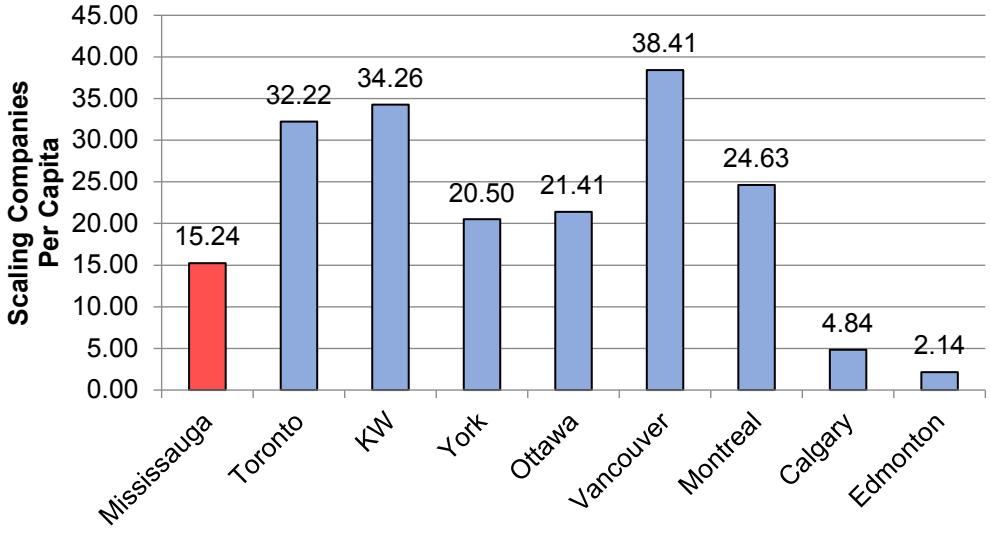
The following table shows the percentage of companies that are starting versus scaling. Among major urban regions across Canada, Mississauga has the third lowest rate of scaling companies, exceeding only Calgary and Edmonton. Its startup rate only exceeds that of Edmonton. Thus, the data shows that Mississauga is challenged to start and scale those types of companies that are more likely to produce significant economic activity and lead the city to wealth and prosperity in the future.

Table 22. Number of Companies Starting versus Scaling in Major Canadian Urban Centres

	Population (thousands)	Stage and Capital		Total
		Starting	Scaling	
		Under $10 million	Over $10 million	
Mississauga	722	63.71	15.24	78.95
Toronto	2,731	246.43	32.22	278.65
KW	467	323.34	34.26	357.6
York	634	156.15	20.5	176.66
Ottawa	934	130.62	21.41	152.03
Vancouver	1,484	264.82	38.41	303.23
Montreal	1,705	180.65	24.63	205.28
Calgary	1,239	81.52	4.84	86.36
Edmonton	933	52.52	2.14	54.66

Notes:
[1] Source: CB Insights

Figure 6. Number of Companies Starting versus Scaling in Major Canadian Urban Centres



Note:
[1] Source: CB Insights

The 57 firms identified through reference to CB Insights database of private funding show that almost $1B of private capital was invested in firms now active in Mississauga. This breaks down as follows:

Table 23. Capital Invested in Private Companies in Mississauga by Key Sector

Sector	Private Capital ($ 000)
Life Sciences	$223,840
ICT	$191,010
Advanced manufacturing	$599,280
Total	$ 1,014,130

Note:
[1] Source: CB Insights

Analysis of public company data by niche area offers additional insights. The following data shows the market value of public companies headquartered in various locations throughout Canada. (We have excluded marijuana firms as this will distort averages due to recent high valuations.)

Table 24. Valuation of Public Companies by Key Sector in Major Canadian Urban Centres

	Life Sciences	ICT	Advanced Manufacturing	Totals
Mississauga	1,954,366	324,158	4,913,970	7,192,494
Toronto	1,425,884	34,469,483	24,376,571	60,271,938
KW	0	25,200,969	0	25,200,969
York	96,313	3,054,877	6,049,808	9,200,998
Ottawa	20,810	24,689,631	0	24,710,441
Vancouver	2,700,612	5,127,229	-	7,827,841
Montreal	14,493,202	28,170,400	-	42,663,602
Calgary	777,380	2,053,748	-	2,831,128
Edmonton	77,543	65,362	-	142,905

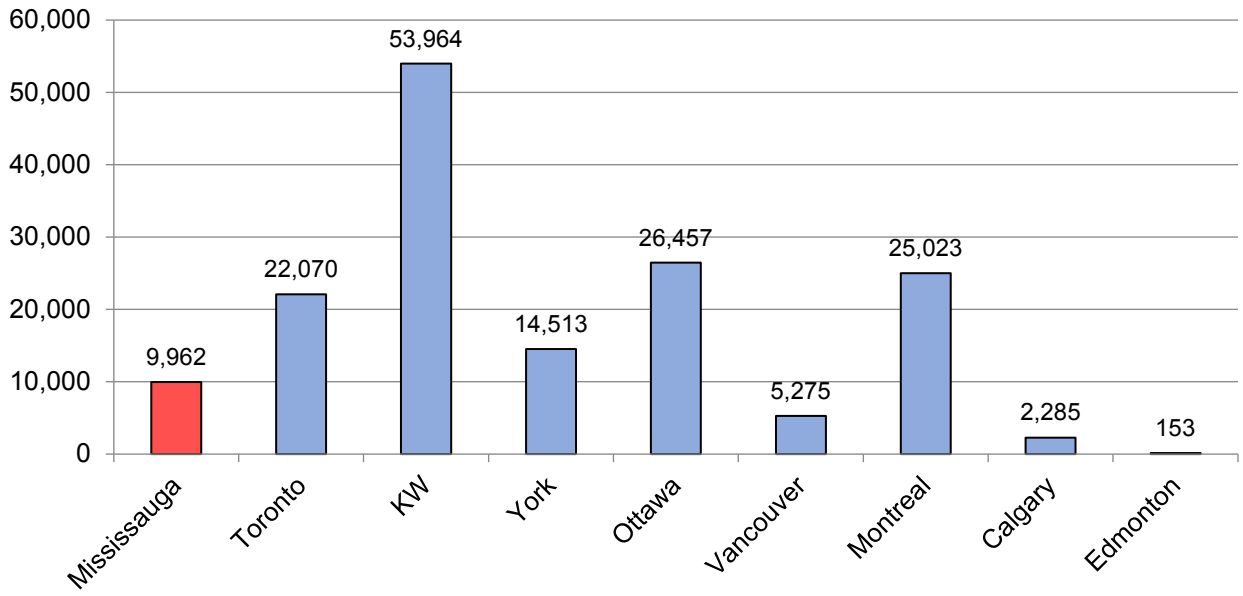
Notes:
[1]All dollar figures are in thousands (000s).
[2]Data exclude marijuana companies.
[3]Source: Toronto Stock Exchange

Table 25. Valuation of Public Companies per Capita by Key Sector in Major Canadian Urban Centres

	Population (000s)	Life Sciences	ICT	Advanced Manufacturing	Total
Mississauga	722	2,707	449	6,806	9,962
Toronto	2,731	522	12,622	8,926	22,070
KW	467	0	53,964	0	53,964
York	634	152	4,818	9,542	14,513
Ottawa	934	22	26,434	0	26,457
Vancouver	1,484	1,820	3,455	-	5,275
Montreal	1,705	8,500	16,522	-	25,023
Calgary	1,239	627	1,658	-	2,285
Edmonton	933	83	70	-	153

Notes:
[1]All dollar figures are in thousands (000s).
[2]Data exclude marijuana companies.
[3]Source: Toronto Stock Exchange

Figure 7. Valuation of Public Companies per Capita (All Key Sectors) in Major Canadian Urban Centres



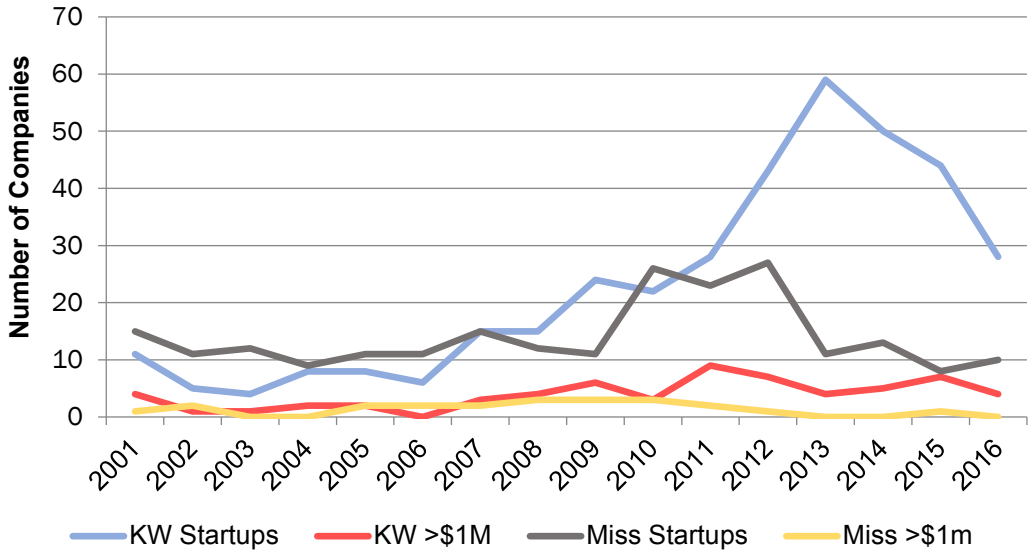
Notes:
[1]Data exclude marijuana companies.
[2]Source: Toronto Stock Exchange

Interestingly, Mississauga has an exceptionally high per-capita valuations for the health tech sector compared to other areas in Canada. The data clearly shows that Mississauga has a very strong life sciences cluster in terms of public companies and is, in fact, in the number two spot in Canada. Mississauga also appears strong in industrial firms. Details as to companies driving these sectors can be seen by reference to the leading private and public companies in the next section.

4.2.3.2 *Scaling Up Over Time*

The following chart shows the number of firms listed in Crunchbase started by year in Mississauga and in Kitchener-Waterloo (KW) as a comparison. The top two lines show the number of companies in Crunchbase. The bottom two lines show the number of companies that have raised more than $1M as identified in Crunchbase. This data is especially relevant because Mississauga is substantially larger than KW. Although Mississauga and KW started out at a similar base in the years prior to the Government of Ontario's funding of the ONE network in 2007, their trajectories diverged since then. Mississauga has improved its ability to create startups, but it has also trailed the results of KW by an increasing margin. Similarly, while KW's results are improving at starting companies that get over $1M of funding, Mississauga's results are declining.

Figure 8. Rate of Company Creation: Kitchener-Waterloo versus Mississauga, 2001-2016



Note:

[1]Source: Crunchbase

5 What We Learned

5.1 From the Gap Analysis & Stakeholder Engagement

Over the course of the Study's two phases, key stakeholders were engaged to review and refine the findings and direction. Three stakeholder sessions were held in Phase 1 to review the research including an environmental scan and gap analysis of Mississauga's E&I ecosystem. Phase 2 included two points of engagement with stakeholders: a SWOT roundtable to engage participants in identifying strengths, weaknesses (gaps), opportunities and constraints for entrepreneurship and innovation and a second set of stakeholder sessions to develop priority recommendations for EDO.

5.1.1 Gaps in Mississauga's Entrepreneurship & Innovation Ecosystem

5.1.1.1 Connective Organizations and Self-Help

- Mississauga has no member-based community organization such as Communitech that offers activities such as Peer-to-Peer counselling and events at a sufficient scale to support innovation and scaling.
- There is no easily accessible physical focal point for tech entrepreneurship (Technology and Innovation Centres).
- Mississauga lacks incubation space and flexible growth space.
- Mississauga lacks organizations that focus on scaling up and commercialization.

5.1.1.2 Asset Co-ordination

- Successful innovation-fostering organizations (such as Communitech in Kitchener-Waterloo) effectively solve the asset coordination problem. A deep understanding of when assets come into play plus an actual process for moving companies through all the stages is critical to addressing the asset co-ordination challenge. This helps:
    - Identify gaps, redundancies, and inefficiencies in service offerings;
    - Gain insights into formal or informal linkages between entities in the region or with organizations outside the region, and;
    - Identify the stage of the entrepreneurship and innovation process at which each asset would be most valuable (e.g. extract the greatest economic or social value).
- Although Mississauga has a number of supports in the eco-system, Mississauga lacks a coordinated effort on asset co-ordination.

5.1.1.3 Financial Capital and Access to Funds

- Mississauga firms are not securing major available public funds for innovation, commercialization and related talent, specifically:
    - Ontario Centres of Excellence (OCE) grants; and
    - Natural Research Council funds
- There is no defined approach for assessing funding requests to EDO.

5.1.1.4 Support for Start Up

- Based on the Statistics Canada Business Count data, if home-based and unclassified small businesses (with and without employees) are included, Mississauga has experienced 6.5% growth in number of small businesses between 2016 and 2018, growing from 87,762 to 93,458. This growth gives an indication of rate of small business startups in Mississauga and the potential constituency for small business services. Of the 5,690 businesses created in this period, over 90% appear to have formed without government assistance.
- MBEC could explore working with other City departments to develop more automated and online support for small business startup information.

5.1.1.5 Support for Scaling Up

- Currently, EDO does not perceive itself to have a role in scaleups, deferring to others. Unfortunately, other parties are not adequately serving scaleups, and this area remains underserved.
- The entrepreneurship and innovation ecosystem in Mississauga is not aligned with the federal and provincial efforts to expand the scope of services to scaleups.
- Consequently:
    - Compared to other major urban centres, Mississauga has a gap in creating startups and scaling companies.
    - Mississauga also lags its municipal peers in terms of scaleup resources and supports. Ottawa, Toronto, Hamilton and Waterloo are pursuing a focus on scaleups while ensuring the continued delivery of core services such as business consultations and small business programming.
- Mississauga lacks a clearly defined and navigable entrepreneurship and innovation asset map from which to build a roadmap for the coordination of assets.

5.1.1.6 Branding

- The entrepreneurship and innovation ecosystem in Mississauga lacks a clear brand (i.e. sector/industry reputation).

5.1.1.7 Scaling Up

- EDO does not perceive itself to have a role in scaleups, deferring to others. Unfortunately, other parties are not adequately serving scaleups, and this area remains underserved.
- Concept of scaling and scaleup is emerging as a central policy theme in innovation
- As the old economy shifts to a new economy, federal and provincial governments' policy and program support is shifting away from start-ups to an increasing focus on high-growth firms and new-economy scaleups.

5.1.1.8 Support for High Growth Companies

- That federal and provincial governments' policy and program support is shifting away from start-ups to an increasing focus on scaling up high-growth firms
- Federally and provincially, there is a focus to grow high-potential companies, with a target to double the number of high growth firms by 2025, which is reflected in the 2018 Federal Budget.
- The local community does not seem to be connected with federal and provincial efforts to expand the scope of service to scaleups.

5.1.2 From the SWOT Matrix

The study team undertook a Strengths, Weaknesses, Opportunities and Threats (SWOT) assessment for the EDO and the local E&I Ecosystem. The SWOT Matrix relies upon the research conducted in Phase 1 of this study, the feedback and comments from 3 Stakeholder sessions held February 4, 2019 and the review and analysis by the Study Steering Committee and consulting team.

A preliminary or draft version of the SWOT was presented to group of key stakeholders, at a Roundtable session held February 22, 2019. This session proved to be a valuable exercise, which confirmed the main SWOT elements and provided additional information to inform the study. Throughout the consultation process, the Consultants were impressed with level of commitment from participants and the quality of the input.

The complete 22 page SWOT Matrix is available in the Appendix package available upon request.

The development of the SWOT matrix provides some insight to the following issues/questions.:

1. **The integration of the EDO with broader regional initiatives**

The City's EDO (through its MBEC) is currently one player in the broader regional initiative or the E&I Ecosystem. In other words, it functions as one of the dots that must be connected by local entrepreneurs/innovators, as they try to grow and expand. The development of the SWOT has revealed the need for a leadership position for the Ecosystem, to champion the growth and development of the Ecosystem, help connect the dots and better integrate/leverage the existing resources. This could be a role for the City's EDO, along with other roles that will be examined in the Continuum of Opportunities and Recommendations (Phase 2) of this Study.

2. **The part of the start-up spectrum in which EDO has the greatest impact (e.g. discovery, seed and development, start-up, growth/expansion).**

The development of the SWOT Matrix has confirmed the EDO's current small business development services (i.e. MBEC) are targeted primarily to the start-up phase, consistent with the primary objectives of the Province's SBEC program. There is no specific focus on high growth scale-ups opportunities. While serving all small business inquiries is important, research in this Study has found the high growth scale-ups have the greatest potential to generate significant economic growth.

3. **The types or organizations that EDO most effectively addresses- small business or niche areas/target groups and sectors**

The EDO's small businesses services currently address all inquiries and have developed themes for niche areas such as youth and newcomer entrepreneurs. In 2019, the MBEC office received additional funding to support these niche areas, including a new focus on Innovation Entrepreneurship. There is no specific sector focus.

6 Moving Forward

6.1 Emerging Two Layer Strategy

The study team proposes that the EDO consider a broad two layer strategy for moving forward focused on (1) strengthening the startup ecosystem and (2) focusing on high growth startups.

1. To strengthen the startup ecosystem EDO would make information more accessible to start-ups in all sectors, youth, new comers and traditional main street businesses and distribute information and services through multiple points of access anchored by a central location in the downtown Library. It would operate this distribution and service delivery function in cooperation with other municipal departments principally the Library.

   EDO would also Identify small businesses with high growth potential and funnel these companies into a specific stream for additional support required to scaleup.

2. To focus on High Growth Startups, EDO would align the city with scaleup strategies at other orders of government and identify companies on their way to an IPO and build a network of support in terms of financing, talent, networks, and expertise.

6.2 Emerging Roles for EDO

Moving forward, the study's analysis and input from stakeholders suggests that EDO take on a responsibility for the health of the broad E&I ecosystem and work to achieve strategic outcomes through 3 types of roles:

1. **Lead Coordinator** - The EDO holds the strategic vision for Mississauga's role and identity in the innovation ecosystem locally, regionally and nationally; the EDO plays a hands-on leadership role in certain activities, which can include the coordination of assets and resources; connecting, facilitating and supporting where needed, the allocation of financial and/or staff resources and ensuring that activities meet the terms of 3rd party agreements (e.g. SBEC)
2. **Partner or Collaborator** - The EDO is one partner with other key partners collaborating with other City Departments (Internal), institutions, the wider public sector and business sectors to achieve strategic outcomes.
3. **Funder** - The EDO provides various types of financial assistance (cash or in-kind) for programming or to support a 3rd party initiative that meets strategic objectives.

6.3 Priority Recommendations

6.3.1 Strengthen the start-up ecosystem

Description:

- Make information more accessible to start-ups in all sectors, youth, new comers and traditional main street businesses by distributing information and services through multiple points of access anchored by a downtown location in the Central Library.
- Identify small businesses with high growth potential and stream for additional support.
- Involve the Library and possibly other City departments, community organizations, BIA's etc.

Rationale:

- City (through EDO) takes responsibility for performance / health of the entrepreneurship and innovation ecosystem.
- MBEC information and services are more available to startups by creating multiple points of access throughout the community.
- Meets the requirements of the provincial SBEC agreement.
- Identifies small businesses with high growth potential and streams them to receive scaleup support.

6.3.2 Focus on scaling up high growth companies

Description:

- Identify companies on their way to an IPO and build a network of support in terms of financing, talent, networks and expertise.

Rationale:

- Aligns the City with scale-up strategies at other orders of government.

6.3.3 Develop plans to strengthen innovation space for scaleups in Mississauga by leveraging existing and new partnerships

Description

- Develop a detailed analysis and business model that outlines a plan for the innovation space including public/private partnerships, governance, location and measurements for success.

Rationale

- Increases the focus on scaleups by developing partnerships with member- based groups that will increase peer-to-peer learning, events, and mentorship for scaleups.

6.3.4 Create an identity for Mississauga in the Toronto-Waterloo Tech Corridor

Description:

- Explore establishing a priority focus as a way of differentiating Mississauga in the Toronto- Waterloo corridor.

Rationale:

- Creates potential for leveraging community assets and building a more visible presence in the wider regional innovation community.

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City of Mississauga
Corporate Report

MISSISSAUGA

Date: 2019/05/28

To: Chair and Members of General Committee

From: Paul Mitcham, P. Eng, MBA, Commissioner of Community Services

Originator's files:

Meeting date: 2019/06/26

Subject
Older Adult Plan for Recreation

Recommendation
That the recommendations outlined within the Older Adult Plan for Recreation, attached as Appendix 1 in the Corporate Report dated May 28, 2019 from the Commissioner of Community Services, be approved subject to the annual budget process.

Report Highlights
- The Older Adult Plan for Recreation has a five to ten year planning horizon.
- The recommendations are summarized into four themes: older adult service delivery, older adult programming, allocation of indoor space for older adults and future older adult facility design and space needs in Mississauga.
- A series of consultations were undertaken to inform the Older Adult Plan for Recreation. Consultations included a survey of Mississauga adults and older adults ages of 45 and over resulting in 420 responses; a workshop with the Mississauga Older Adult Advisory Panel; workshops with members of Community Centre Older Adult Committees, workshops with agency and partner focus groups, (including newcomer agencies); and workshops with both Recreation Division and staff from various City of Mississauga departments whose responsibilities pertain to older adult services.
- The draft recommendations were referred to the public for feedback through an online survey and 10 public information centres which garnered more than three hundred and seventy-five (375+) participants. There was widespread support for the draft recommendations emanating from the online survey and public information centres with no significant changes to the draft recommendations required.
- The implementation is phased over a short (1-3), medium (3-5) and long (5-10) year planning horizon and is subject to ongoing validation and funding.

Background

The Older Adult Plan for Recreation (the Plan) update began in April 2018. The Plan examines the 2008 Older Adult Plan and as per the Future Directions Master Plan, identifies priorities needed to move forward over the next 10 years. The scope of the Plan is focused on the Recreation Division.

From the 2008 Older Adult Plan, a number of recommendations have been implemented including: the Formation of the Older Adult Advisory Panel, addition of the Older Adult Co-ordinator staff complement, introduction of ActiveAssist, the creation of the therapeutic line of business and development of expanded fitness membership models.

The 2019 Older Adult Plan for Recreation looked at recreational program and service delivery practices specific to the older adult market segment. Research and consultation initiatives included: benchmarking and trends analysis; demographic analysis; stakeholder and resident meetings and engagement; staff consultations; and public engagement sessions.

Monteith Brown Planning Consultants and Tucker Reid Associates were engaged to complete the Plan. Below is an outline of the key phases and timelines for the Project.

Project Methodology and Timelines

Timeframe	Project Phase
April – June 2018	Background and Research
June – September 2018	Staff, Stakeholder and Public Engagement
October – February 2019	Draft Plan Review
March – April 2019	Detailed Space Utilization Review
May 2019	Public Feedback
June 2019	Final Plan to Council for Approval

Comments

With two hundred thousand (200,000) persons in the 55+ age group in 2016 (according to Census data) accounting for twenty seven percent (27%) of the City's population and significant growth projections increasing this percentage to forty-five percent (45%) by the year 2031, the older adult population will be the largest demographic in the City of Mississauga. The greatest density of older adults currently and in the future is in the City's Central/East and Northwest areas.

Older Adult Service Delivery

The City of Mississauga Recreation Division supports a strong network of older adult clubs/providers, operates the Mississauga Seniors Centre, and offers many programs and services that are utilized by the older adult population. The Recreation Division has adopted a model that works in a diverse community where the population is aging; there are many ethno-

cultural clubs/providers that serve a specific population while others appeal to all residents. Below are the recommendations pertaining to Older Adult Service Delivery:

1. Align all Older Adult Clubs and providers to the Community Group Registry Policy and revise the policy to provide clarity on program offerings and delivery.
2. Continue the work of the Older Adult Advisory Panel and other key older adult group stakeholders to assist with the implementation of the Older Adult Plan.
3. Review operating model and space needs with Mississauga Seniors Centre membership.
4. Review the use of Older Adult Club/provider donations and Seniors Active Living Centres (SALC) grant funds to ensure a streamlined implementation in compliance with the Community Group Registry Policy recommendations.
5. Ensure the Recreation Division has the organizational structure to support the delivery of current and future older adult committees, programs, activities, processes and services.
6. Provide relevant training to all staff and volunteer executives serving older adults.

Allocation of Indoor Space for Older Adults

An analysis of the overall utilization of community centres, specifically by the older adult population in order to balance the requests from older adults for increased use of community centre spaces was completed. Below are the recommendations in relation to the Allocation of Indoor Space for Older Adults:

1. Review and revise the Master Scheduling Plan for rooms and program spaces – with all stakeholders involved.
2. Quantify demands and move the appropriate rentals and facility uses from community centres with pent up space demands to facilities with lower utilization within a given planning area, including relocation of City staff utilization (e.g. meetings, training, etc.). In doing so, the City should continue to work to accommodate summer-use requirements for older adults through the use of freed up space at facilities, utilization of facilities with capacity and the use of local and minor community centres.

Older Adult Programming

The scope of programs and services available to older adults was reviewed. This review included analysis and recommendations considering community development, volunteerism, financial sustainability, program and service offerings and measuring performance. The considerations are based on community inputs, the current participation levels, trends, research and best practices in like jurisdictions.

Below are the recommendations regarding Older Adult Programming:

1. The age definition of an older adult engaged in recreation programs and opportunities should be confirmed as being 55 years of age and above. This age definition should be consistently applied to all programs, policies and services administered throughout the Recreation Division.

2. Enhance inclusiveness and social connectedness through program delivery targeted to persons 55 years of age and over:

    - Leverage sponsorship/grants (i.e. Investigate opportunity to offer low to no cost opportunity through sponsorship)

    - Ensure a balance of programs is being offered in conjunction with Older Adult clubs/providers that are of interest to a variety of older adult populations (including but not limited to newcomers, indigenous persons, LGBTQ community, isolated seniors and diverse/marginalized groups)

3. Work with community partners to better understand the penetration rate of older adults using recreation and related services in Mississauga, and to work collectively to respond to emerging trends and issues.

Future Older Adult Facility Design and Space Needs

The facility provision model for older adult recreational space along with certain design features associated with these facilities was reviewed and below are the aligned recommendations:

1. In order to optimize recreation facility space, future additions to the supply of spaces supportive of older adult recreation programming and services should come in the form of shared and/or integrated spaces within community centres rather than a stand-alone centre dedicated exclusively to older adults. At centres that are not being redeveloped, catered spaces for Older Adult use will be incorporated as appropriate.

2. Update design standards for recreation facility development/redevelopment projects to reflect the needs of older adults through elements such as (but not limited to) comfort, accessibility, and socio-demographic needs.

3. As accessibility will be a fundamental influence in design, a coordinated approach with transportation services including MiWay, accessible parking locations, drop off lanes to offer transit to (or as close as possible to) the front door of community centres should be undertaken at the time when community centres are designed and/or redeveloped.

4. Upon opening of the Churchill Meadows Community Centre, undertake the following strategies:

    - Leverage the considerable addition of program space (including the 1,700+ weekday daytime hours) that will be available through the new Churchill Meadows Community Centre for the delivery of older adult programs and services, as part of its broader intergenerational programming/rental complement.

    - Transition programs from the Churchill Meadows Activity Centre & Library to the new Churchill Meadows Community Centre, once opened, and dedicate the available space – estimated to be in the range of 2,000 daytime hours throughout the year – at the former to be allocated towards older adult programs and services.

There was widespread support for the draft recommendations emanating from the online survey and public information sessions with no significant changes to the draft recommendations required. A summary of the feedback has been appended to the Final Report (see Appendix 1).

The Implementation Guide for the Plan prioritizes the recommendations as high, medium and low significance based on community demand and resources available to the Division. Short (1 to 3 years), medium (3 to 5 years), and long-term (5 to 10 years) timing is proposed to help staff create work plans.

Other considerations include but are not limited to: capacity to advance recommendations; public readiness; external triggers; and ongoing needs assessment and validation. Where additional funding changes and significant service level changes are required, these items will be brought forward for Council's approval. The Implementation Guide will be reviewed annually by staff to ascertain progress.

Strategic Plan

The Plan supports the City's Corporate Strategic Plan as its recommendations will advance the pillars of Connect and Belong.

Financial Impact

There are no immediate financial impacts resulting from the recommendation in this report. Any implementation and funding of future initiatives will be subject to approval through the annual budgeting business planning process.

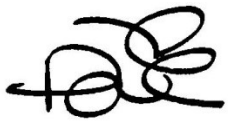
Conclusion

The Older Adult Plan for Recreation responds to themes of: population growth; changing demographics; older adult programming; effective service delivery; allocation of indoor space; and future older adult facility design and space needs in Mississauga.

Recommendations provide important direction for the Recreation Division and help focus resources and service planning.

Attachments

Appendix 1: 2019 Older Adult Plan for Recreation



Paul Mitcham, P. Eng, MBA, Commissioner of Community Services

Prepared by: Rachel Fraser, Business Advisor, Business Planning

Older Adult Plan for Recreation

Final I 2019

MISSISSAUGA

Monteith Brown planning consultants

tra. TUCKER-REID & ASSOCIATES

MISSISSAUGA

City of Mississauga

Older Adult Plan for Recreation

FINAL

Submitted:
June 26, 2019

Prepared for:
Recreation Division, Community Services Department, City of Mississauga

Prepared by:

Monteith+Brown planning consultants

in association with

tra. TUCKER-REID & ASSOCIATES

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Table of Contents

Executive Summary

The Older Adult Plan for Recreation ("the Plan") examines the 2008 Older Adult Plan and identifies priorities needed to move forward over the next 10 years. The scope of the Plan is focused on the Recreation Division and its Community Development Unit. The Plan is focused upon the Recreation Division's program and service delivery practices specific to the older adult market segment. Assessments of recreational older adult space/facilities are included in the Review as space needs have been identified as a current access issue by the community driven older adult groups/providers.

The Plan's service assessments and associated recommendations are organized into four overarching themes:

1. **Older Adult Service Delivery**
2. **Older Adult Programming**
3. **Allocation of Indoor Space for Older Adults**
4. **Future Older Adult Facility Design and Space Needs**

Recommendations arising from the Older Adult Recreation Plan are as follows.

Older Adult Service Delivery

1. Align all Older Adult Clubs and providers to the Community Group Registry Policy and revise the policy to provide clarity on program offerings and delivery.

2. Continue the work of the Older Adult Advisory Panel and other key older adult group stakeholders to assist with the implementation of the Older Adult Plan for Recreation.

3. Review operating model and space needs with Mississauga Seniors Centre membership.

4. Review the use of Older Adult Club/provider donations and Seniors Active Living Centres (SALC) grant funds to ensure a streamlined implementation in compliance with the Community Group Registry Policy recommendations.

5. Ensure the Recreation Division has the organizational structure to support the delivery of current and future older adult committees, programs, activities, processes and services.

6. Provide relevant training to all staff and volunteer executives serving older adults about legislative and quality assurance methodologies and implement a quality assurance program for City of Mississauga Older Adult recreation services provision.

Older Adults Programming

7. The age definition of an older adult engaged in recreation programs and opportunities should be confirmed as being 55 years of age and above. This age definition should be consistently applied to all programs, policies and services administered throughout the Recreation Division.

8. Enhance inclusiveness and social connectedness through program delivery targeted to persons 55 years of age and over:
   a. Leverage sponsorship/grants (i.e. investigate opportunity to offer low to no cost activities through sponsorship).
   b. Ensure a balance of programs is being offered in conjunction with Older Adult Clubs/providers that are of interest to a variety of older adult populations (including but not limited to newcomers, indigenous persons, LGBTQ+ community, isolated seniors and diverse/marginalized groups).

9. Work with community partners to better understand the penetration rate of older adults using recreation and related services in Mississauga, and to work collectively to respond to emerging trends and issues.

Allocation of Indoor Space for Older Adults

10. Review and revise the Master Scheduling Plan for Rooms and Program Spaces with all stakeholders involved (considering factors such as equity, demand, participation, preferences, ability, demographics, socio-economics, etc.).

11. Quantify demands and move the appropriate rentals and facility uses from community centres with pent up space demands to facilities with lower utilization within a given planning area, including relocation of City staff utilization (e.g. meetings, training, etc.). In doing so, the City should continue to work to accommodate summer-use requirements for older adults through the use of freed up space at facilities, utilization of facilities with capacity and the use of local and minor community centres.

Future Older Adult Facility Design and Space Needs

12. In order to optimize recreation facility space, future additions to the supply of spaces supportive of older adult recreation programming and services should come in the form of shared and/or integrated spaces within community centres rather than a stand-alone centre dedicated exclusively to older adults. At centres that are not being redeveloped, unique spaces for Older Adult use will be incorporated as appropriate.

13. Update design standards for recreation facility development/redevelopment projects to reflect the needs of older adults through elements such as (but not limited to) comfort, accessibility, and socio-demographic needs.

14. As accessibility will be a fundamental influence in design, a coordinated approach with transportation services including MiWay, accessible parking locations, drop off lanes to offer transit to (or as close as possible to) the front door of community centres should be undertaken at the time when community centres are designed and/or redeveloped.

15. Upon opening of the Churchill Meadows Community Centre, undertake the following strategies:
    a. Leverage the considerable addition of program space (including the 1,700+ weekday daytime hours) that will be available through the new Churchill Meadows Community Centre for the delivery of older adult programs and services, as part of its broader intergenerational programming/rental complement.
    b. Transition programs from the Churchill Meadows Activity Centre & Library to the new Churchill Meadows Community Centre, once opened, and dedicate the available space – estimated to be in the range of 2,000 daytime hours throughout the year – at the former to be allocated towards older adult programs and services.

1.0 Introduction

1.1 Purpose

Since 2008, the Mississauga Older Adult Plan has provided guidance to the City and identified a number of initiatives spanning multiple Departments and Divisions. With its implementation over the past decade, the City has made much progress in addressing needs and priorities that were contained in the Older Adult Plan. The current 2019 Future Directions cycle offered an opportunity to review the Older Adult Plan to align with current frameworks such as Future Directions, the Framework for Recreation in Canada, and others that have been developed over the past 10 years.

> "We need to change our thinking about people in the over-sixty age group, in radical ways. Longevity has advanced to the point where conditions like old age and frailty can no longer be defined by numerical age. Past stereotypes developed in past centuries no longer hold. When a 100-year-old man finishes a marathon, as happened last year, we know that conventional conceptions of old age must change."
>
> ~ Dr. Margaret Chan, Director-General, World Health Organization
> Opening remarks on World Health Day, April 4, 2012.

This Older Adult Plan for Recreation (the "Plan") examines the 2008 Older Adult Plan and identifies priorities needed to move forward over the next 10 years. The scope of the Plan is focused on the Recreation Division and its Community Development Unit. By identifying relevant issues for older adults, the Plan will support the Recreation Division's decision-making as how best to address the needs of Mississauga's older adults through the delivery of programs and services, coordination with other City Departments and Divisions, and supports for self-governing older adult groups and related community stakeholders.

Within the scope of work defined in the City of Mississauga's Terms of Reference are:

- Assessment of the Recreation Division's role in delivering older adult programs and services;
- Scan of relevant policies, frameworks, legislation, and best practices to highlight themes, issues and opportunities for the Recreation Division;
- Identification of trends and methods to broaden the older adult customer base;
- Incorporation of principles, priorities and actions of the Framework for Recreation in Canada;
- Community engagement through an online survey, focus groups, and staff workshops;
- Identification of strategic goals, action items and funding priorities;
- Consideration of, and response to, long-term needs of older adult program service delivery partners and community organizations; and
- Recommendations on key focus areas for the Recreation Division in terms of programs, services and space.

1.2 Strategic Framework for the Plan

The City of Mississauga's Recreation Division Vision and Mission statements provide a focused and coordinated approach to help meet its recreation goals. The Older Adult Plan for Recreation is aligned with the Divisional Vision with the recognition that many agencies, clubs, organizations, volunteers and the City work together to make an increase in participation come to a reality.

Vision

More people, connected more often, through programs and services that reflect our communities' needs

Mission

The Recreation Division's mission statement speaks to who it is, who it serves, for what purpose, and how the Division goes about its work. The desired objective for both the Vision and Mission statements in relation to the Plan is to inspire all older adults to be active every day.

"We keep Mississauga residents healthy, active and connected in partnership with the community."

1.3 Methodology

The Plan was initiated in April 2018 and is guided by a Terms of Reference overseen by a team of City Staff in conjunction with Monteith Brown Planning Consultants and Tucker-Reid & Associates. The planning process has employed a background review of relevant national and provincial frameworks, a scan of promising practices in other jurisdictions, and consultations undertaken with Mississauga older adults through workshops and a survey. The Plan benefitted from selected reports that were prepared by the City of Mississauga as well as utilization data provided through the Recreation Division.

The Plan is focused upon the Recreation Division's program and service delivery practices specific to the older adult market segment. Assessments of recreational older adult space/facilities are included in the Plan as space needs have been identified as a current access issue by the community driven older adult groups. These are also relevant and have been recently examined through documents such as the City of Mississauga Recreation Indoor Facility Infrastructure Strategy (2017) and 2019 Future Directions for Recreation.

The Older Adult Plan for Recreation considers other key municipal documents such as the Older Adult Plan (2008), Older Adult Recreation Spaces and Services Plan (2016 – draft), Age-Friendly Community Grant Report and Baseline Assessment (2017), Market Assessment and Socio-Demographic Study (2018), and Mississauga's Future Directions for Recreation Master Plans (2014 & 2019). The Study benefits from utilization data provided through the City's Recreation Division.

1.4 Summary of 2008 Mississauga Older Adult Plan & City Achievements

2008 Mississauga Older Adult Plan

The 2008 Mississauga Older Adult Plan was originally guided by 10 overarching principles, each of which contained a set of between two and four goals. These guiding principles and goals were used in conjunction with a vision statement to form the Older Adult Plan's foundation and recommended actions, the latter of which were developed to reflect the directions, priorities and values of Mississauga residents at that time.

> "As an age friendly city, older adults in Mississauga will lead purposeful and active lives, will live in their community with dignity, integrity and independence, and will experience a diverse range of lifestyle opportunities to pursue their personal interests."
>
> ~Mississauga Older Adult Plan Vision

To aid the City with implementation of the Older Adult Plan, the recommended actions were subdivided into six Action Plan topics. The topics and associated recommendations were thoughtfully curated and categorized based on demographic analysis, public consultation, trends research, best practices analysis, and inventory review; not unlike the works undertaken to develop this Plan.

The 2008 Mississauga Older Adult Plan was developed for the entire Corporation of the City of Mississauga and not solely the Recreation Division. As a result, some of the recommended actions are not directly applicable within the scope of this Plan; however, they provide context for what was important to older residents at that time.

City Achievements

To highlight some of the Recreation Division's success in implementing the 2008 Older Adult Plan, key recommendations for each of the six Action Plan topics have been described below as they pertain to the Division. These are not intended to constitute a complete summary of implementation progress for all of the Older Adult Plan's 66 recommendations but rather is a snapshot of actions pertinent to recreation.

A. Organization & Management

- The City of Mississauga formed an Older Adult Advisory Panel in 2014. The panel is responsible for assisting staff with implementing the Older Adult Plan, becoming an age-friendly city, as well as providing feedback regarding older adult services and programs, thereby fulfilling Recommendation **A-1.**
- To support the Plan's implementation and foster ongoing support of municipal Older Adult programs and services, the full-time position of "Community Development Coordinator, Older Adult Division" has been created, thereby fulfilling Recommendation **A-4**.

B. Subsidies

- Mississauga's "Active Assist" program offers subsidies to residents (regardless of age or ability) with demonstrated low-income. Discounted rates for recreation memberships are also available for Older Adults, thereby addressing Recommendation **B-1**.

C. Policies, Procedures & Guidelines

- The City continues to work with local transit authorities to ensure that major transit nodes are situated in close proximity to community facilities (e.g., community centres, libraries, high schools, arenas, etc.) and are located at controlled intersections wherever possible, in line with Recommendation **C-8**.

D. Collaboration & Partnerships

- The City of Mississauga provides a wide variety of educational courses geared towards older adults through internal instruction as well as partnerships with external community groups and agencies, in accordance with Recommendation **D-4**.

E. Marketing & Communications

- The content provided on the City's Older Adult webpage has been built to be accessible and designed in accordance with Age-Friendly dimensions, thereby fulfilling recommendation **E-1**.
- The City's current iteration of an Older Adult Guide is titled "active+" and provides information on programming, community organizations, access to transit and subsidies as well as emergency planning recommendations and others, in line with Recommendation **E-2**.

F. Older Adult Programs, Services & Facilities

- Dedicated Older Adult spaces available at City-owned and operated facilities as well as other non-municipal services providers are promoted through the Mississauga Oder Adult's webpage. Some of these include City Community Centres, Libraries, the Mississauga Seniors' Centre, and the Active Adult Centre of Mississauga, thereby addressing Recommendation **F-4**.
- Although an updated interpretation of the original recommendation, the City provides a variety of programming for Older Adults. No longer categorized only by age cohorts, a multitude of recreation programs are available to serve Older Adults based on interest and ability, thereby fulfilling Recommendation **F-6**.

G. Community Group Policy

- The Community Group Registry Policy benefits non-profit community groups by providing free use of rooms for meetings and annual general meetings, promotional opportunities, reduced rental rates and free use of space during non-prime time, the assistance of a staff liaison amongst others.

2.0 Foundation of the Older Adult Plan for Recreation

2.1 Overview

There are a number of factors influencing the planning context for this Plan. While other sections of this report articulate many of these factors, this Section focuses upon three primary areas being population growth expected in the City, continued aging of the population, and implications of future developments in areas of infill and intensification.

2.2 Alignment with Framework for Recreation in Canada

The City of Mississauga's Terms of Reference for this Older Adult Plan for Recreation specifies the need to "incorporate the principles, priorities and actions of the Framework for Recreation in Canada into the Older Adult Plan."

The direction from the City to consider the respective goals of the Framework for Recreation in Canada (FRC) and articulate the emerging issues as identified through the consultation phase of the Plan. The FRC is built on Canada-wide public consultation, national and international research and is grounded in experiences and data generated at the community, provincial/territorial and national level.

Recreation provides multiple pathways to wellbeing for individuals and communities, partly through access to built and natural environments. The FRC rejuvenates the definition of recreation and parks, articulates their economic impacts including the benefits, key goals and strategies that should be evident in each community across Canada. Recreation has the potential to address challenges and troubling social issues such as increases in sedentary living and obesity, and inequities that limit recreation opportunities for some population groups.

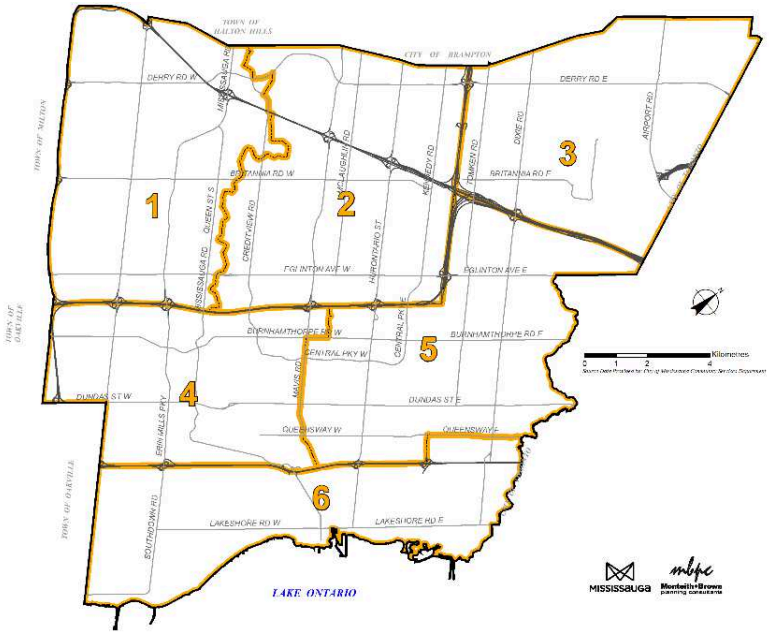
This renewed focus provides the rationale for investing in an evolved recreation strategy, and describes the need for collaboration with other initiatives in a variety of sectors. The FRC provides a new vision for recreation and suggests some common ways of thinking about the renewal of recreation, based on clear goals and underlying values.

Three key messages emerged during the development of the FRC which have and will stand the test of changing demographics and environments in Canada and aptly address a quality approach for the provision of recreation opportunities for older adults in Mississauga.

- High quality, accessible recreation opportunities are integral to a well-functioning society;
- The recreation sector can be a collaborative leader in addressing major issues of the day; and
- All people and communities deserve equitable access to recreational experiences. Recreation must be accessible and welcoming to all.

2.3 Mississauga's Older Adult Population

According to 2016 Census, there were nearly 11 million older adults across Canada who are 55 years of age and over, representing 30 per cent of the country's population. Mississauga had almost 200,000 persons in this age group in 2016 that accounted for 27 per cent of the City's population.[1]



The most recent age structure forecast available through the City counts more than 207,000 older adults in Mississauga that are 55+ (that forecast includes net Census undercoverage).[2] It is important to note that the population estimates referenced through these forecasts have not been updated to align with the City's most recent set of growth projections that have been prepared as part of the ongoing Development Charges Study review. However, these remain the best source of age-specific population estimates available at the time of writing and are thus used for the purposes of this Plan.

The age structure forecasts project a significant increase in City's older adult population, amounting to 93,400 more persons (+45 per cent) by the year 2031. The older adult population is expected to continue its upward trend after 2031 to reach over 320,000 persons by the year 2041.

Table 1: Projected Population of Older Adults in Mississauga, 2016-2041

Age Group	2016	2031	2041	Δ 2016-2031	Δ 2031-2041
55-64 years	103,240	100,870	88,120	-2,370 (-2%)	-12,750 (-13%)
65-74 years	61,560	110,360	95,690	48,800 (+79%)	-14,670 (-13%)
75+ years	42,750	89,740	138,530	46,990 (+110%)	48,790 (+54%)
Older Adult Total	**207,550**	**300,970**	**322,340**	**93,420 (+45%)**	**21,370 (+7%)**

Source: City of Mississauga, Planning Strategies Division. Mississauga Age Structure Forecasts 2011-2041

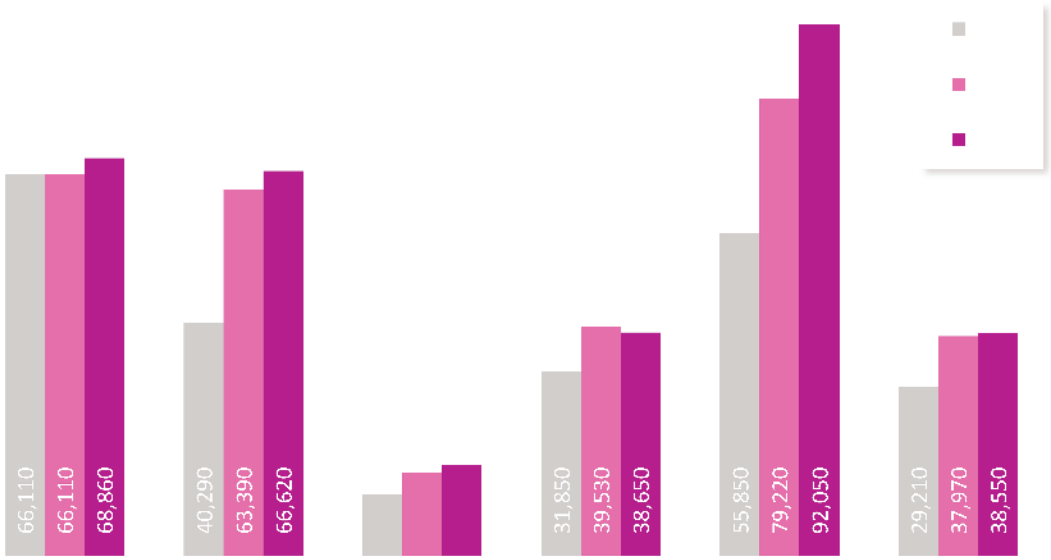
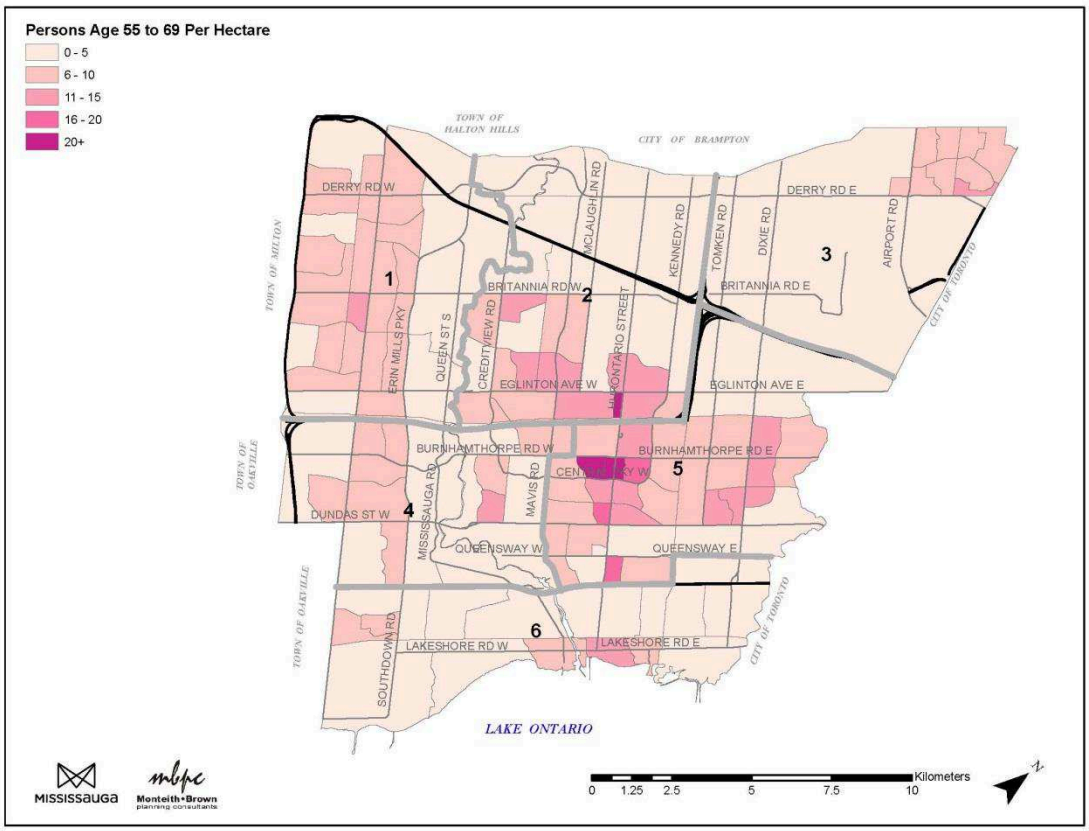

66,110
66,110
68,860
40,290
63,390
66,620
31,850
39,530
38,650
55,850
79,220
92,050
29,210
37,970
38,550

Figure 2: Population Density of Older Adults by Census Tract, 2016



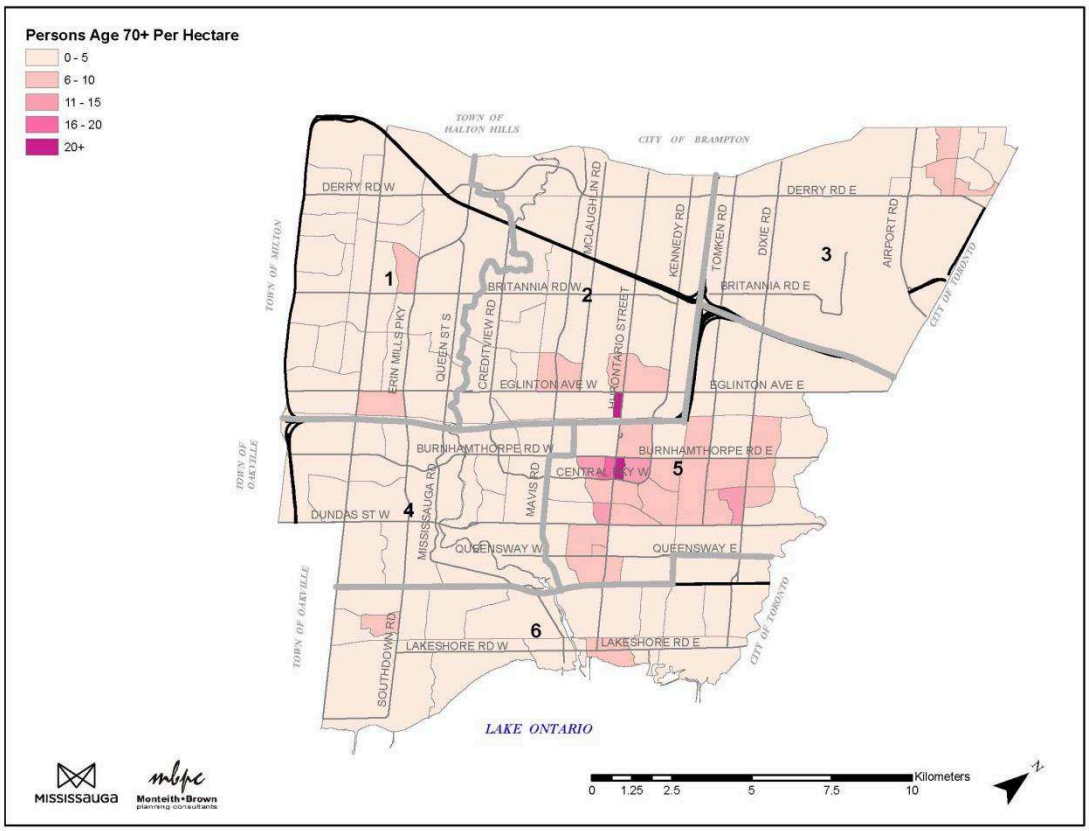
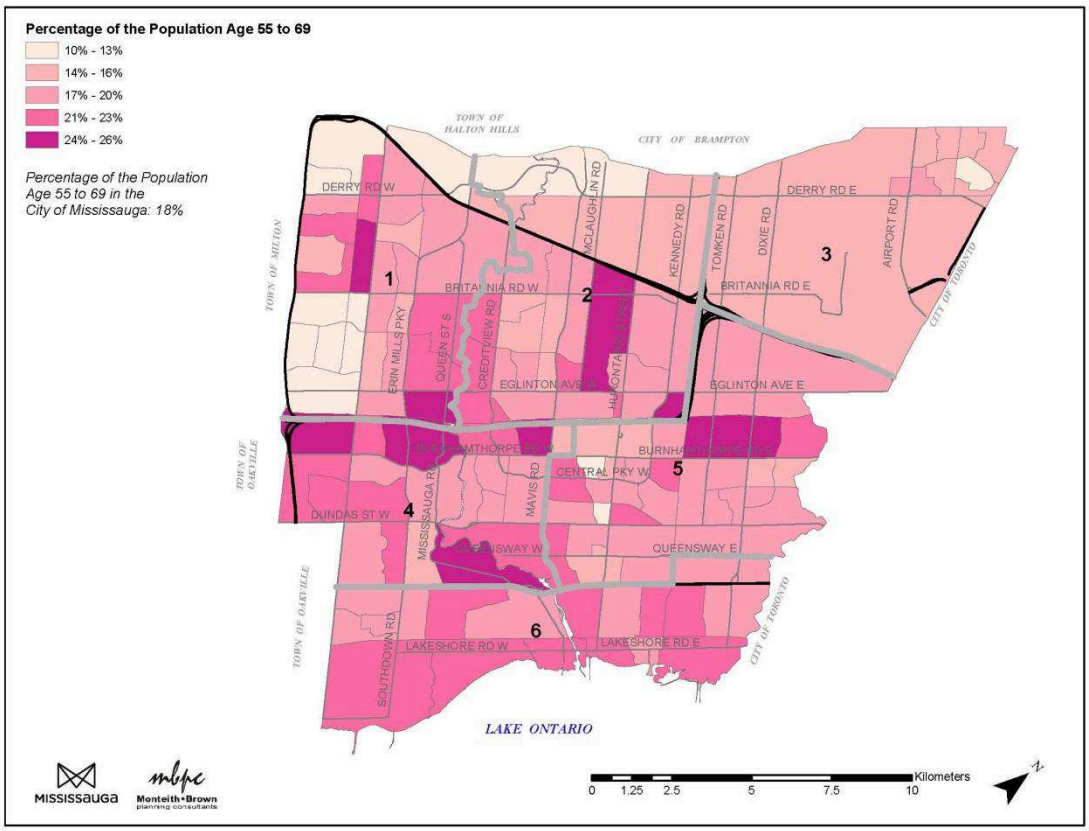
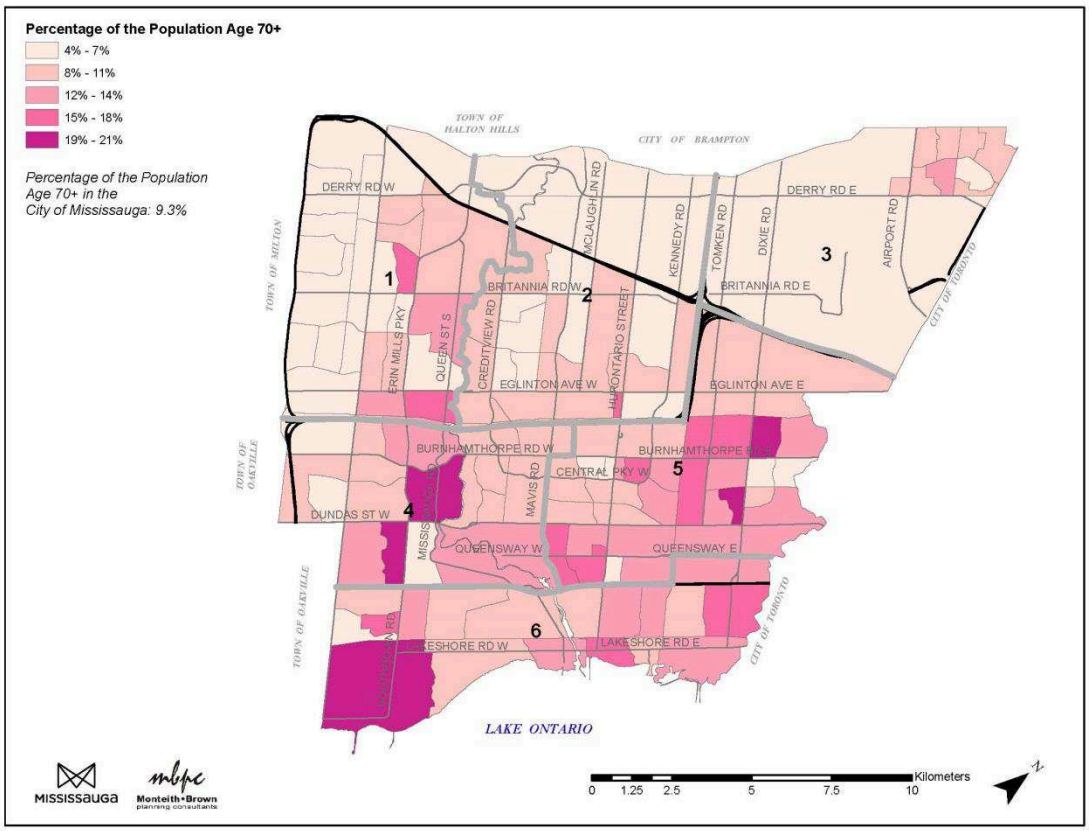


Figure 3: Older Adults as a Percentage of the Census Tract Population, 2016





The substantial growth in the City's older adult population across different areas of Mississauga will continue to create pressures for aquatics, fitness, and other recreational programs ranging from high-impact to therapeutic opportunities. Changing cultural characteristics, income levels and the number of able-bodied and disabled older adults will shape the way in which facilities and programs are designed and delivered.

2.4 Selected Trends in Recreational Services for Older Adults

Effective planning for the City's current and future older adult residents requires the identification, understanding, and continual monitoring of existing/emerging trends that could potentially affect needs. The following pages summarize major trends in participation, emerging activities, and service delivery, based on information collected from recent provincial and national research, as well as work undertaken by the Consulting Team in a variety of communities.

Social and Economic Influences on Health and Recreation

Multiple factors influence personal and public health, some of which are within an individual's control and others that are not. These determinants broadly describe the personal, economic, social, and environmental factors that influence overall health. The Public Health Agency of Canada has identified a collection of health determinants[3] including:

- Income and social status
- Physical environments
- Employment and working conditions
- Gender
- Education and literacy
- Healthy behaviours
- Social supports and coping skills
- Culture
- Childhood experiences
- Access to health services
- Biology and genetic endowments

This concept of health determinants is commonly explained using a socio-ecological model that considers five spheres of influence, all of which influence older adults' ability to participate in recreation and should be considered when planning and providing for these populations:

1) Intrapersonal (factors within an individual's control);
2) Interpersonal (factors dependent on family, friends, peers, support workers, etc.);
3) Organizational (considers factors such as access to and availability of health care, professional organizations, etc.);
4) Community (influence of workplace, school, community organizations, media, research, etc.); and
5) Policy (global and local trends, laws and policies, professional supports and recommendations). [4]

As a result of recent societal shifts, there is greater demand and expectation from the public for seamless services and support from municipalities, agencies, and other levels of government. This has generated a blurring of lines of responsibility, particularly in multi-use community centre settings. The Recreation Division falls within the scope of Community Services Department, which some members of the public may perceive as social services. For the purpose of this Plan, the recommendations focus directly on the Recreation Division. Key recreation, social and economic trends impacting the lives of Mississauga's older adults have been outlined in the tables below. The trends have been divided recognizing that older adults' ability to participate in, be aware of, afford, and travel to recreation opportunities is significantly influenced by their social, health and economic circumstance[5]. While these trends do not all focus on recreation specifically, they help to illustrate the issues impacting older adult access to recreation services, programs and facilities.

Recreation Trends Affecting Older Adults

Trend	Local Context
Older Adults are a **growing market** to which recreation services will need to be provided	• As the Baby Boomers move into retirement-age, there is a greater demand for older adult recreation opportunities. • These populations are seeking activities in the form of programs, events, and drop-in/casual recreation. Additionally, they are increasingly in search of prime-time facility-use, a shift from previous models focused on daytime programming for retirees.
Today's older adults are interested in **healthy and active aging.** They are healthier and more affluent than their predecessors and are seeking recreational opportunities[6].	• Support for healthy and active aging is growing throughout Ontario, Canada and the World. Recommendations stemming from the World Health Organization, Public Health Agency of Canada, and local/regional health units emphasize the importance of engaging in regular physical activity. • Older adult focused health and wellness programs focus on endurance, strength, balance and flexibility. Some examples of these programs include: mall-walking, gentle or chair fitness and aquafit. • Some focus group participants indicated that these programs should not be limited by age, but rather ability, as many are willing and able to participate in higher-intensity or competitive activities. • Statistics Canada's 2016 Survey of Financial Security finds households with earners between the ages of 55 and 64 have the highest net worth among all age groups followed by those 65 years and over. It also reported that seniors 65+ are most likely to have no debt (58%) though less are debt-free compared to 20 years prior.
Social connections are an important component of health and well-being. This is a growing focus of recreation programs and events.	• Older adults are seeking a public space to participate in casual opportunities for social interaction. • These interactions may take the form of: card games (e.g., euchre, bridge, hearts, etc.); coffee talks; day trips/outings to local or regional destinations; and book clubs, etc. • Social interaction and mental stimulation have been proven to help maintain cognitive function with age and limit the effects of disease.
Skill Development and Continuing Education	• Seeking continuous learning opportunities, especially post-retirement • Many taking on second careers or part time employment
Adult recreational pursuits can also foster a strong **arts and cultural community.**	• Many focus group attendees indicated a desire to participate in more arts and cultural programming and activities. • Some of the interests expressed included: music; fine arts; theatre; photography; and crafts / do it yourself workshops.
Technology is a growing facet of recreation. It is used for communication, registration, and sometimes required for participation. Many older adults are willing and interested in learning about new technologies and services but require guidance to hone these skills.	• In recent years, Recreation Services have shifted to a digital-focus and are less-reliant on print-media and communications. As a result, some older adults struggle to keep up with the ever-changing world of technology. • While technology offers many accessible features; it can also present a barrier to some older adults, particularly those with dexterity issues, vision loss, declining cognitive function, or other degenerative conditions. Technology should not be entirely relied upon to keep older adults informed of, or active in, recreational pursuits.

Older Adult Social Trends

Trend	Local Context
Each of the **under-represented and marginalized populations** described here (column to right) and countless others are faced with critical issues and are often lacking essentials (i.e., food, shelter, etc.), therefore decreasing their focus on recreation and decreasing participation rates.	• **Homelessness** is a growing concern in Mississauga and Peel Region. According to United Way Peel more than 222,000 struggle to afford housing across Brampton, Caledon and Mississauga. • **Newcomers and cultural groups** represented in focus groups identified a strong desire to participate in culturally-focused programs and activities. According to the 2016 Census, 53.4% of Mississauga's population are immigrants and 14% of those arrived in the past 5 years. One in ten immigrants in Mississauga are over 45 years old. • **LQBTQ+** populations often share that they feel uncomfortable or like they don't belong in shared public spaces such as community centres. It is important to demonstrate authentic engagement with these populations and provide inclusive programs and facilities[7].
Healthy Community Objectives are a key focus for government, institution, and research-based bodies. This also includes a multi-service/function **community-hub model** for services.	• Public Health Agencies and Health Researchers promote the benefits of: health promotion/education, injury prevention, healthy community design, partnerships with hospitals, rehabilitation programs, etc. • An example of this in Mississauga is therapeutic recreation programs. The City's partnership with the Heart and Stroke Foundation offering aquatic programs (Stroke Breakers) specifically designed for those at risk for and who have suffered from strokes and heart disease.
Mental Health has been a dominant focus of recent work by researchers, agencies, organizations and government bodies committed to public health and welfare (i.e., ParticipACTION Report Card, Mental Health Commission of Canada, etc.).	• Self-reported physical and mental health rates were high (91.8%), the percentage of Mississauga residents who rated their mental health as excellent, very good, or good has decreased 4.2% since 2009/2010[8]. • According to the Canadian Mental Health Association, common health disorders in older adults include depression, suicide, anxiety disorders, dementia, delusional disorders, delirium, paraphrenia, and concurrent disorders[9]. Research has shown that participation in social and recreational activities can help reduce or prevent many of these.
Income Disparity is a phenomenon polarizing communities in the GTA and throughout Canada. The inequality of affordances greatly impacts older adults' ability to recreate.	• The percentage of low and very-low income individuals in Peel Region has been growing since 1970; from almost 0% to more than 50% in 2015[10]. This indicates that there may be gaps in services, distribution, affordability, transportation, program delivery for populations depending on their ability to afford recreation. • The percentage of Mississauga seniors (65+ years) living on low income is 11.8%, an increase of 3.3% since 2010.
Ageism was described by many focus group participants as a frustration when seeking recreation opportunities.	• According to contributors, social construct of life course in society generally categorizes people in later stages of life as "old", "frail", or lacking functional ability. Many focus group participants indicated a desire to be recognized individually, rather than as a group assuming similar interests and abilities based on age.
Accessibility in many forms (e.g., information, economic, geographic) is a concern for many older adults.	• Programs, services and facilities for older adults need to consider accessibility for all. This includes ensuring: physical spaces are barrier free; equitable distribution of programs and services throughout the municipality; consideration of access via assisted and public transit; affordability regarding cost, time, and equipment; information sharing and service promotion; and the ability to deal with inclement weather.

2.5 Summary of Consultations

A series of consultations were undertaken between June and July 2018 to inform the Older Adult Plan for Recreation. Consultations included:

- A survey of Mississauga adults and older adults ages of 45 and over, resulting in 420 responses;
- A workshop with the Mississauga Older Adult Advisory Panel;
- Two workshops with members of Community Centre Older Adult Committees, including one focused on the Malton community;
- Two agency and partner focus groups, one with older adult-serving agencies operating in Mississauga and another with newcomer agencies;
- Two workshops with management staff in the Recreation Division as well as program staff from various recreation units; and
- Two workshops with staff from various City of Mississauga departments whose responsibilities pertain to older adult services.

Each in-person workshop/focus group was scheduled for 60-90 minutes with discussion guides provided to attendees in advance to facilitate conversation around recreation services for older adults. For non-staff sessions, incentives were provided in the form of recreation passes and MiWay fares.

The pages that follow summarize the key themes from each consultation initiative. See Appendices for detailed reporting on the outcomes of each consultation initiative.

Older Adult Survey

A total of 420 surveys were received, just over half of whom reported being members of an Older Adult Club affiliated with the City or operating out of a municipal community centre. The following points of note emerged through the survey:

- The vast majority (87 per cent) agree with the City of Mississauga's current definition of an "older adult" which encompasses persons 55 years of age and over;
- Over half of respondents participate in social or physical activities most often at a multi-use community centres, while one in four participate most often at home, and one in six participate most often at a library branch or the Mississauga Seniors Centre.
- Nearly 70 per cent envision themselves using a multi-use community centre in five years' time while less than half (47 per cent) expect to use the Mississauga Seniors Centre.
- One in three survey respondents are volunteers, spending an average of 6.4 hours per month volunteering; 36 per cent identified the likelihood of themselves volunteering in five years as very likely.
- Less than half describe their current physical activity level as "low intensity" or "medium intensity", and 8 per cent reported participating in "high intensity" physical activity.

Older Adult Advisory Panel Workshop

Considerable discussion centred upon who and what constitutes an older adult, and the perceptions/stereotypes that older adults face from other age groups. The Panel emphasized ability more so than age, but noting there is no one categorization or label to define an older adult. Panel members indicated that municipal programming should continue to be developed around interest and ability rather than emphasizing an age. Transportation remains one of the most significant barriers and suggesting a hope that the City will continue expanding program opportunities for older adults throughout Mississauga.

Panel members were adamant that communication is key to successful promotion and programming. They indicated that word of mouth remains the most reliable form of information sharing as there continues to be a generational and cultural divide among participants; some older adults are very tech-savvy while others prefer verbal interaction, while others may experience language barriers.

Community Centre Older Adult Committee Workshops

Common themes expressed during the Community Centre Older Adult Committee (CCOAC) workshops included the identification of transportation barriers and lack of awareness as preventing some older adults from accessing recreation opportunities, support for the club-based environments found in the multi-use community centres, and a desire to share knowledge with younger generations (including teens). There were also suggestions for universal access programs and opportunities provided at no cost to low cost to the participant.

Many CCOACs reported growth in their memberships which they view as a positive but also presented challenges in their ability to accommodate everybody. They encouraged the City to facilitate more opportunities for older adults to be directly involved in the recreation system through volunteering, coordinating, and assisting with awareness/promotion.

Agency Focus Groups

Agencies and partners emphasized the role of recreation – in conjunction with their respective service – to reduce social isolation among older adults, particularly among newcomers, marginalized populations and other isolated groups. Finding ways to encourage greater participation among all older adults was stressed throughout the discussions with suggestions such as reaching out through faith-based organizations, community leaders, and translate publications and resources. Attendees also noted that indoor meeting and gathering spaces are in high demand and difficult to come by, particularly in the summer when municipal camps make use of the City's facilities.

City Staff Workshops

City staff with recreation and non-recreation responsibilities were engaged. Common topics of discussion centred upon barriers (income, transportation, accessibility), ways in which the Plan could assist Staff in their day-to-day and long-term tasks, and how older adult programs could be promoted more effectively.

Older Adult Feedback Sessions

City staff hosted ten Older Adult Feedback Sessions presenting the draft recommendations, ensuring that each community was afforded the opportunity to be well represented without being faced with travel limitations. In total 384 Older Adults were engaged. Please see Appendix E for a detailed review of the meetings and survey synopsis.

3.0 Older Adults Service Delivery

3.1 Overview

The City of Mississauga Recreation Division supports a strong network of older adult clubs/providers, operates the Mississauga Seniors Centre, and offers many programs and services that are utilized by the older adult population. The relationship with the older adult clubs/providers is fostered to ensure that all older adults are welcomed and included in activities of their choice. Each community centre has an advisory committee that coordinates the sharing of space with all the older adult groups/providers operating out of that centre. The role of City staff is to ensure that the clubs/providers can operate independently, meet their own mandate and be provided the space, equipment and room set ups that they require. Assistance is provided on a consistent basis with respect to governance, legislative changes, available grants, and ensuring that there are constant communications in and amongst the clubs/providers.

The Recreation Division has adopted a model that works in a diverse community where the population is aging; there are many ethno-cultural clubs/providers that serve a specific population while others appeal to all residents. The Division has sought out sponsors to better address special events and projects. The City supports the Older Adult Advisory Panel which is represented by a diverse membership and whose mandate it is to achieve Age-Friendly Community status. Together, the Older Adult Advisory Panel, older adult club representatives, and City staff have a strong relationship where they plan to ensure that Mississauga is age friendly and addresses changes as different trends and service provision issues present themselves.

3.2 Observations from Research & Consultations

Selected observations uncovered through research and consultations included the following:

- **Integrated, City-Wide Memberships** - one of the commonly discussed opportunities was to employ a more holistic approach to service delivery by reviewing the membership passes offered by the City of Mississauga. Program staff indicated that residents frequently ask why the passes cannot be used City-wide and have difficulty understanding the various membership types (e.g., therapeutic). Program staff suggested that memberships should be applicable across the City.

- **Priority Neighbourhoods** - program staff involved in the consultations indicated that greater investments should be made in older adults in priority neighbourhoods and that programs and services should be distributed to reflect the needs of the various demographic pockets identified within Mississauga. The thinking behind the suggestion is that older adults with higher incomes are most likely to afford transportation, can access private recreation opportunities, and are able to navigate themselves more readily.

- **Improving City-Wide Mobility** - the upcoming Transportation Master Plan will focus on providing transportation options (cycling, walking, and transit) for people aged eight to 80+,

rather than focusing specifically on "older adult" transportation needs. MiWay offers $1 bus rides after 9:30 AM for older adults while the Transportation Department is working with the Planning Department to support walkable neighbourhoods.

- **Communicating with Older Adults** - in responding to a question in the public survey about how best to communicate with older adults the following suggestions were made; email (52 per cent), Active Mississauga Guide – online (47 per cent), and Mississauga Active+ Guide through recreation (41 per cent). Other commonly noted ways to inform participants of programs and services were: City of Mississauga website (28 per cent), Older Adult Expo/open houses (27 per cent), and newsletters/mail (26 per cent). Of the 40 attendees at a meeting held at Malton Community Centre, just five volunteered that they had convenient access to computers, although limited in some cases. Participants felt that communications still needed to be paper based through newsletters, the Active+ Guide and postings at community centres. The group also indicated that they were not fully aware of what activities were available within all the groups at the Community Centre. Many agreed that inter-club activities would provide an opportunity to share access to all activities and develop better ways of working together.

- **Holistic, Integrated Plans** – staff workshops suggested that new plans should be City-wide plans, not just Recreation-based plans. Staff also suggested assigning a designated departmental contact for the Plans, so everyone knows who is responsible for implementation or who to inform about updates. Staff also highlighted the need for older adult engagement during planning processes.

3.3 Mississauga Older Adult Recreation Service Delivery

Service delivery within Mississauga's purview supports a full range of accessible recreation programs and services for older adults; it focuses on both direct delivery of programs and services as well as supporting a good number of older adult club/providers using City facilities. Plans, policies, practices, programs and services strive towards Mississauga being age friendly, and that all municipal programs and services are safe, embrace quality assurance standards and are welcoming. The service delivery approach includes Older Adult Groups/Providers operating out of multi-use community centres combined with directly offered programs and services by the City.

The City of Mississauga Older Adult Service Delivery Model includes:

- Older Adult Club/providers (47) operating out of multi-use community centres
- The Mississauga Senior's Centre
- Active Adult Centre of Mississauga
- City Offered Programs and Services (typically active opportunities)

3.4 Older Adult Clubs/Providers

Older Adult Clubs/Providers are managed by volunteers and are formed according to standard criteria regarding residency, governance, etc. Groups primarily utilize space in community centres. The Director of Recreation approves all applications to ensure consistency and groups are provided with daytime space at no cost, Monday through Friday, 8:30am to 4:30pm (excluding gymnasium spaces).

As of 2017, 47 affiliated Older Adult Groups were operating within Mississauga. There are certain inconsistencies in the way that older adult groups contribute towards the cost of programs/facilities that

they use; some groups direct a portion of their membership fees - to varying degrees - towards community centre costs whereas other clubs/providers do not contribute any financial resources.

Data compiled for the Future Directions 2019 Recreation Master Plan provided an overview of the participation and engagement of Older Adult Clubs/Providers from 2015 to 2017 and demonstrates the following:

- Both the number of self-governing Older Adult clubs/providers and their respective **membership** numbers decreased between 2015 and 2017. As a result of fewer clubs/providers and possibly some of their former members joining a different club, the average number of members per club/providers increased which has contributed towards a six per cent reduction in program attendance for the Older Adult Clubs/Providers (overall annual attendance decreased by 17,000 persons).

- There were **400 fewer volunteers** among the Older Adult Clubs/Providers, possibly a result of the decrease in their collective memberships but also reflective of broader trends in volunteerism where recruitment levels cannot keep pace to replace lost volunteers. The 40 per cent reduction in the volunteer force contributed towards 19 per cent fewer hours volunteered in the groups (a loss of 15,700 hours compared to 2015 levels).

- Despite declining memberships, program attendance and number of volunteers among the Older Adult Clubs/Providers, the number of **programs** that the Older Adult Clubs/Providers collectively offer remained stable. The sustainability of the recreation program provision model relies on the capacity, support, volunteerism and services provided by these groups.

- The approximate usage rate for both **drop in activities** and directly offered programs is 1.17 uses per older adult. If this rate of participation continues, the City can anticipate an additional 109,000 older adult resident uses in community centres by 2031 when the older adult population exceeds 300,000.

- Sustained emphasis is needed for the support that the City provides to Older Adult Clubs/Providers while continued monitoring of membership numbers and volunteers is required.

- Adults that are approaching the older adult stage (i.e. people presently in the 45 to 54 year category) are continuing to participate in activities of their choice regardless of whether delivered by a municipality or other providers. The preference seems to be casual use of facilities to meet their individual schedules (drop in swims, shinny, golf, etc.) but often participate in organized sports and activities as well.

- The older adult club environment may not be suitable for 45 to 55 year olds in the future. There may continue to be a decline in older adult club memberships and volunteerism as older adults continue to be more active but require the availability of programs and services that meet their individual lifestyle needs. Continued monitoring of participation patterns within older adult clubs/providers and by younger older adults is required.

Table 2: Older Adult Club Participation, 2015 – 2017

Older Adult Club Services	2015	2016	2017
Older Adult Groups	58	60	47
Membership Numbers	8,500	8,200	8,200
Average Members per Older Adult Group	147	137	174
Number of Volunteers	1,000	700	600
Number of Volunteer Hours	80,700	69,100	65,000
Value of Volunteerism at $15.00 Per Hour	$1,211,000	$1,036,400	$975,300
Number of Programs Offered by Older Adult Clubs/Providers	14,200	15,000	14,100
Attendance in Programs	292,600	288,500	275,600
Average Attendance Per Program	21	19	19

Source: City of Mississauga Future Directions 2019 Recreation Master Plan

3.5 Mississauga Seniors Centre

The Mississauga Seniors Centre is a City-owned facility offering programs and services to older adults over the age of 60 years. The Centre is jointly programmed by volunteers (Activity Leads) and 2 municipal staff who manage operations as well as the delivery of programs and services. The public can access the Centre at times when older adults are not utilizing the meeting rooms and other gathering spaces through the Room Rental process.

The Centre is a unique space as it is dedicated to the advancement of healthy and positive outcomes within the older adult population in Mississauga. It offers a wide range of choices including active, social, and technology-based learning, educational seminars as well as trips and refreshments for its 1,300 members. The Mississauga Seniors Centre is open 78 hours for most weeks based on its typical hours of operation:

- Monday through Friday: 8:00am to 10:00pm
- Saturday: 9:00am to 1:00pm
- Sunday: 1:00pm to 5:00pm

The Mississauga Seniors Centre demonstrates an effective relationship between its volunteers and the City of Mississauga. The volunteers are activity leaders who arrange and oversee weekly programs while the City offers a wide range of fitness, computers and active living programs to augment opportunities for program registrants. The annual membership fee of $26 plus HST per eligible Mississauga resident ($10.00 extra for non-residents) allows members to enjoy programs, social activities and special events and join the day trips.

Volunteer opportunities within the Mississauga Seniors Centre include activity leaders, office volunteers, special events organizers and the Fund Committee. The Mississauga Senior Centre Fund Committee develops fundraising opportunities, allocates funds to furnishings, equipment and special events and provides advice to Mississauga Seniors Centre staff. The Garden Café is run by a group of volunteers who provide nutritious meals in a friendly social setting and provide this services Monday through Friday from 9:00am to 1:00pm.

The Centre provides 462 hours of available community spaces throughout the course of the weekdays throughout the year. Older adults utilize the space generally during the weekdays and the community can utilize the space evenings and weekends. The analysis of the use of space demonstrates that the

centre spaces are utilized at 30 per cent of the time available throughout the year. A realistic target for the use of community space should aim to 70 per cent of the total available space.

Observations for the annual use of the Mississauga Seniors Centre are as follows:

- The rooms are utilized more frequently during the weekdays year-round including September to June and the summer months;
- Rooms are underutilized on evenings and weekends and allow for migration of uses where there are pent up demands;
- Mississauga Seniors Centre is used most frequently between 9:00am and 4:30pm daily which does coincide with typical older adult preferences regarding safety and comfort; and
- An average utilization rate of 30 per cent for the year leaves room for additional and more frequent uses.

Some rooms at the Mississauga Seniors Center are used more frequently than others:

- The most highly utilized rooms are the Lucy Turnbul, Olga Tyne, the Multi-Purpose and the Billiard room using an average of 60 per cent of the times that are available. Using a benchmark target of 70 per cent utilization, **each** room would need to be utilized on average 5 hours more each week from September to June.
- The rooms that are underutilized include the Craft Room, Seniors Library and the Legacy Lounge. These rooms are built for specific purposes and are thus not always conducive to a number of programs and activities spanning a broader range of interests. These rooms require rethinking and refurbishing to make them multi-purpose in nature to meet various activity needs. On average **each** of these rooms require 39 hours of use per week additional use to meet a 70 per cent utilization benchmark (Monday to Friday between September and June).
- In total, there are approximately 138 hours of additional use that the Mississauga Seniors Centre could accommodate weekly to achieve a 70 per cent benchmark target that denotes a well-utilized facility.

The growth in the adult population and the underutilization of the Mississauga Seniors Centre provides a unique opportunity to offer this centre as more of a destination for all older adults within Mississauga. This is not to suggest that any existing programs would be displaced but refurbishment and fuller utilization would provide the opportunity for older adults to be active more often as is the vision of the Recreation Division. The aging population will likely require more access to recreation facilities during evenings, weekends, and in the summer time; further, the need for a balance of dedicated and shared spaces within community centres can be expected to arise. The short-term opportunity is to better understand the pent-up demands and migrate uses to the Mississauga Seniors Centre where there is capacity. Other considerations must be addressed such as transportation and matching uses with the spaces available. The longer-term consideration is to refurbish underutilized spaces to ensure that they meet the need for varied uses.

The Future Directions 2019 Recreation Master Plan's recommendation to potentially integrate the Mississauga Seniors Centre within a reconstructed Carmen Corbasson Community Centre (with a new indoor pool) creates tremendous potential to boost older adult attendance and use. A strong ability would exist to cross-program the Mississauga Seniors Centre with a new pool and the existing gymnasium in the community centre, allows the new generation of older adults to still feel integrated in a multi-generational setting but offers a high-quality place of their own through a revamped Mississauga

Seniors Centre. As per the 2019 Recreation Master Plan and other previous studies, the City will be reviewing the operating model and space needs with members of the Mississauga Seniors Centre.

3.6 Active Adult Centre of Mississauga

The Active Adult Centre of Mississauga (AACM), formerly known as the Square One Older Adult Centre, was established in 1992. The AACM is a registered not-for-profit organization committed to enriching the lives of Mississauga's seniors and older adults who are 50+ years of age. Over 80 opportunities are offered on a weekly basis. Governance and oversight are provided through a volunteer board of directors. Over 180 volunteers work to plan, develop and offer programs and services to over 1500 members. The arrangement between the AACM and City is unique in that the City leases the space and has an operating agreement with the AACM; the investment by the City is substantial considering it contributed towards the renovation of the older adult space as well as through the operating agreement.

3.7 City Offered Programs and Services

The City of Mississauga offers classes and services for older adults in aquatics, fitness, general programs, therapeutic recreation, and registered and casual/drop in opportunities. The role of staff is to ensure that all older adults have access to programs and that programs are geographically distributed throughout the City, are safe, enjoyable and offer a level of quality assurance.

Programs are delivered in a number of multi-purpose rooms, gymnasiums, active living studios, meeting rooms, etc. that collectively amount to over 160,000 square feet of space across 13 locations throughout Mississauga. Additionally, program rooms are available at arenas and stand-alone halls (e.g. Meadowvale Hall, Erindale Hall, Clarke Hall, etc.).

3.8 Community Development Unit

The City values engagement from residents that are affected by service delivery and policy-related decisions. The Recreation Division encourages older adults to have a strong voice in the development and delivery of older adult recreation services through the Recreation Division's Community Development Unit, Community Centre Older Adult Committees and the Older Adult Advisory Panel.

The Community Development Team is a staff unit in Recreation Division that provides centralized policy and practice development and the allocation of funds through the Seniors Active Living Centre (SALC) grants. The Team also is responsible for administration along with continued communications and liaison with the Community Centre Older Adult Committees and the Older Adult Advisory Panel. This centralized role is pivotal in ensuring that City-wide issues affecting older adults in recreation are addressed equitably and through collaboration. Core elements of the Community Development Team include:

1. Community Group Registry Policy
2. Community Events
3. Grants Administration
4. Special Population Advocacy & Engagement
5. Inclusion
6. Community Partnerships

An example of an innovative partnership is the Amenity Space Agreement created with the Region of Peel at Creditvale Mills, a Region of Peel facility where the City of Mississauga oversees the booking of the 3,000 square feet of common space in return for 20 hours at no cost to the City. These hours have been assigned for older adult groups using a combination of prime time, evening and weekend hours. There are several community organizations, agencies, and private sector businesses that provide support, programming, or volunteer opportunities targeting the leisure interests of older adults.

3.9 Community Group Registry Policy

The Community Group Registry Policy provides benefits to non-profit community groups including Older Adult groups that meet residency and other organizational and administrative requirements. Benefits include free use of rooms for meetings and annual general meetings, promotional opportunities, reduced rental rates and free use of space during non-prime time, the assistance of a staff liaison amongst others. The City should continue to encourage Older Adult Clubs/Providers to register with the Community Group Registry Policy to maximize on the benefits the policy offers.

3.10 Volunteers

Volunteerism is critical to the success of older adult recreation in Mississauga. The City's delivery of services relies on volunteers to offer the wide range of activities offered by older adult groups. The use of volunteers reduces expenditures which contributes to the delivery of low-cost activities. The older adult groups also fundraise to buy equipment that support various activities. Further the role that the Older Adult Advisory Panel and the Community Centre Older Adult Committees play is critical to the success of the provision of space and services. Both groups look to capture City-wide responses to issues and the direct success of local recreation opportunities.

Older Adult Survey (see Section 2.5) respondents spent an average 6.4 hours volunteering each month, with 144 of them committing to one hour or more. More than one-in-three survey respondents (36 per cent) consider themselves very likely to serve as a volunteer in the community within the next five years. Another 22 per cent indicated they are somewhat likely to serve as volunteers within the next five years while the remaining 24 per cent indicated they are somewhat unlikely or very unlikely to serve as volunteers in the same timeframe. This is aligned with the City of Mississauga Older Adult Recreation Spaces and Services Plan and the Older Adult Plan that observes volunteerism for Older Adult clubs/providers is declining while needs are increasing due to the aging population, as well as current data from the City's Older Adult Clubs/Providers that shows a 40 per cent decline in their volunteer since 2015. The delivery of recreation services through older adult clubs/providers is an efficient way for the City to ensure that older adults are engaged and active, as there were approximately 36 full-time equivalent positions in volunteer hours in 2017. It is important to support this service delivery approach for as long as the model is attractive to older adults and sustainable through volunteers.

3.11 Community Centre Older Adult Committees

The Community Centre Older Adult Committee (CCOAC) is a forum where information and advice is exchanged between older adult groups and community centre staff. Members collectively plan, implement, promote, and evaluate processes and activities that strengthen efficiency and effectiveness in the coordination and collaboration of Older Adult groups within the centres. Community Centre Older Adult Committees meet regularly to discuss areas of common concern within community centres with

3.12 Older Adult Advisory Panel

3.13 Financial Impact and Monitoring

Older Adult discount and no cost meeting room space - A Pricing Study for Recreation Services was undertaken in 2011/2012 to determine the costs of providing services and to streamline fees in order to maintain appropriate levels of cost recovery. At that time, City Council approved a recommendation to offer all older adult drop-in fees, memberships and programs at a 20 per cent discount. Further, it was approved that the non-prime use of space would be provided at no cost for Older Adult affiliated groups; this policy continues to be in place at time of writing. The City, in line with public and private sector best practices, places a greater emphasis on subsidization based upon a person's ability to pay rather than solely upon age. The sheer growth in the 55+ population has the potential to diminish the financial sustainability of operating facilities if discounts are applied solely on the basis of age. This is not to say that age-specific subsidization should be eliminated altogether, but simply means that the City will need to evaluate its priorities over time to ensure that facilities and services continue to be delivered in a sustainable manner. The Active Assist Program is available to older adults in Mississauga and is promoted in the Mississauga Recreation Active+ Guide. With the revised definition of Older Adult as 55 years and older, the City should develop a strategy to incorporate the new age category in its discount structure. A review of current and future space needs for this age group, particularly regarding evening and weekend times should be analyzed and the current policy of allocating free space should be reviewed.

The Seniors Active Living Centres (SALC) grant offered by the Government of Ontario provides funding to enable the provision of programs and services to older adults by older adult clubs/providers, municipalities and not for profit groups. The City is eligible for, and receives annual funding to offset the cost of spaces for Older Adult club/providers. The grant also funds specific initiatives where the City and the Older Adult groups work together to purchase mutually beneficial equipment and invest in enhancing services for elders in Mississauga. The City should review the allocation of the SALC funds to maximize use for the Older Adult Clubs/Providers and City facilities.

3.14 Organizational Effectiveness

Ensuring organizational effectiveness in a public setting requires a thorough understanding and formalization of employee responsibilities including accountability measures. Some factors to consider include: equitable distribution of work; clear delineation of responsibilities; as well as accountability and transparency in all policies, communications and work efforts. The Community Development staff should review the following in the short term:

- Required support model for older adult clubs;
- Formation of support committee at the community centre level;
- Review required support for the Seniors Advisory Panel; and
- Other duties as required.

Each discipline has clear job descriptions and deliverables with respect to program provision as well as neighbourhood and community-wide supports; however, there is a need for staff units and other service providers to work better together. The departmental units require ongoing dialogue and the use of data to understand the changing demographics, utilization, participation rates within planning districts, current trends, and how their respective work contributes to an overall vision of increased participation of the Older Adult population. The successful implementation of the Plan requires an analysis of the Recreation Division's current organizational structure to confirm there are adequate supports in place to, provide the delivery of current and future older adult committees, programs, activities, processes and services.

3.15 Quality Assurance Methodologies

The City of Mississauga strives to enable recreation programs and services through direct and indirect programming models. Our residents should be able to anticipate an emphasis on quality assurance in service delivery. The Recreation Division must have standard policies and practices that will ensure legislative requirements are met (at a minimum) but also provide a level of assurance that customer service and quality standards are being met. All staff and volunteer executives serving older adults should be educated surrounding legislative and quality assurance practises and a quality assurance program for City of Mississauga Older Adult recreation services provision should be implemented.

3.16 Recommendations

Older Adult Service Delivery Recommendations

1. Align all Older Adult Clubs/Providers and providers to the Community Group Registry Policy and revise the policy to provide clarity on program offerings and delivery.
2. Continue the work of the Older Adult Advisory Panel and other key older adult group stakeholders to assist with the implementation of the Older Adult Plan for Recreation.
3. Review operating model and space needs with the Mississauga Seniors Centre membership.
4. Review the use of Older Adult Club/provider donations and Seniors Active Living Centres (SALC) grant funds to ensure a streamlined implementation in compliance with the Community Group Registry Policy recommendations.
5. Ensure the Recreation Division has the organizational structure to support the delivery of current and future older adult committees, programs, activities, processes and services.
6. Provide relevant training to all staff and volunteer executives serving older adults about legislative and quality assurance methodologies and implement a quality assurance program for City of Mississauga Older Adult recreation services provision.

[1] Statistics Canada Census of Canada. Figure is unadjusted for net undercoverage.

[2] City of Mississauga, Planning Strategies Division. 2016. Mississauga Age Structure Forecasts 2011-2041. Note: the Planning Strategies Division is presently reviewing these forecasts in light of ongoing conformity exercises with the Region of Peel's review of its growth forecasts/allocations.

[3] Public Health Agency of Canada. Social Determinants of Health and Health Inequalities. https://www.canada.ca/en/public-health accessed on October 3, 2018.

[4] Sallis et al. 2006. *An Ecological Approach to Creating Active Living Communities*. Annual Review of Public Health.

[5] Carson et al. 2016. Systematic Review of Sedentary Behaviour and Health Indicators in School-Aged Children and Youth: An Update. Applied Physiology, Nutrition, and Metabolism.

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[7] National Recreation and Park Association. 2015. LGBTQ Teens in Recreation Programs. https://www.nrpa.org/parks-recreation-magazine/2015/july/lgbtq-teens-in-recreation-programs/ Accessed on October 4, 2018.

[8] Community Foundation of Mississauga. 2018. Mississauga's Vital Signs. https://www.cfofm.org/mississauga-vital-signs Accessed on September 27, 2018.

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[10] United Way Greater Toronto. 2017. The Opportunity Equation in the Greater Toronto Area: An Update on Neighbourhood Income Inequality and Polarization.

4.0 Older Adult Programming

4.1 Overview

This section describes the scope of programs and services available to older adults - including marginalized populations - in Mississauga, how these programs and services are provided, and measures that can enhance service delivery. Analyses and recommendations consider community development and supports, volunteerism, financial sustainability, program and service offerings and measuring performance. The considerations are based on community inputs, the current participation levels, trends, research and best practises in like jurisdictions.

Table 3 outlines older adult participation in recreation services as provided by both the City of Mississauga and the collective of Older Adult groups (clubs/providers) in Mississauga. Overall participation in City offered programs and services for Older Adults increased by 9 per cent between 2015 and 2017, amounting to 20,500 more registrations and scans across a number of program categories. While attendance in aquatics programs has declined by 12 per cent, attendance in fitness, skating and therapeutic opportunities have all increased. Most notably, participation in the therapeutic opportunities has increased significantly by 150 per cent thus indicating a growing need to strengthen mobility in older adults. Attendance in City offered opportunities at the Mississauga Seniors Centre has remained stable.

Table 3: Older Adult Participation in Recreation, 2015-2017

Participation (Membership Scans)	2016	2017	2018
Aquatics	71,900	69,300	64,200
Fitness	139,800	146,700	162,100
Skating	400	300	300
Therapeutic	22,200	31,300	34,800
Total	234,300	247,600	261,400

Note: figures rounded to the nearest 100
Source: City of Mississauga, 2018

4.2 Observations from Research & Consultations

Selected observations uncovered through research and consultations included the following:

- **Desired Opportunities** – three out of ten older adult survey respondents (30 per cent) indicated that the City of Mississauga does not provide activities that they would like to see offered in the future. Among these individuals, the top five activities that they would like to be offered or expanded in the future include: arts and crafts, day trips, meet ups/coffee cafes, hiking groups, cooking and healthy eating classes. In fact, the City does provide these opportunities, leading to the need for increased communications and promotion of activities.

- **Therapeutic Programs –** the increase in therapeutic recreation has been significant over the course of the last three years. While increased participation is generally an indicator of excellent

service provision, further work could be completed to analyze what programs have shown the greatest increases, where there are pent up demands, and communicating with participants to determine future needs and determine potential service improvements.

- **Intergenerational opportunities between Older Adult and other age groups** – examples of other age groups that older adults want to interact with include youth and young professionals, etc. Older adults want the opportunity to engage with other age groups. Older adults felt that such relationships could introduce them to new technologies, reduce isolation and provide them the opportunity to teach youth about past experiences, and offer knowledge about skills like cooking of heritage dishes and carpentry for example. Older adults felt that they would like to learn from youth and enjoy a multi-generational relationship while youth consulted through the concurrent Youth Plan for Recreation indicated an eagerness to share their knowledge and learn from older adults. Older adults felt that it would be very beneficial to have these mutually supportive relationships.

- **Popular Physical Activities** - the top physical activities that older adult survey respondents engaged in are fitness (49 per cent), walking (43 per cent), and swimming (35 per cent). More sedentary activities included reading (39 per cent) and attending theatre/shows (34 per cent).

- **Activities Pursued at Home** - 24 per cent of older adult survey respondents indicated that they participate in social and physical activities most often at home. Tools to make active choices the easier choice might include the development of videos and online access to exercise that could be done from home to encourage greater activity levels in older adults.

- **Ability to Participate** - 43 per cent of survey respondents indicated that nothing prevents them from participation in physical activities as often as they would like. This information may lead to the City and partners gaining a better understanding of what might motivate older adults to become more active in Mississauga.

- **Indoor Aquatics and Hydrotherapy** - many workshop attendees firmly believe in the benefits of hydrotherapy and urged the City to allow greater use of these aquatic facilities during non-peak hours (daytimes, etc.) for older adult use.

- **Universal Programs** - Older adults have pointed to the City's approach to providing universal programs for children and youth as having increased participation in those age groups and believe that a similar approach for older adults could increase active participation among those 55 years and over. The City has had exceptional response to its universal programs, children and youth in afterschool programs, and summer drop-in playground opportunities which are offered at no cost to participants and are sponsored by corporate partners. This has been an innovative approach in addressing times when children and youth require engagement in physical activity under the supervision of qualified and caring adults could also be applied to older adults.

4.3 Definition of Older Adult

There are varying definitions of what constitutes an older adult depending upon the City Department, Division and even the type of program/service being offered. In terms of many recreation programs, 87 per cent of the older adult survey respondents agree with the City of Mississauga Recreation Division's current definition of "Older Adult" which encompasses persons 55 years and older. Some respondents

spoke to the City considering ability-based programming geared toward one's ability not age (and it is worth noting that the City in fact already does this by offering varying levels of fitness courses, continuums in general interest opportunities and therapeutic recreation).

Historically, the term senior has been used to label people that are over the age of 65 and in their retirement years. In today's context, many people over the age of 65 no longer associate themselves as being a "senior citizen" given that people in this age group generally tend to live longer, continue to remain busy, and enjoy active pursuits to a greater degree than in the past. Over 87 per cent of people surveyed in Ontario's Aging Plan reported feeling younger than their actual age.[1]

The terms "senior" and "older adult" are presently used interchangeably within the Recreation Division. This can create inconsistencies, and sometimes confusion when communicating, labelling and delivering services for a specific market segment. Utilizing a single term to define the program category would serve to deliver a more consistent brand and avoid confusion among residents that may not otherwise understand if there is a difference between a "senior" and an "older adult" service.

Mississauga's age-based definition presently defines older adults as persons 55 years and above. The definition may be applied differently throughout the Corporation as well as other agencies depending upon the type of service and legislative requirements (e.g. where aligning with criteria such as Old Age Pension, services covered through provincial healthcare, etc.). From the perspective of recreation services, the 55+ age category remains appropriate and is generally consistent with other municipalities across Canada (though there is some differentiation with some communities starting as low as 50 years of age).

Mississauga's programming is also reflective of different levels of ability within the 55+ definition. The City offers a broad range of active and passive physical activity choices, recreational and cultural pursuit opportunities, and activities geared to education and socialization. In this way, a Mississauga older adult of any age has an opportunity to participate in some form of activity regardless of their physical ability.

4.4 Access and Inclusion

Mississauga strives to be inclusive and to ensure access to all marginalized populations in all of its work. It is especially important for community centres and program spaces to be welcoming and safe in the delivery of services. There are specific marginalized populations who continue to need intentional outreach and discussions to ensure that access and inclusion goals can be met.

- **LGBTQ+ Community** - Older adults in the LGBTQ+ community may sometimes experience discrimination and unwelcoming comments in community centres. It is important to train staff and organizations in ways of ensuring that all populations are welcome. As an example, the City of Toronto supports the 519 Community Centre which is specifically geared to providing programs and services to the LGBTQ+ community. With an overall growth in population in Mississauga, it is appropriate to meet with members of the LGBTQ+ community to ensure that their recreational needs are being met and/or to work to facilitate greater opportunities.

- **Indigenous Understanding -** The Truth and Reconciliation Report commissioned by the Government of Canada - regarding the impact that residential schools had on Indigenous peoples – is influencing service provision within a number of municipalities. The Report recommends that all levels of government become part of the healing required to address the

significant negative impacts. Municipal governments and school boards across Ontario are advancing this healing by reaching out to Indigenous organizations and peoples to work collectively.

- **Persons with Decreased Mobility and Disabilities -** The City has made great strides in working with organizations that serve persons with decreased mobility and disabilities to develop meaningful programs and supports. As older adults age, some may face decreased mobility which must be recognized in program design and the provision of additional supports. An opportunity exists to work with those with decreasing mobility to teach physical literacy to enable these residents to participate with more knowledge and ability. It is noted that the Therapeutic Line of Business has shown increasing growth in participation to address rehabilitative needs and/or ongoing exercise to address chronic health issues. The Therapeutic Line of Business in Mississauga is a leading practice in Ontario.

- **Persons with Low Income Backgrounds -** The Active Assist policy provides funding for older adults who are experiencing financial difficulty. Often older adults are too proud to be forthcoming about needing financial assistance and cannot participate in recreational programs as their limited funding is spent on food and shelter. The City has been proactive and promotes the Active Assist program in the Recreation Active+ Guide. Added promotion through agencies serving lower income older adults will serve to increase participation and garner greater penetration rates.

- **Isolated Older Adults –** Statistics Canada estimates that 16 per cent of the older adult population experiences social isolation. Suicide rates in older adults over the age of 65 years is the highest of any age group in Canada. Baby Boomers have higher suicide rates than previous generations and research shows that those who do have a death by suicide have tried two to four times previously. Older adult males, particularly those widowed, have the have the highest rates of death by suicide at 33 out of every 100,000 residents per year. The cause of death including death by suicide may be less rigorously investigated than in younger people.[2] This alarming statistic prompts all related stakeholders to engage isolated older adults in recreational and social pursuits and as well to assist them in accessing the respective services that they may need. With this in mind, an emphasis on male participation in recreation pursuits is appropriate.

The Recreation Division by working with Community Groups and organizations who represent diverse/marginalized older adults will be better able to understand the recreation needs to either modify offerings or work with groups who offer programs and services to facilitate access within Community Centres to these unique populations. The Recreation Division should continue to work with Community Partners to develop a marketing/promotional and educational program targeted at older adults on the benefits of being engaged in recreation and active opportunities. The Recreation Division should work with community partners to better understand the penetration rate of older adults using recreation and related services in Mississauga.

The greater demand and expectation from the public for seamless services and support from municipalities, agencies, and other levels of government has obscured the lines of responsibility, particularly in multi-use community centre settings. The Recreation Division falls within the scope of Community Services Department, which some members of the public may perceive as social services. The Recreation Services Division has strong ties with its Community Partners. A thorough review of the services and programs offered by the City of Mississauga's Community Partners within each service area should be completed and promoted within the Community Centres, enabling the

Recreation Service Division to continue to concentrate on providing strong Recreation services while connecting our residents to the appropriate social service providers as appropriate.

4.5 Low Cost/No Cost Programs

The City of Mississauga has been proactive in including all older adults with consideration to their ability to participate in recreational pursuits. Efforts to include diverse populations, older adults from lower income backgrounds and the introduction of therapeutic recreational opportunities for those with limited mobility. The City also promotes access to no cost opportunities such as special events and the use of trails and amenities in the public parks system. The engagement of older adults in developing the Plan resulted in suggestions for universal (no cost/low cost) access opportunities for all older adults that are regularly scheduled and offered at no cost to the participant to allow all older adults to participate with no barriers. These additional opportunities would serve to increase participation given the growth in the older adult population. The sponsorship of these programs could be similar to the afterschool and summer programs offered to children and youth that are sponsored thus not imposing additional costs to the City. This is not a new concept to Mississauga however expanding this approach to the older adult population would expand opportunities currently offered to children and youth.

With over half of the participants in older adult opportunities preferring multi-purpose centres, these universal opportunities could be piloted at these centres first, however strong consideration should be given to opportunities in priority neighbourhoods where there are higher rates of residents experiencing lower incomes, isolation and other limiting factors.

4.6 Programs offered through Older Adult Groups

The City strives to offer a balance of programs that appeal to a wide range of older adults. Most directly offered programs and services focus on healthy aging and active opportunities such as swimming, water exercise, golfing, kayaking, fitness memberships and classes. The City hosted the Ontario 55+ Summer games in 2018 and saw athletes from across Ontario compete in active and social pursuits.

The Active+ Older Adult Resource publication also promotes opportunities offered at the Mississauga Seniors Centre and the Active Adult Centres of Mississauga. Both centres offer a range of programs including social (Horseshoes, Bingo, Bridge, Billiards, Mah Jong, Euchre), arts (Opera, Camera, Swing Band, Dance) wellness, travel, lifelong learning and multi-cultural opportunities. The Active Adult Centre of Mississauga also offers a Telephone Reassurance Program for isolated older adults; these residents are called daily by volunteers offering support. The 47 Older Adult Clubs operating out of community recreation centres also offer a range of social opportunities to their members and some active programming.

The role of the City is to balance older adult interests, especially with the clubs and groups offering their respective services utilizing City owned community centres and spaces. An analysis is appropriate every few years to ensure that there is a balance of opportunities, any pent-up demands are being addressed and prevalent social issues are considered with emphasis on marginalized populations to ensure that barriers to participation are addressed. Continued dialogue and stronger relationships with should include but not be limited to newcomers, the LGBTQ community, isolated older adults and those serving them) and other diverse marginalized groups.

4.7 Programs offered through Community Partners

The Recreation Division works with a multitude of stakeholder groups through the Community Group Registry Program as previously discussed in this report. The City provides benefits to those groups who qualify through their non-profit and residency status. The City of Mississauga invests significant resources and it would be helpful to know what the return on its investment is in terms of the respective penetration rate of older adults engaged in recreation. Many of these community partners serve the older adult population and it would be beneficial to know what percentage of the older adult population the City and these non-profit groups serve. This collective of the City and the community partners would be a strategic starting point in gaining a more in depth understanding of the full breadth of providers, programs and services, how current issues affecting older adults are being addressed or could be addressed and understanding the penetration rate of older adults in these service areas. More focussed discussions would address the growth in the older adult population, identification of current and anticipated issues and a joint and knowledge-based approach.

4.8 Recommendations

Older Adult Programming Recommendations

7. The age definition of an older adult engaged in recreation programs and opportunities should be confirmed as being 55 years of age and above. This age definition should be consistently applied to all programs, policies and services administered throughout the Recreation Division.

8. Enhance inclusiveness and social connectedness through program delivery targeted to persons 55 years of age and over:
    a. Leverage sponsorship/grants (i.e. investigate opportunity to offer low to no cost activities through sponsorship).
    b. Ensure a balance of programs is being offered in conjunction with Older Adult Clubs/providers that are of interest to a variety of older adult populations (including but not limited to newcomers, indigenous persons, LGBTQ+ community, isolated seniors and diverse/marginalized groups).

9. Work with community partners to better understand the penetration rate of older adults using recreation and related services in Mississauga, and to work collectively to respond to emerging trends and issues.

[1] Government of Ontario. November 2017. Aging with Confidence: Ontario's Action Plan for Seniors. pp.8.

[2] Centre for Suicide Prevention

5.0 Allocation of Indoor Space for Older Adults

5.1 Overview

This section provides an analysis of the overall utilization of community centres and specifically by the older adult population and balance the requests from older adults for increased use of community centre spaces.

The uses of public spaces for all age cohorts must be allocated equitably and consider evolving needs. Traditionally, older adults utilized day time hours as children and youth are in school and adults are most likely in the workforce. The requirements are changing to accommodate older adults who may want to participate during the evenings and weekends, shift rotations, daycare and nursery schools and home schooling for example all have an impact as to how public facility spaces are allocated. Specific to this Plan, an analysis is offered as to how older adults are using various facilities and what their current needs are. It should be noted that there is no current data on pent up demands for older adult groups and City offered programs and services.

5.2 Observations from Research & Consultations

Selected observations uncovered through research and consultations included the following:

- **Intergenerational opportunities between Older Adult and other age groups** – examples of other age groups that older adults want to interact with include youth and young professionals, etc. Older adults want the opportunity to engage with other age groups. Older adults felt that such relationships could introduce them to new technologies, reduce isolation and provide them the opportunity to teach youth about past experiences, and offer knowledge about skills like cooking of heritage dishes and carpentry for example. Older adults felt that they would like to learn from youth and enjoy a multi-generational relationship while youth consulted through the concurrent Youth Plan Review indicated an eagerness to share their knowledge and learn from older adults. Older adults felt that it would be very beneficial to have these mutually supportive relationships.

- **Need for space** - there was an indication from the Older Adult groups and agency/community partners that there was a need for more space overall but specifically spaces for pickleball and other program opportunities.

- **Summertime Pressures** - Older Adult groups were disappointed that they had to be moved to other facilities during the summer months to accommodate children's camps at the facility where they participated at during the school year. There was a sentiment that being moved provided an inconvenience while there was respect that children's summer camp programs are important.

- **Testing Evening & Weekend Interest** - Older Adult groups indicated that they would like to pilot the opportunity to participate during the evenings and weekends to determine if there is a

demand during these times for older adult opportunities – although these demands have not been quantified.

- **Indoor Aquatics and Hydrotherapy** - many workshop attendees firmly believe in the benefits of hydrotherapy and urged the City to allow greater use of these aquatic facilities during non-peak hours (daytimes, etc.) for older adult use.

5.3 Current Space Utilization

Program rooms and gymnasiums provided in Mississauga's major and minor community centres allow for a broad range of activities for many age groups. To understand how well these spaces are being used, the number of hours available were compared to the number of hours being booked for programs and rentals for each room available through the Recreation Services Department. To inform how older adults could access these spaces, the analysis looked at peak months (September to June) versus summer months when camps and child/youth-focused activities took place, weekday versus weekend usage, as well as usage throughout different times of the day.

September to June Utilization

Between September and June, the space utilization analysis demonstrates that significant capacity exists within the Major Community Centres with the average weekday utilization rate within these centres being 51 per cent. Weekend use of program rooms and gymnasiums is also fairly low, resulting in over 47,000 hours going unused on Saturdays and Sundays; weekend room rentals are booked sporadically and offering long term rental contracts during this time would severely limit this line of business.

Minor community centres are characterized by multi-purpose rooms located in single-purpose facilities such as halls and arenas. Such rooms may not be suitable for all types of programming and events, but at the very least are conducive to meetings and gatherings. The weekday utilization rate stands at 17 per cent and the weekend utilization rate is 14 per cent at these facilities.

Utilization in the summer months is at or near capacity during the daytime on weekdays; that being said, there is fairly low utilization rates during summertime weekends. Given the growth in Older Adult population, a review must be completed to ensure a better balance in servicing this populations needs in the summer months.

- The need for additional spaces for Older Adult group operated activities has not been quantified; although with the aging population, this demand will most likely increase.

- The current overall utilization of community centre spaces rests at 51 per cent of the overall capacity of these facilities during daytime and weekend use year-round.

- The rooms that are in greatest demand are gymnasiums and multi-purpose rooms while the room types in lowest demand include smaller meeting rooms.

- There may be an opportunity to repurpose rooms with lower utilization to include amenities that could increase their use.

- The types of activities would be relegated to the design and configuration of each individual room.

A review of current space utilization needs to be conducted to ensure spaces are being used appropriately in order to maximize availability for Older Adult programs and services

5.4 Future Space Planning

The principles that support the allocation of space within community centres -will need to be revisited with respect to the aging population. There will be additional use required and possibly during non-traditional hours. Further, there should be greater recognition that each Service Area is different with differing recreation needs. Currently programs and services offered by the City of Mississauga take precedence before the allocation of space to community organizations and rentals etc. The City's current priority status for the allocation of indoor recreation facilities governs the allocation of program space including space utilized by older adult groups.

This approach has worked well as staff are successful in their role to assess and deliver on the needs of all age groups and abilities as well as to assess and change the delivery of services based on participant feedback and pent up demands. The development and formalization of these principles will strengthen staff's ability to be locally responsive within the planning areas. Allocation principles may include the percentage of the varying age cohorts, socio-economics, recreation preferences, transportation needs, the balance of club offered, and City of Mississauga offered programs and services, availability of the resident's time to participate, geographic distribution of programs and services, child and youth development and neighbourhood strengthening priorities at a minimum.

5.5 Recommendations

Allocation of Indoor Space Recommendations

10. Review and revise the Master Scheduling Plan for Rooms and Program Spaces with all stakeholders involved (considering factors such as equity, demand, participation, preferences, ability, demographics, socio-economics, etc.).

11. Quantify demands and move the appropriate rentals and facility uses from community centres with pent up space demands to facilities with lower utilization within a given planning area, including relocation of City staff utilization (e.g. meetings, training, etc.). In doing so, the City should continue to work to accommodate summer-use requirements for older adults through the use of freed up space at facilities, utilization of facilities with capacity and the use of local and minor community centres.

6.0 Future Older Adult Facility Design and Space Needs

6.1 Overview

This section articulates the facility provision model for older adult recreational space along with certain design features associated with these facilities.

6.2 Observations from Research & Consultations

Selected observations uncovered through research and consultations included the following:

- Older adult representatives emphasized the transportation mobility challenges in Mississauga, particularly for persons relying upon transit. Often times, transit stops were noted to be too far from community centre entrances or the homes of older adults thereby posing challenges for persons with limited mobility.

- A desire for common areas in community centres to be more welcoming and conducive to informal gathering was indicated. With affordability being a concern for a number of older adults, there is less of an ability to frequently rely on multipurpose rooms due to rental costs, thus the ability to gather within common areas was noted as an opportunity (this was supported through a recommendation by the 2019 Future Directions Recreation Master Plan).

- Barrier-free and accessible designs were noted as being an important consideration within existing and future community centres. Having a sense of safety within the facilities was also important to older adults.

6.3 Optimization of Recreation Facility Space

The City offers integrated space for older adults at eight multi-use community centres. Dedicated spaces are operated through the Mississauga Senior Citizens Centre and the Active Adult Centre of Mississauga (formerly the Square One Seniors Centre), the latter of which is located at the Central Parkway Mall. Additionally, the City of Mississauga handles the booking of common space at the Region of Peel's Creditvale Mills seniors' housing development in exchange for a certain number of hours being provided at no cost to the City by way of an Amenity Space Agreement.

Over the past five years, older adult space needs have been thoroughly explored through the 2015 Older Adult Spaces and Services Plan, the 2016 Recreational Indoor Facility Infrastructure Strategy, and the 2014 and 2019 Future Directions Recreation Master Plans. Each of these analyses have rationalized a future facility provision model that supports the City's practice of delivering integrated 55+ programming through multi-purpose spaces located in community centres rather than expanding the supply of dedicated seniors' centres. Community input and best practice scans conducted for these studies have revealed a preference among younger generations of older adults (e.g. Baby Boomers) for older adult programs within multi-generational settings. This integrated model provides greater access to more amenities such as pools, therapeutic tanks, libraries and arenas.

The City of Mississauga 2019 Recreation Master Plan makes a number of recommendations that will increase the space for older adults, notably through:

- Developing social spaces in lobbies of community centres to provide welcoming spaces for older adults and other age groups (Recreation Master Plan Recommendation #12);
- Revitalizing the Mississauga Seniors Centre (Recreation Master Plan Recommendation #13);
- Relocating the Glenforest School Pool to Burnhamthorpe Community Centre and integrating an area conducive to older adult programming as part of the community centre expansion (Recreation Master Plan Recommendation #14);
- Relocating the Cawthra School Pool to Carmen Corbasson Community Centre which will expand the capacity of that facility, along with the Mississauga Seniors Centre, to deliver active programs to meet the needs of older adults and other age groups (Recreation Master Plan Recommendation #4).

6.4 Accessibility

The 2017 Canadian Survey on Disability found that 6.2 million people reported living with some form of disability, most commonly identified as pain-related, flexibility, mobility and mental health-related. This amounts to 22 per cent of the population, a substantial increase from the 13 per cent of the population (3.8 million people) reporting living with a disability in the 2012 Survey on Disability. The aging population has contributed to this increase and along with the Accessibility for Ontarians with Disabilities Act, building designs will need to continue to require consideration of persons with special needs.

6.5 Future Space Accommodations

With younger older adults (i.e. those in the 55 to 65 year category) increasingly shunning facilities and clubs viewed or labeled as for ‘seniors’, an integrated multi-generational space model affords efficiencies of use based on: 1) time of day (e.g. older adults may use it during day time hours and youth or general programming can take place in the evening but having the flexibility to adjust time of day usage by needs, including for older adults); 2) geographic distribution as rooms are spread across the City as opposed to centralized in single sites thereby minimizing travel; and 3) costs related to construction and operation.

Analyses of multipurpose program room and gymnasium rates contained in Sections 5 and 6 of this Plan reveal that hours are generally available across all Service Areas to accommodate more usage. It is acknowledged that all rooms may not be of a size or configuration to allow some programs to be run, however, it is also acknowledged that additional usage could take place targeting a 70 per cent utilization benchmark.

Upon its opening, the new Churchill Meadows Community Centre will also add over 2,000 weekday hours thereby increasing system-wide capacity by 8 per cent. The 2019 Recreation Master Plan’s recommendations to add indoor aquatic centres to the Burnhamthorpe and Carmen Corbasson Community Centres will also strengthen intergenerational programming at those destinations, including for older adults. For existing community centres that are not being redeveloped, their multipurpose rooms, gymnasiums and common areas should be reviewed as to how older adult needs could be

better serviced as appropriate, while retaining intergenerational programming flexibility to the greatest degree possible.

Therefore, no additional dedicated seniors' centres are recommended at this time. The City's existing strategy supports a neighbourhood-based service delivery model anchored by the centralized older adult hubs at the Mississauga Seniors Centre and Active Adult Centre of Mississauga (along with Creditvale Mills to a lesser extent). As demonstrated in this Plan, a surplus of program and meeting space exists providing further rationale that construction of additional dedicated older adults' centres would not better serve the needs of older adults. Overall, resources would be better directed towards maximizing the use of existing infrastructure.

6.6 Age Friendly Communities

In 2007, the World Health Organization (WHO) developed a guide based on its Global Age-Friendly Cities Project. The WHO identified that 'active aging' depends upon several influences much like the Public Health Agency of Canada's Social Determinants of Health. Where provincial recognition programs exist, communities have demonstrated that they have met a number of age-friendly community milestones and are recognized by their province as officially moving toward becoming age-friendly. Provinces may seek additional recognition for their communities from the Public Health Agency of Canada and the WHO.[xiii] While the Age-Friendly Community initiative is a region wide initiative it is supported by Council as being a worthwhile endeavour for Mississauga. The City of Mississauga appears well positioned to meeting a number of these milestones as well as the various criteria articulated in the WHO age friendly community checklist. Recreation Services is represented and is working with the Older Adult Advisory Panel and other agencies and departments to achieve this designation as the lead agency. Recreation staff may not have the expertise in all areas of the criteria as required. It would be best to consider Recreation Service's continued participation but consider alternate leadership at this time.

6.7 Recommendations

Future Older Adult Facility Design and Space Needs Recommendations

12. In order to optimize recreation facility space, future additions to the supply of spaces supportive of older adult recreation programming and services should come in the form of shared and/or integrated spaces within community centres rather than a stand-alone centre dedicated exclusively to older adults. At centres that are not being redeveloped, unique spaces for Older Adult use will be incorporated as appropriate.

13. Update design standards for recreation facility development/redevelopment projects to reflect the needs of older adults through elements such as (but not limited to) comfort, accessibility, and socio-demographic needs.

14. As accessibility will be a fundamental influence in design, a coordinated approach with transportation services including MiWay, handicap parking locations, drop off lanes to offer transit to (or as close as possible to) the front door of community centres should be undertaken at the time when community centres are designed and/or redeveloped.

Future Older Adult Facility Design and Space Needs Recommendations

15. Upon opening of the Churchill Meadows Community Centre, undertake the following strategies:

    a. Leverage the considerable addition of program space (including the 1,700+ weekday daytime hours) that will be available through the new Churchill Meadows Community Centre for the delivery of older adult programs and services, as part of its broader intergenerational programming/rental complement.

    b. Transition selected programs from the Churchill Meadows Activity Centre to the new Churchill Meadows Community Centre, once opened, thereby allowing a greater degree of time – estimated to be in the range of 2,000 daytime hours throughout the year – at the former to be allocated towards older adult programs and services.

[xiii] Public Health Agency of Canada. Age Friendly Communities website.

6.0 Implementation Plan

This Older Adult Recreation Plan is a multi-year phased plan to guide the actions, responsibilities and budget decisions of the City of Mississauga with regard to older adult programs, services and facilities in Mississauga. To assist in implementation, this section summarizes the Plan's recommendations, including proposed priority and timing, as well as a process for monitoring and updating the plan.

The City should regularly review and assess, and periodically revise the recommendations of the Older Adult Recreation Plan to ensure that they remain reflective of local conditions and responsive to the changing needs of the community. This will require monitoring of activity patterns, tracking user satisfaction levels, consistent dialogue with community organizations, annual reporting on implementation and short-term work plans, and undertaking a detailed five-year update to the Plan. Through these mechanisms – or as a result of other internal or external factors – adjustment of resource allocations and priorities identified in this Plan may be required.

Reviewing this document requires a commitment from all staff involved in the delivery of older adult programs and services. The following steps may be used to conduct an annual review of this plan:

- review of the past year (recommendations implemented, projects undertaken, success/failure of new and existing initiatives, changes in participation levels, issues arising from the public and community groups, etc.);
- identification of issues impacting the Plan (anticipated financial and operational constraints, emerging opportunities, etc.);
- cursory review of the Plan for direction regarding its recommendations; and
- preparation of a staff report to indicate prioritization of short-term projects and determination of which projects should be implemented in the coming year based upon criteria established by staff (e.g., limitations, community input, partnership/funding potential, etc.).

The Implementation Table contained in the pages that follow summarizes the Plan's recommendations along with assigned level of priority and suggested timing.

Priorities

These are identified as high, medium and low priority based on community demand and resources available to the Division.

Timing

Short (1 to 3 years), medium (3 to 5 years), and long-term (5 to 10 years) timing is proposed to help staff create work plans.

Key Focus Area & Recommendations	Priority	Timing
Older Adults Service Delivery		
1. Align all Older Adult Clubs and providers to the Community Group Registry Policy and revise the policy to provide clarity on program offerings and delivery.	High	Ongoing
2. Continue the work of the Older Adult Advisory Panel and other key older adult group stakeholders to assist with the implementation of the Older Adult Plan.	High	Ongoing
3. Review operating model and space needs with Mississauga Seniors Centre membership.	Medium	Short-Term
4. Review the use of Older Adult Club/provider donations and Seniors Active Living Centres (SALC) grant funds to ensure a streamlined implementation in compliance with the Community Group Registry Policy recommendations.	High	Short-Term
5. Ensure the Recreation Division has the organizational structure to support the delivery of current and future older adult committees, programs, activities, processes and services.	High	Short-Term
6. Provide relevant training to all staff and volunteer executives serving older adults about legislative and quality assurance methodologies and implement a quality assurance program for City of Mississauga Older Adult recreation services provision.	Medium	Short-Term
Older Adults Programming		
7. The age definition of an older adult engaged in recreation programs and opportunities should be confirmed as being 55 years of age and above. This age definition should be consistently applied to all programs, policies and services administered throughout the Recreation Division.	High	Short-Term
8. Enhance inclusiveness and social connectedness through program delivery targeted to persons 55 years of age and over: a. Leverage sponsorship/grants (i.e. investigate opportunity to offer low to no cost opportunity through sponsorship). b. Ensure a balance of programs is being offered in conjunction with Older Adult Clubs/providers that are of interest to a variety of older adult populations (including but not limited to newcomers, indigenous persons, LGBTQ+ community, isolated seniors and diverse/marginalized groups).	High	Short-Term

Key Focus Area & Recommendations	Priority	Timing
9. Work with community partners to better understand the penetration rate of older adults using recreation and related services in Mississauga, and to work collectively to respond to emerging trends and issues.	Medium	Short-Term
Allocation of Indoor Space for Older Adults		
10. Review and revise the Master Scheduling Plan for Rooms and Program Spaces with all stakeholders involved (considering factors such as equity, demand, participation, preferences, ability, demographics, socio-economics, etc.).	High	Ongoing
11. Quantify demands and move the appropriate rentals and facility uses from community centres with pent up space demands to facilities with lower utilization within a given planning area, including relocation of City staff utilization (e.g. meetings, training, etc.). In doing so, the City should continue to work to accommodate summer-use requirements for older adults through the use of freed up space at facilities, utilization of facilities with capacity and the use of local and minor community centres.	High	Short-Term
Future Older Adult Facility Design and Space Needs		
12. In order to optimize recreation facility space, future additions to the supply of spaces supportive of older adult recreation programming and services should come in the form of shared and/or integrated spaces within community centres rather than a stand-alone centre dedicated exclusively to older adults. At centres that are not being redeveloped, unique spaces for Older Adult use will be incorporated as appropriate.	High	Ongoing
13. Update design standards for recreation facility development/redevelopment projects to reflect the needs of older adults through elements such as (but not limited to) comfort, accessibility, and socio-demographic needs.	Medium	Medium-Term
14. As accessibility will be a fundamental influence in design, a coordinated approach with transportation services including MiWay, accessible parking locations, drop off lanes to offer transit to (or as close as possible to) the front door of community centres should be undertaken at the time when community centres are designed and/or redeveloped.	High	Ongoing

Key Focus Area & Recommendations	Priority	Timing
15. Upon opening of the Churchill Meadows Community Centre, undertake the following strategies: a. Leverage the considerable addition of program space (including the 1,700+ weekday daytime hours) that will be available through the new Churchill Meadows Community Centre for the delivery of older adult programs and services, as part of its broader intergenerational programming/rental complement. b. Transition programs from the Churchill Meadows Activity Centre & Library to the new Churchill Meadows Community Centre, once opened, and dedicate the available space – estimated to be in the range of 2,000 daytime hours throughout the year – at the former to be allocated towards older adult programs and services.	High	Short-Term

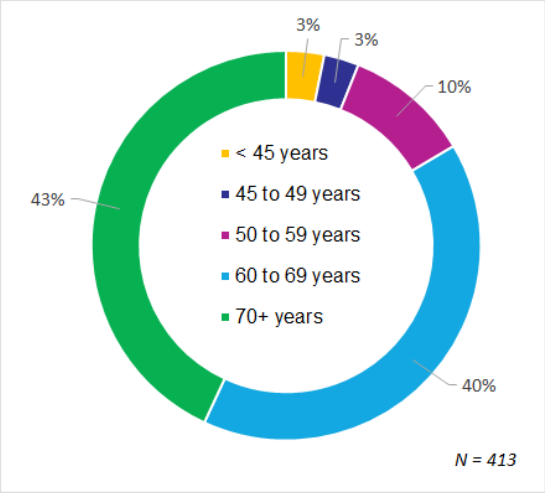
Appendix A Older Adult Survey Summary

To inform the Plan, a community survey was made available between June 4 and July 6, 2018. Designed specifically for Mississauga older adults, the survey included 28 questions designed with a targeted completion time of 10 minutes (average completion time was 13 minutes). The intent of the survey was to help establish an understanding of: reasons that older adults participate in recreation; popular activities and programs among older adults; barriers to accessing programs, facilities, and services; and to quantify participation levels.

The survey timing coincided with other consultation initiatives undertaken for the Plan so that it could be promoted through discussions with key stakeholders and targeted populations. As an incentive, participants completing the entire survey were eligible for a draw to win one of three $100 City of Mississauga recreation gift cards. The survey was available online and in hard copy format during the prescribed timeframe. A comprehensive tabulation of survey results can be found in Appendix A. Unless otherwise noted, totals may not add due to rounding, skipped questions, or a don't know/prefer not to answer response.

Older Adult Survey Results

The older adult survey received a total of 420 responses, of those 415 identified as residents of Mississauga and were able to proceed to the remaining questions. 43 per cent of the survey respondents indicated that they are 70 years of age or older, while another 40 per cent were within the ages of 60 and 69 years old, 10 per cent were between 50 and 59 years, and the remaining 6 per cent were below the age of 50. Just over half of survey respondents (52 per cent) reported being members of an Older Adult Club affiliated with the City of Mississauga or operated out of one of the City's community centres.



Participation

The vast majority (87 per cent) of respondents agree with the City of Mississauga's current definition of "Older Adults", which encompasses persons 55 years of age and over. Some of the written suggestions for a different definition of older adults included those that consider ability-based programming in recognition that age does not necessarily restrict certain peoples' abilities, or segmenting the age group into multiple tiers (e.g., 55 to 69 years of age and older adults aged 70 years and older).

Approximately half (49 per cent) of survey respondents participated in fitness or aerobics during the last 12 months, making it the most popular physical activity within the survey sample. Other common physical activities included walking for leisure (43 per cent) and swimming (35 per cent). The most common social activities participated in by survey respondents were reading (39 per cent) and attending shows/theatre (34 per cent).

Survey respondents were asked to identify up to three locations where they participate in physical or social activities most often. Almost one in four respondents (24 per cent) stated that they participated in social or physical activities most often at home. This could be due to the fact that there is a convenience aspect in not having to travel or the fact that much of a person's free time is usually spent within their home. However, the finding also may suggest an ongoing a need to encourage a portion of older adults to remain engaged in community activities outside of the home, particularly with studies identifying isolation among older adults as a growing concern. That said, common spaces for participation outside of the home included a branch of Mississauga Libraries (17 per cent), the Mississauga Seniors Centre (16 per cent), and Active Adult Centre of Mississauga (14 per cent). Among City of Mississauga Community Centres, the most visited locations were: Meadowvale Community Centre (14 per cent), Mississauga Valley Community Centre (13 per cent), South Common Community Centre (13 per cent), and Carmen Corbasson Community Centre (13 per cent).

Just less than one-third (30 per cent) of respondents indicated that the City of Mississauga does not provide activities that they would like to see offered in the future. Among these individuals, the top five activities that they would like to be offered or expanded in the future include: arts and crafts, day trips, meet ups/coffee cafes, hiking groups, as well as cooking and healthy eating classes.

Looking to future participation, 69 per cent of respondents believe they would use City of Mississauga Community Centres in five years' time and just under half (47 per cent) indicated that they expect to use the Mississauga Older Adults Centre in the same timeframe. This would suggest a potential growth in the use of community centres for older adult activities in the future and a continued preference for decentralized older adult programs and services across the City.

Volunteering

On a monthly basis, survey respondents spent an average 6.4 hours volunteering with 144 of them committing to one hour or more. Just over one-third (36 per cent) of survey respondents consider themselves very likely to serve as a volunteer in the community within the next five years. Another 22 per cent indicated they are somewhat likely to serve as volunteers within the next five years while the remaining 24 per cent indicated they are somewhat unlikely or very unlikely to serve as volunteers in the same timeframe. This aligns with the City of Mississauga Older Adult Recreation Spaces and Services Plan that observed volunteerism for older adult clubs is declining.

When asked what types of initiatives they are most likely to volunteer for, the responses were fairly evenly distributed among three top responses. One-quarter (25 per cent) indicated a health/hospital setting, 24 per cent noted social services, and 22 per cent believed they were likely to volunteer for a sports or recreation type initiative.

Barriers to Participation

On a weekly basis, survey respondents spent an average of 8 hours participating in social activities and an average of 7.4 hours participating in physical activities. Two out of five older adults (41 per cent) stated that nothing prevents them from participating in social activities as often as they would like. The most significant barrier experienced by 21 per cent of survey participants was caring for family members. Other notable barriers to participation in social activities were: illness/injury/health concerns (15 per cent), programs are too expensive (14 per cent), programs not offered at a convenient time (12 per cent), don't know what is available (12 per cent), too busy/lack of time (11 per cent), and need a friend to go with (11 per cent). Other barriers were reported by less than 10 per cent of respondents and have been captured in the Appendix summary calculations.

Similar to the response for participation in social activities, 43 per cent indicated that nothing prevents them from participation in physical activities as often as they would like. The most commonly noted barrier to participation in physical activity was illness/injury/health concern experienced by 24 per cent of respondents. Other notable barriers to participation in physical activities were: caring for family members (17 per cent), programs are too expensive (13 per cent), and programs are not offered at a convenient time (10 per cent). Other barriers were reported by less than 10 per cent of respondents but have been captured in the Appendix summary calculations.

Future Expectation of Participation & Services

Just under half (47 per cent) of survey respondents described their current activity level as low intensity consisting of things such as walking or playing cards, while another 43 per cent described their activities as medium intensity (e.g., dancing, speed walking). The remaining 8 per cent participated in high intensity activities such as jogging, cycling, or competitive sports.

Looking to the next five years, most participants believe they would be more physically active than they currently are. Only 26 per cent believe their activity levels would be low-intensity in five years' time while expected participation in medium intensity activities grew to 57 per cent of respondents, and just over one in ten respondents (11 per cent) expect to participate in high intensity activities.

When asked about fees for service, half of respondents (51 per cent) believe that Older Adult recreation programs should be discounted. One quarter (26 per cent) believe the discount should only apply to those with demonstrated financial need, and one-fifth (20 per cent) do not believe programs should be discounted for Older Adult recreation.

Regarding communication and information sharing, three common responses stand out as the best ways to inform participants about recreation services for older adults. These include: email (52 per cent), Active Mississauga Guide – online (47 per cent), and Mississauga Active+ Guide through recreation (41 per cent). Other commonly noted ways to inform participants of programs and services were: City of Mississauga website (28 per cent), Older Adult Expo/open houses (27 per cent), and newsletters/mail (26 per cent).

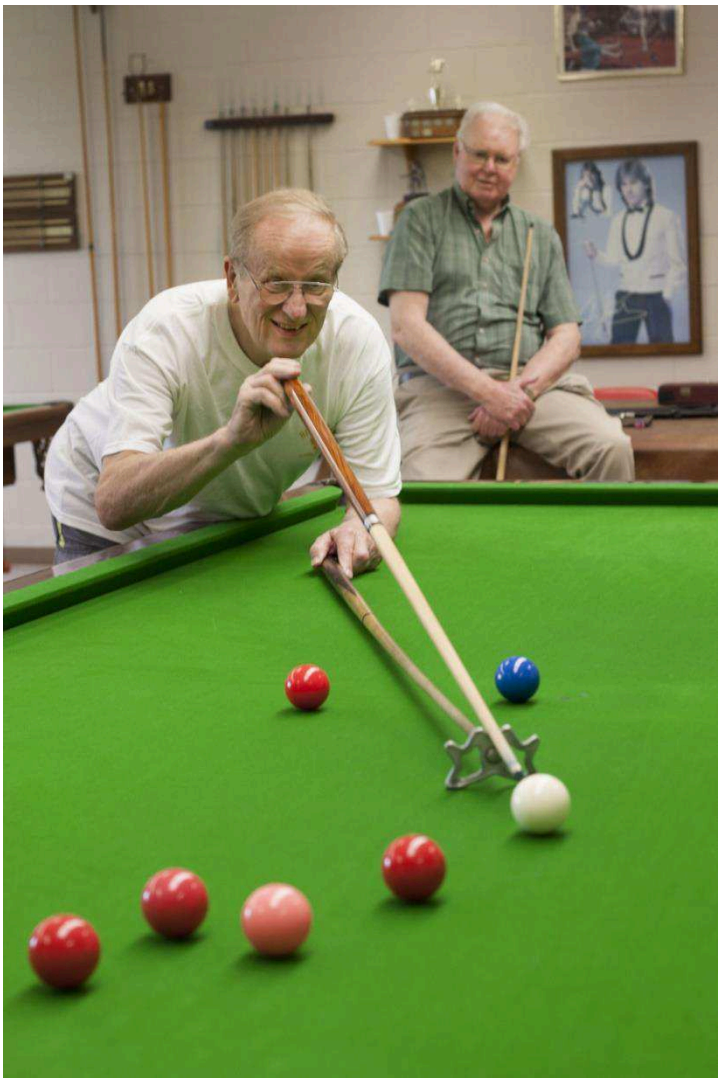
Sample Demographics

Four out of five survey respondents (81 per cent) are long-time residents of Mississauga, having lived in the City for 20 years or longer. One in ten (10 per cent) have lived in Mississauga for 11 to 19 years, while 4 per cent have lived here for 5 to 10 years, and the remaining 5 per cent for less than 5 years.

Survey respondents were fairly well distributed throughout the City, with most residential postal codes represented by at least one respondent. The greatest response (13 per cent) was from the L5M postal code (Churchill Meadows/Central Erin Mills/South Streetsville), followed by L5G (SW Lakeview/Mineola/East Port Credit) with 12 per cent of responses, L5N (Lisgar/Meadowvale) collecting 11 per cent of survey responses, and L5L (Erin Mills/Western Business Park) with 10 per cent Other postal codes were reported by less than 10 per cent of respondents but have been captured in the Appendix summary calculations.

Other characteristics of the survey sample included:

- The most commonly identified living situation was couple living together (48 per cent), followed by adult living alone (27 per cent), and couple with children (10 per cent). The remaining 13 per cent either live with extended family, as a single parent, or other circumstance.
- Only 6 per cent of survey respondents live outside of Mississauga for three months or more during the year, indicating that 94 per cent are permanent, all-season residents of the City.
- Four-in-five survey respondents were female (80 per cent), males represented 18 per cent and the remaining 2 per cent chose not to answer or indicated a gender identity other than male/female.
- Household income was fairly evenly distributed across all income brackets. Survey respondent household income was distributed as follows: less than $30,000 (11 per cent), $30,000 - $49,999 (17 per cent), $50,000 to $69,999 (13 per cent), $70,000 to $99,999 (9 per cent), and $100,000 or more (11 per cent).



Appendix B Older Adult Workshop Summaries

Session	Date	#	Agencies
Focus Group #1: Newcomer Agencies	June 6, 2018	4	Dixie Bloor Neighbourhood Centre, Indus Community Services, Newcomer Centre of Peel, Peel Newcomer Strategy
Focus Group #2: Community Centre Older Adult Committees I	June 6, 2018	40	n/a
Focus Group #3: Older Adult Advisory Panel	June 12, 2018	20	n/a
Focus Group #4: Community Centre Older Adult Committees II	June 12, 2018	4	Meadowvale Community Centre, Mississauga Older Adults Centre, River Grove Community Centre, Active Adult Centre of Mississauga
Focus Group #5: Older Adult Service Providers and Agencies Workshop	June 12, 2018	11	Government of Ontario, Local tennis clubs, Local health networks, Canadian Association of Retired Persons, Peel Public Health, Peel Council on Aging, Active Adults Centre of Mississauga

Malton Older Adults Workshop

Date: June 6, 2018, 2:30 PM – 3:30 PM
Location: Malton Community Centre (3540 Morning Star Drive)
Attendees: 40 Representatives from Mississauga's Community Centre Older Adult Committees (CCOACs) and users of the Malton Community Centre

A workshop was held in Malton in consideration of transportation barriers that exist for some older adults in that community and help to encourage their participation in the engagement process. A common theme throughout the discussion was that the older adults did not want to be labelled as being different from other people, preferring to avoid terms such as "older" adult or "senior" since those can bring about a perception. They embraced the fact that they were "mature individuals" and had "wisdom" to share with others although a few did believe that the term older adult or senior carries a sense of respect as well.

The group generally is supportive of the club-based setting in which many programs and services are delivered. They noted the benefits of group activities as keeping them socially engaged in their community and felt that strong leadership from club representatives was reflective of their opinions, needs and priorities.

While the workshop was primarily attended by those living or affiliated with the older adult clubs in Malton, there were other older adult committee representatives from other community centres. All of the CCOACs represented at the workshop indicated a tremendous growth in their membership; they view this as being positive but noted a challenge to accommodate their members within the space available to them, as well as to provide support for an increasing number of members. Attendees indicated

demand for additional public space to offer programs and events, with suggestions offered to host more social events (e.g., dinners, dances, workshops, etc.) and encourage anyone to attend (not only current older adult club members). This was viewed as a way to potentially stimulate activity in older adult populations and encourage social interaction.

Many of the older adult attendees believed that relationship building between themselves and local youth would be mutually beneficial. A mentorship program may enable youth to obtain their mandatory 40 hours of volunteer work while older adults could benefit from their assistance with everyday tasks. Similarly, many in attendance communicated a desire to host workshops and tutorials where older adults and youth could teach each other about their passions and skills. For example, older adults would like to share their culinary and dance skills while youth could educate older generations on how to successfully engage with technology and social media.

Participants discussed how they would like to be treated fairly and have opportunities to participate based on interest and ability, more so than age which they viewed as a narrow definition of themselves. Many participants indicated that “traditional” times for older adult’s programs do not necessarily align with a modern definition of “older adults” as many people in their 60’s and 70’s are still employed and are not always available during the day to attend programs. Attendees also identified barriers to participation including cost to participate, transportation to facilities, and knowledge about available activities. It was strongly suggested that Mississauga buses stop at the front door of community centres to allow access in inclement weather and to provide better access for those with limited mobility. There was an observation that there seemed to be many more females involved in older adult activities than males (which was borne out by attendance in this workshop, consisting of primarily women). It was suggested that the City explore ways in which to engage more men in older adult programming.

Of the 40 attendees, 5 volunteered that they had access to computers, although limited in some cases. Participants felt that communications still needed to be paper based through newsletters, the Active + Guide and postings at community centres. The group also indicated that they were not fully aware of what activities were available within all the groups at the Malton Community Centre. Many agreed that inter-club activities would provide an opportunity to share access to all activities and develop better ways of working together.

Older Adult Advisory Panel Workshop

Date: June 12, 2018, 9:30 AM – 10:45 AM
Location: Mississauga Valley Community Centre (1275 Mississauga Valley Boulevard)
Attendees: Older Adult Advisory Panel

The Mississauga Older Adult Advisory Panel was engaged in a workshop as part of a regularly scheduled meeting. Considerable discussion centred upon who and what constitutes an older adult, and the perceptions/stereotypes that older adults face from other age groups. The Panel emphasized ability more so than age, though they believe 55+ years remains generally appropriate recognizing there is a need to identify age to differentiate service and program delivery in recognition of the unique needs of the older adult age group. Their point, as heard in other consultations and through research conducted in support of the Plan, was that there is no one categorization or label that can be used to define an older adult, nor should the term limit what individuals think that they can achieve.

The Panel noted that older adults in Mississauga have begun to view recreation through a new lens, one where residents of all ages and abilities are able to recreate with each another and pursue common activities that they enjoy. In general, Panel members indicated that municipal programming should continue to be developed around interest and ability rather than emphasizing an age. Many stated that the City is doing well to provide for and support the CCOACs and they feel very fortunate to have the Panel and support from staff. Transportation remains one of the most significant barriers and suggesting a hope that the City will continue expanding program opportunities for older adults throughout Mississauga.

Panel members were adamant that communication is key to successful promotion and programming. They indicated that word of mouth remains the most reliable form of information sharing as there continues to be a generational and cultural divide among participants; some older adults are very tech-savvy while others prefer verbal interaction, while others may experience language barriers. The following suggestions were offered to maximize dissemination of information:

- multiple departments should be represented at meetings;
- publications should be user-friendly and offered in multiple languages;
- the Panel and program participants should be empowered to share their knowledge and experiences;
- promotion and information sharing needs to be continuous; and
- two-way communication with programmers and participants is encouraged.

Mentorship was a high priority for the Panel. Some members suggested that there may be benefit from recruiting university, college and high school students to participate in an intergenerational program focused on mutual tutelage. For example, retirees may be able to share knowledge from their work and personal experiences while students can share their academic resources and technological skills.

Community Centre Older Adult Committees Workshop

Date: June 12, 2018, 11:00 AM – 12:00 PM
Location: Mississauga Valley Community Centre (1275 Mississauga Valley Boulevard)
Attendees: 3 Representatives from Meadowvale Community Centre, Mississauga Seniors Centre, River Grove Community Centre, and Active Adult Centre of Mississauga

Building off of the older adult discussions in Malton, a second workshop was held with representatives of other CCOACs and dedicated seniors' centres. The discussion revolved around three themes being affordability of programs and services, types of programs and services offered, and increasing awareness of programs and services to maximize participation.

Attendees recognized that program pricing is a complicated process because some older adults in Mississauga have limited financial means where others who are affluent. For older adults that are retired and reliant on modest fixed incomes, their ability to participate in programs can be challenged. Additionally, the ability to access reliable, affordable, accessible transportation throughout the year is a challenge for many older adult residents.

At the other end of the spectrum are wealthier older adults who are willing and able to pay to participate. There was some sentiment that seniors have "earned the right" to be provided with free recreation activities while others had a different view whereby the City should be providing as wide a range of programming options as possible that are set to different price points reflective of factors relating to program frequency/convenience, quality of space or program type, etc. Overall, participants would like the City to review membership/drop-in fees and re-examine the level of discount provided to older adults, particularly for pool access and use of fitness centres.

To help alleviate geographic barriers, participants indicated a need for more programming and for programs/services to be distributed throughout the City. Program structure should be based on ability more than age; programs should provide opportunities for limber older adults to participate in high-impact recreation while others can participate in more therapeutic/mobility-based training. Many workshop attendees firmly believe in the benefits of hydrotherapy and urge the City to allow greater use of aquatic facilities during non-prime hours (daytimes, etc.).

Generally, participants urged the City to facilitate more opportunities for older adults to be involved in recreation directly. For example, older adults could be allowed to do things like volunteer at a café or coordinate events and foster engagement. Older adults could also coordinate focus groups or workshops/seminars to educate, promote music and the arts, or share a family legacy; the City could match older adults and youth together through similar interests. Coordination of bus schedules with program times or limiting seasonal influences such snow-clearing/removal and weather impedance were also cited as ways to improve the reach of programs and services to older adults.

Older adult-friendly publications and communication (paper/print) were emphasized as methods of program promotion and information sharing. Attendees suggested using technology in moderation, knowing that not all older adults have access or capacity to interact through digital mediums. As a method of encouraging social interaction and also promotion of activities and services, the representatives felt that the City should encourage older adults to share their voices. Sharing information directly with Mississauga's older adult clubs and committees would be an excellent way to disseminate information to older adults using those channels. This could also help reach isolated older adults through a concentrated effort to encourage and support these individuals.

Appendix C Agency & Partner Focus Group Summaries

Newcomer Agencies Workshop

Date: June 6, 2018, 12:00 PM – 1:00 PM
Location: Mississauga Valley Community Centre (1275 Mississauga Valley Boulevard)
Attendees: 5 Representatives from the Dixie Bloor Neighbourhood Centre, Indus Community Services, Newcomer Centre of Peel, and Region of Peel Newcomer Strategy

Newcomer agencies attending the workshops represented diverse cultural groups, each stating that their members form strong "familial" bonds based around culture and shared interest. In many cultural groups, newcomers find solace and a feeling of belonging through their interaction with people with similar backgrounds. While not necessarily providing physical activity as a source of recreation, the newcomer services and agencies identified the value of social activity. All participants stated their members, particularly older adults, feel at home when in their programs and find the health benefits and social encouragement allows them to thrive.

They believe that having newcomers to Canada participate in their respective programs reduces the chances of people feeling socially isolated. This is thought to be especially true for newcomer older adults who have not yet formed social connections or are less comfortable venturing far from their homes due to an unfamiliarity with language, the layout of the City and how to navigate it, and limited economic means. In fact, many newcomer service agencies identified that their customers are highly interested in recreation and the benefits it provides but find it difficult to attain their recreational goals because of cost. Attendees suggested that perhaps the City could offer workshops or targeted programs at little-to-no cost to help alleviate the financial barrier associated with participation.

Representatives from newcomer agencies in Mississauga identified a lack of space or program capacity as a dominant issue in their organizations. Many of their programs and services are limited by their ability to find adequate space in which to operate, partially because of the types and locations of spaces that they need. For example, agencies are ideally looking for facilities that are accessible for persons with disabilities as well as located along major transit routes and ideally within neighbourhoods as newcomers may not have their own vehicle or are still learning to navigate the City. Some were of the opinion that Mississauga community centres are optimal locations for their services but indicated difficulty gaining access to multi-purpose rooms due to allocation policies regarding rental and booking (regarding the number of people that are using the room and historic allocations, as cited examples).

It is noted that this workshop explored topics related to both the Older Adult Plan for Recreation and the concurrent Youth Plan for Recreation.

Older Adult Service Providers and Agencies Workshop

Date: June 12, 2018, 12:30 PM – 1:30 PM
Location: Mississauga Valley Community Centre (1275 Mississauga Valley Boulevard)
Attendees: 11 Representatives from the Government of Ontario, Local Health Integration Networks (LHIN), Canadian Association of Retired Persons (CARP), Peel Public Health, Peel Council on Aging, the Active Adults Centre of Mississauga and local tennis clubs

With such a diverse range of organizations present at the workshop, it was unsurprising that there was a wide range of terminology and criteria used to describe how each views an older adult. There was consensus, however, that older adults and seniors are no longer limited to sedentary and socially-focused recreation and leisure pursuits. Workshop attendees discussed the need to expand the City's definition of recreation to include physical, social, life/skill/hobby-based leisure pursuits; and incorporating exercise for the body, mind, and spirit. This expanded definition would enable programmers to provide more options and program times and consider drop-in versus regularly scheduled and registered programs.

Participants believe that programming provided by themselves and others should be based on interest and ability of individuals instead of restricted by age as some expressed a greater willingness to participate in activities based on perception of ability. Distribution and promotion of programs should focus on where older adults live and consider how to engage them in activities. Some were of the opinion that older adults are interested in more than "gentle fitness" and would like opportunities to go on day trips, participate in card games, or host cafes. They also emphasized the social connections that keep people interested and maintaining a sense of belonging, in additional any physical health benefits that they might derive.

The agencies and service providers discussed a need for additional indoor space to become available, particularly in the summer months, so that organizations can expand programs and not be "pushed out" by other programs and camps. One suggested solution to this issue was for the City to consider school access or dedicated spaces for older adults during peak demand periods for child/youth programs. The City might also seek non-traditional space and service providers to help accommodate demand (tennis clubs accommodating users during the day).

Workshop attendees also suggested exploring ways to encourage greater participation from newcomers, marginalized populations, and isolated older adults. A preferred method to achieve this is to send messages through faith-based organizations, community leaders, and translate publications and resources. They also felt that events such as the Older Adult Expo increases awareness and encourages participation among all older adults, and that the City should try to provide information in a "digestible way" to reach various segments of the older adult market.

Appendix D Staff Workshop Summaries

City Staff Workshops

Session	Date	#	Agencies
Workshop #1: Non-Recreation Staff I	June 5, 2018	7	Environmental Outreach, Transportation Planning, Culture. Human Resources, Security
Workshop #2: Managers	June 6, 2018	9	City of Mississauga Line of Business Managers, Community Development Coordinators, and FMT Representatives, representing: fitness, aquatics, older adults, youth, facilities, volunteers, sport development, and community programs
Workshop #3: Program Staff	June 6, 2018	10	City of Mississauga Fitness, Inclusion, Aquatics, Community Development, Customer Service, and Community Programs
Workshop #4: Non-Recreation Staff II	June 12, 2018	9	Active Transportation, Libraries, Transportation (MiWay), Parks Operation, Park Development, Sport Development, Special Projects (Culture)

Non-Recreation Staff Sessions (2)

Date:	June 5, 2018, 2:30 PM – 3:30 PM and June 12, 2018, 2:00 PM – 3:30 PM
Location:	Mississauga Valley Community Centre (1275 Mississauga Valley Boulevard)
Attendees:	16 representatives from various City of Mississauga departments including Mississauga Library Services, Sport Development, Park Development, Parks Operations, Environmental Outreach, Transportation Planning, MiWay, Culture, Human Resources, Security, and Special Projects (Culture)

Recognizing that there are City Departments and Divisions beyond Recreation whose services affect older adults; two workshops were held with non-Recreation staff. Given the wide range of responsibilities and services provided through these departments and divisions, discussions topics were diverse. It is noted that these workshops also explored topics related to the concurrent Youth Plan Review, however, only older adult-specific themes are presented as follows.

Departments view older adults in slightly differently ways, though generally recognize and understand the definition as persons 55 years of age and above. The Culture and Transportation staff mentioned that their respective Divisions have considered the previous Older Adult Plan to inform certain works undertaken, noting that the greatest ability for them to implement recommendations is when they are clearly identified for a specific Departmental Division or Unit. Otherwise there can be confusion or ambiguity in terms of who will lead an action and support it within their respective budget or funding sources. Other Departments do not actively refer to the document but are generally aware of the Older Adult Plan's overarching principles and intent.

Staff suggested assigning a designated departmental contact for the Older Adult Plan so everyone knows who is responsible for implementation (perhaps suggesting they are unaware of the current Older Adult Coordinator's role in this regard). To strengthen the coordinated approach and avoid duplicating efforts between multiple Lines of Business, managers should explore initiatives surrounding community outreach, coordinated program schedules, and joint promotion of activities and events. Various departments should also support intergenerational opportunities where older adults and youth work together even when responsibilities span more than one Department or Division. One cited example was to view parks as an extension of libraries (meet at the library and then walk to a park) or trip planning tutorials for older adults using MiWay on library computers with youth volunteers.

Staff continued on the topic of an intergenerational approach to programming. This would involve offering opportunities to interact with others as frequently and seamlessly as possible. In doing so, older adult participants could avoid social isolation and allow youth to learn from their peers and elders. One example of how this has been successful elsewhere is the addition of daycare into retirement homes; the older adults benefit from interaction with children to keep the minds and bodies active while the children learn from the experience of the older adults. Another example that is in place in Mississauga is through the Library system where residents of any age can sign up for computer assistance and youth provide tutorials to gain their mandatory secondary school volunteer hours.

City staff identified a lack of affordable housing as a challenge facing older adults in Mississauga, largely in the context that some older adults may not be able to "age-in-place" when they move or cannot afford the growing cost of living in the City. With most areas of Mississauga not originally planned/designed to be walkable, transportation can be difficult for older adults who are no longer able to drive, who are unfamiliar with the transit system, or those that do not have the physical activity level to travel longer distances using active transportation. It was noted that the upcoming Transportation

Master Plan will focus on providing transportation options (cycling, walking, and transit) for people aged eight to 80+, rather than focusing specifically on “older adult” or “youth” transportation needs. MiWay offers a targeted program for older adults through its $1 bus rides after 9:30 AM for that age group. The Transportation Department is working with the Planning Department to support walkable neighbourhoods and suggested encouraging participation/ minimizing barriers through promotion of cycling routes and other means.

Managers Workshop

Date:	June 6, 2018, 9:00 AM – 10:00 AM
Location:	Mississauga Valley Community Centre (1275 Mississauga Valley Boulevard)
Attendees:	9 City of Mississauga Line of Business Managers, Community Development Coordinators and FMT Representatives (represented: fitness, aquatics, older adults, youth, facilities, volunteers, sport development, and community programs)

A workshop was held with Recreation Division Managers of the various lines of business. Given the range of responsibilities and services provided through these units, discussion topics were diverse. It is noted that this workshop also explored topics related to the concurrent Youth Plan for Recreation, however, only older adult-specific themes are presented as follows.

Managers commonly identified a lack of role clarity as their positions and departments respond to the evolution of “recreation” and the older adult market, including a “grey area” where recreation services are blending with health and social services. Attendees reflected that social services such as emergency relief and support programs are becoming commonplace in their facilities, and wondered if there might be opportunities to partner with other organizations and agencies to supplement those services. In this way, the City should determine what the appropriate “pathway” is to providing such services to older adults. Line of Business Managers discussed how the Older Adult Coordinator position seems to be a corporate level position since being Age Friendly extends beyond the Recreation Division, but there is little authority for that staff person to influence holistic decision-making that is needed to guide the City’s overarching older adult objectives.

Workshop attendees also discussed the value of information and resource sharing in their Line of Business roles. The City offers a vast amount of programming and services as do many other private and not-for-profit organizations in Mississauga. It was stated that managers would feel better equipped to support their customers if they had more information on other programs, resources, services and facilities available throughout the City. With such information in hand, they could be a resource for older adults.

Managers also identified a need for more streamlining through process, policies, and information. For example, many customers don’t understand the difference between a therapeutic membership and a recreation membership. Discussion focused on the need to improve communication and information sharing to streamline business services. If both staff and customers have a greater understanding of what is available and how it functions, they will be better able to provide for one another.

Program Staff Workshop

Date: June 6, 2018, 10:30 AM – 11:30 AM
Location: Mississauga Valley Community Centre (1275 Mississauga Valley Boulevard)
Attendees: 10 City of Mississauga Program Staff (representing fitness, inclusion, aquatics, community development, customer service, and community programs)

A workshop was held with Recreation Division staff from various lines of business and program/service units. Given the range of responsibilities and services provided through these units, discussions topics were diverse. It is noted that this workshop also explored topics related to the concurrent Youth Plan for Recreation, however, only older adult-specific themes are presented as follows.

Workshop attendees were hopeful that the Plan could help Lines of Business establish timelines, priorities and determine appropriate allocation of resources. Additionally, the Plan should be aligned with the Youth Plan for Recreation as well as Future Directions as a whole, but they should also be structured such that the City of Mississauga's overarching goals may be achieved. Additionally, program staff would like for the Plan to help identify the role of Recreation in service provision. Echoing a common theme from other workshops, program staff questioned where the true responsibility of City of Mississauga Recreation Division lies (as it relates to the balance between recreation and social services).

Program staff noted some strategic planning opportunities that focus on maximizing access to, and participation in, City of Mississauga Recreation programs and services. Ideas included coordinating schedules so that older adults and youth are not competing for space within community centres, aligning program start and end times with public transportation schedules (including paratransit), and offering a wide variety of program options to target a wide range of interests and abilities.

Strategies oriented to staff training, transition, and retention were identified as opportunities to improve programs though it was acknowledged that this may be difficult to implement given the part-time or seasonal nature of many recreation employees. For example, program participants become very comfortable with particular instructors and often find the transition to new employees difficult to manage. Where possible, the City should consider succession planning and help support staff as they transition to various roles and programs.

One of the commonly discussed opportunities was to employ a more holistic approach is to review the membership passes offered by the City of Mississauga. Program staff indicated that residents frequently ask why the passes are not able to be used City-wide and have difficulty understanding the various membership types (e.g. therapeutic memberships). In order to better serve the residents of Mississauga, program staff suggested that memberships should be applicable across the City, and that programs and services should be distributed to reflect the needs of the various demographic groups identified within Mississauga.

To offer a holistic approach to programs and services, all involved Lines of Business should coordinate offerings and encourage participation by all residents. Some of the methods suggested to help encourage participation include reaching out to faith-based organizations where residents gather; offering culturally-diverse programming; and providing information in a variety of formats and languages.

Appendix E Older Adult Feedback Session & Survey Summaries

Nine Older Adult Feedback Sessions were conducted between the dates of May 1-10th in order to allow a comprehensive consultative process, ensuring each community was afforded the opportunity to be well represented without travel limitations. One additional session and one combined session in conjunction with the community meetings was held, presenting the consultation notes to the Older Adult Advisory Panel and the Mississauga Senior Council and also included these findings in the final report.

Facility Staff worked with their Older Adult Providers/Clubs to find an appropriate day and time that would work well with their communities to host the feedback session. The Facility Manager, operational and functional team supervisory staff was asked to attend the feedback session if possible in their Community Centres. Library Older Adult Supervisors were also asked to promote the sessions. Recreation Leadership Team members were also in attendance.

These one hour sessions included a presentation outlining the Recreation Older Adult Plan recommendations and were followed by a structured question period. At the end of the session, participants were given the option to complete a brief on line or paper copy survey surrounding the recommendations. For members of the public that wanted to provide feedback but were unable to attend the sessions, an email address (yourfuture@mississauga.ca) was used for residents to direct questions and comments to the attention of City staff that also included a copy of the survey in their response. Light refreshments and a complementary pass to any Recreation Drop In program was provided to our Older Adult participants as a thank you for attending and providing their feedback.

A flyer promoting the session was advertised at the Community Centres three to four weeks prior to the session date: Community Centre staff were asked to please post the flyer in their respective areas (i.e., gymnasium, fitness centre, pool, meeting rooms) and to promote the feedback session within the centre. The Community Program Supervisor invited the Older Adult providers/clubs to attend through the club executives, encouraging members to also attend. This invitation was reinforced by the Supervisor of Older Adults, Lorena Smith.

The City has documented and summarized all sessions in a manner that could be incorporated into the Older Adult Plan for Recreation where appropriate.

Schedule and participation of the Older Adult Feedback Sessions

Facility	Date	Room	Time	Libraries	Community Participation
Clarkson CC	May 1	Margaret Marland Room	9:30-10:30am	Clarkson, Port Credit, Lorne Park	18
Meadowvale CC	May 2	Youth/Seniors Room	2:30-3:30pm	Meadowvale	26
Malton CC	May 2	Multi-Purpose Room 1	10:30-11:30am	Malton	25
South Common	May 7th	Library Program Room	1:00-2:00pm	Sheridan, South Common	22
Burnhamthorpe CC (twinned with FM)	May 8	Fleetwood Room	9:30-10:30am	Burnhamthorpe, Frank McKechnie	13
Mississauga Valleys CC	May 8	LC Taylor Auditorium	11:30-12:30pm	Mississauga Valleys, Central, Cooksville	163
Mississauga Seniors Council	May 9th	Meeting Room (Erindale Hall)	9:30-10:30am)	-	9
Huron Park (twin C4)	May 9th	Iroquois A & B	11:30-12:30pm	Lakeview, Woodlands	42
Mississauga Seniors Centre/OAAP	May 9th	Lucy Turnbull Room	2:30-3:30pm	-	45
River Grove (twin with Erin Meadows, CMAC)	May 10th	Kaneff Gymnasium	10:00-11:00am	Churchill Meadows, Courtneypark, Erin Meadows, Streetsville	21
Total Participation					**384**

Question and Answer Section of the Older Adult Feedback Sessions

(Categorized into themes and the appropriate recommendations that articulate the issues)

Older Adult Programming	
Theme	Recommendation
○ Inconsistent Support for 55+ Age Recommendation - many found the term Older Adult objectionable; concern that already at-capacity Clubs/Providers would face further pressures (i.e. MSC, River Grove); strong support for introduction of consistency ○ Feedback that a strategy for financial discount is required (i.e. ability to pay/sliding scale by age considering the older OA may have greater financial needs)	The age definition of an older adult engaged in recreation programs and opportunities should be confirmed as being 55 years of age and above. This age definition should be consistently applied to all programs, policies and services administered throughout the Recreation Services Division.
○ Strong Support for low cost/no cost and types of accessible programming (i.e. Gentle Fitness; Yoga; Aquatic Opportunities) ○ Feedback that there is limited Newcomers exposure and a need to expand marketing/promotion to a variety of older adult populations who are unaware of Recreation's programs and services	Enhance inclusiveness and social connectedness through program delivery targeted to persons 55 years of age and over: ○ Leverage sponsorship/grants (i.e. investigate opportunity to offer low to no cost opportunity through sponsorship) ○ Ensure a balance of programs is being offered in conjunction with Older Adult Clubs/providers that are of interest to a variety of older adult populations (including but not limited to newcomers, indigenous persons, LGBTQ+ community, isolated seniors and diverse/marginalized groups)
○ Discussions surrounding a required review of Programming Services - not limited to Social and Recreational but also Educational Services (i.e. Lifelong Learning, Computer Courses etc.) ○ Request to continue to review Partnerships (i.e. with the School Board to better utilize empty schools in summer/over capacity of Community Centres during same time period; with Culture Division for increased arts and culture programs etc.)	Work with community partners to better understand the penetration rate of older adults using recreation and related services in Mississauga, and to work collectively to respond to emerging trends and issues.

Allocation of Indoor Space for Older Adults	
Theme	Recommendation
○ Requested review of available space during Weekend, Evening to provide Older Adult clubs/providers with potentially free or low cost spaces ○ Review of Space Utilization (i.e. size of groups appropriate to rooms, outdoor spaces including free Parks permits in the summer, better use of concrete areas outside of the CC's) ○ Support for intergenerational spaces and programming – i.e. the creation of community multi-generational hubs ○ Need for Social Spaces, in particular Cafés and a review of healthy eating applications mentioned repeatedly at a number of the consultations	Engage all stakeholders in regards to the utilization planning with respect to rentals and programming within each service area employing a principles and knowledge-based approach (considering equity, demand, participation, preferences, ability, demographics, socio-economics, etc.).
○ Discussed significant need for space in the summer across the feedback sessions	Quantify demands and move the appropriate rentals and facility uses from community centres with pent up space demands to facilities with lower utilization within a given planning area, including relocation of City staff utilization (e.g. meetings, training, etc.). In doing so, the City should continue to work to accommodate summer-use requirements for older adults through the use of freed up space at facilities, utilization of facilities with capacity and the use of local and minor community centres.

Older Adult Service Delivery	
Theme	Recommendation
○ Improved communication regarding Older Adult programs and services; where/how to find information ○ Multiple requests across centres for more bus trips	Align all Older Adult Clubs and providers to the Community Group Registry Policy and revise the policy to provide clarity on program offerings and delivery.
○ Combine Older Adult Memberships under a universal plan – Older Adult groups/providers + Mississauga Seniors Centre + Active Adult Centre	Ensure the Recreation Division has the organizational structure to support the delivery of current and future older adult committees, programs, activities, processes and services.
○ Two very different and distinct groups with different needs exist within the Older Adult population: the more elderly Older Adults and Younger Older Adults, and this must be recognized (i.e. needs and wants of the 80+ year crowed are very different than those of the 55+ year crowed and a transition strategy should be implemented) ○ Support for increased assistance and communication with the CCOAC (particularly purposeful meetings extended to include all lines of business in the centre, including training for volunteer executives at the same time etc.)	Educate all staff and volunteer executives serving older adults about legislative and quality assurance methodologies and implement a quality assurance program for City of Mississauga Older Adult recreation services provision.

Older Adult Facility Design and Space Needs in Mississauga	
Theme	Recommendation
○ Inconsistent support for shared/integrated spaces within community centres: many individuals back the recommendation as it stands while others request a dedicated Older Adult Centre within their neighbourhood	In order to optimize recreation facility space, future additions to the supply of spaces supportive of older adult recreation programming and services should come in the form of shared and/or integrated spaces within community centres rather than a stand-alone centre dedicated exclusively to older adults. At centres that are not being redeveloped, catered spaces for Older Adult use will be incorporated as appropriate.
○ Need for flexible spaces to accommodate different sized Older Adult groups and activities was often discussed (ie. not only large rooms but having dividers, small rooms available etc); groups require storage space ○ Support for redevelopment of new centres was discussed (multiple requests for walking tracks) but also heard demands to ensure that existing facilities are maintained	Update design standards for recreation facility development/redevelopment projects to reflect the needs of older adults through elements such as (but not limited to) comfort, accessibility, and socio-demographic needs.
○ A need for accessibility requirements were echoed across the feedback sessions – need for reliable transit (availability of routes especially on weekends, accessibility to front door – both by transit and accessibly parking); automatic door openers on all doors etc.	As accessibility will be a fundamental influence in design, a coordinated approach with transportation services including MiWay, handicap parking locations, drop off lanes to offer transit to (or as close as possible to) the front door of community centres should be undertaken at the time when community centres are designed and/or redeveloped.

Appendix F Community Centre Room Usage Data

Major Community Centre Room Usage Throughout the Day, Weekdays September through June

Weekday Early Morning between 6:00am and 9:00am

Service Area	1		2		3	4		5		6		
MAJOR Community Centre	Meadow-vale	Erin Meadows	River-grove	Frank McKechnie	Malton	South Common	Huron Park	Mississauga Valley	Burnham-thorpe	Clarkson	Carmen Corbasson	M.S.C.
Hours Available for Use (All Rooms)	1,900	2,700	2,200	2,200	2,600	4,500	1,900	5,600	2,800	1,300	2,000	3,800
Total Hours Booked	75	10	400	450	1,400	100	600	600	80	50	50	100
Unused Hours	1,825	2,690	1,800	1,750	1,200	4,400	1,300	5,000	2,720	1,250	1,950	3,700
Utilization Rate	4%	0%	18%	20%	54%	2%	32%	11%	3%	4%	3%	3%

Weekday Mid-Morning between 9:00pm and 12:30pm

Service Area	1		2		3	4		5		6		
MAJOR Community Centre	Meadow-vale	Erin Meadows	River-grove	Frank McKechnie	Malton	South Common	Huron Park	Mississauga Valley	Burnham-thorpe	Clarkson	Carmen Corbasson	M.S.C.
Hours Available for Use (All Rooms)	2,100	2,800	2,500	2,500	3,000	5,300	3,100	6,500	3,300	1,500	2,300	4,400
Total Hours Booked	1,500	900	1,900	2,300	1,700	2,600	3,100	2,800	1,500	800	900	2,400
Unused Hours	600	1,900	600	200	1,300	2,700	0	3,700	1,800	700	1,400	2,000
Utilization Rate	71%	32%	76%	92%	57%	49%	100%	43%	45%	53%	39%	55%

Weekday Afternoon between 12:30pm and 4:30pm

Service Area	1		2		3	4		5		6		
MAJOR Community Centre	Meadow-vale	Erin Meadows	River-grove	Frank McKechnie	Malton	South Common	Huron Park	Mississauga Valley	Burnham-thorpe	Clarkson	Carmen Corbasson	M.S.C.
Hours Available for Use (All Rooms)	2,100	1,400	2,900	2,900	2,400	6,000	3,400	7,500	3,700	1,700	2,600	5,200
Total Hours Booked	2,100	600	2,300	2,500	2,300	2,400	3,400	3,200	2,000	700	600	3,600
Unused Hours	0	800	600	400	100	3,600	0	4,300	1,700	1,000	2,000	1,600
Utilization Rate	100%	43%	79%	86%	96%	40%	100%	43%	54%	41%	23%	69%

Weekday Early Evening between 4:30pm and 6:30pm

Service Area	1		2		3	4		5		6		
MAJOR Community Centre	Meadow-vale	Erin Meadows	River-grove	Frank McKechnie	Malton	South Common	Huron Park	Mississauga Valley	Burnham-thorpe	Clarkson	Carmen Corbasson	M.S.C.
Hours Available for Use (All Rooms)	1,300	1,800	1,400	1,400	1,700	3,000	1,300	3,700	1,900	900	1,300	2,600
Total Hours Booked	900	500	700	900	800	500	1,000	1,100	600	300	400	100
Unused Hours	400	1,300	700	500	900	2,500	300	2,600	1,300	600	900	2,500
Utilization Rate	69%	28%	50%	64%	47%	17%	77%	30%	32%	33%	31%	4%

Weekday Later Evening between 6:30pm and 10:00pm

Service Area	1		2		3	4		5		6		
MAJOR Community Centre	Meadow-vale	Erin Meadows	River-grove	Frank McKechnie	Malton	South Common	Huron Park	Mississauga Valley	Burnham-thorpe	Clarkson	Carmen Corbasson	M.S.C.
Hours Available for Use (All Rooms)	2,100	3,200	2,500	2,500	3,000	5,300	2,200	6,500	3,300	1,500	2,300	4,400
Total Hours Booked	1,800	1,300	1,400	1,500	1,000	1,600	1,600	2,200	2,200	1,000	1,000	1,100
Unused Hours	300	1,900	1,100	1,000	2,000	3,700	600	4,300	1,100	500	1,300	3,300
Utilization Rate	86%	41%	56%	60%	33%	30%	73%	34%	67%	67%	43%	25%

Total UNUSED HOURS by Service Area	11,715	8,650	5,500	19,100	28,520	11,600
TOTAL NUMBER OF UNUSED WEEKDAY HOURS AT MAJOR COMMUNITY CENTRES CITY-WIDE	**85,800**					

Note: available and booked hours have been rounded to the nearest 100

Minor Community Centre Room Usage Throughout the Day, Weekdays September through June

Weekday Early Morning between 6:00am and 9:00am

Service Area	1	2	3	4	5	6	Totals
Hours Available for Use (All Rooms)	4,100	2,300	1,300	1,300	4,300	10,600	23,900
Total Hours Booked	33	34	48	10	70	800	995
Unused Hours	4,067	2,266	1,252	1,290	4,230	9,800	22,905
Utilization Rate	1%	1%	4%	1%	2%	8%	4%

Weekday Mid-Morning between 9:00am and 12:00pm

Service Area	1	2	3	4	5	6	Totals
Hours Available for Use (All Rooms)	4,300	2,300	1,500	1,500	5,000	4,300	18,900
Total Hours Booked	900	800	200	300	300	260	2,760
Unused Hours	3,400	1,500	1,300	1,200	4,700	4,040	16,140
Utilization Rate	21%	35%	13%	20%	6%	6%	15%

Weekday Afternoon between 12:30pm and 4:30pm

Service Area	1	2	3	4	5	6	Totals
Hours Available for Use (All Rooms)	4,100	2,900	1,700	1,700	5,700	4,900	21,000
Total Hours Booked	1,200	900	200	100	800	200	3,400
Unused Hours	2,900	2,000	1,500	1,600	4,900	4,700	17,600
Utilization Rate	29%	31%	12%	6%	14%	4%	16%

Weekday Early Evening between 4:30pm and 6:30pm

Service Area	1	2	3	4	5	6	Totals
Hours Available for Use (All Rooms)	2,700	1,500	900	900	2,900	2,400	11,300
Total Hours Booked	500	500	100	70	300	200	1,670
Unused Hours	2,200	1,000	800	830	2,600	2,200	9,630
Utilization Rate	19%	33%	11%	8%	10%	8%	15%

Weekday Later Evening between 6:30pm and 10:00pm

Service Area	1	2	3	4	5	6	Totals
Hours Available for Use (All Rooms)	4,800	2,700	1,500	1,500	5,000	4,300	19,800
Total Hours Booked	2,200	1,300	300	300	1,500	1,700	7,300
Unused Hours	2,600	1,400	1,200	1,200	3,500	2,600	12,500
Utilization Rate	46%	48%	20%	20%	30%	40%	37%

TOTAL NUMBER OF UNUSED WEEKDAY HOURS AT MINOR COMMUNITY CENTRES CITY-WIDE	**78,800 hours**

Note: available and booked hours have been rounded to the nearest 100

Service Area 1 Minor Community Centres: Churchill Meadows Activity Centre, Meadowvale 4 Rinks, Streetsville Kinsmen Hall
Service Area 2 Minor Community Centres: Courtneypark, Meadowvale Village Hall
Service Area 3 Minor Community Centres: Malton Hall, Paul Coffey Arena
Service Area 4 Minor Community Centres: Erin Mills Twin Arena
Service Area 5 Minor Community Centres: Iceland Mississauga, Mississauga SportZone, Tomken Twin Arena
Service Area 6 Minor Community Centres: Clarke Hall, Lorne Park Hall, Port Credit Memorial Arena

MISSISSAUGA

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 2019/06/10

To: Chair and Members of General Committee

From: Geoff Wright, P. Eng, MBA, Commissioner of Transportation and Works

Originator's files: MG.23.REP

Meeting date: 2019/06/26

Subject
Hurontario Light Rail Transit Project Update and Negotiating Project Agreements with Metrolinx

Recommendation
1. That the report titled "Hurontario Light Rail Transit Project Update and Negotiating Project Agreements with Metrolinx" dated June 10, 2019 from the Commissioner of Transportation and Works be received**.**

2. That the City Manager and/or designate be authorized to negotiate with Metrolinx on agreements that outline roles, responsibilities, permits/approvals and funding related to the construction of the HuLRT Project and report back to Council.

3. That the City Clerk be directed to forward a copy of this report to Metrolinx and the City of Brampton.

Report Highlights
- The City of Mississauga has been working with Metrolinx on the development of the procurement documents for the Hurontario Light Rail Transit (HuLRT) Project and has representation on the conformance and technical evaluation review teams. Final bid proposals have been received and Metrolinx will be seeking provincial approvals to award the HuLRT Project by late Summer, 2019.
- The final scope includes changes announced by Metrolinx such as: the removal of the downtown loop and the stops proposed on Duke of York and the Exchange; deferring the pedestrian bridge connection at Cooksville GO Station; and changes to streetscaping and the proposed stop hierarchy development.
- Metrolinx intends to have HuLRT Project agreements in place with the Region and municipal partners for both the construction period and the full 30-year concession period prior to the final project award. This will require Council endorsement of negotiated HuLRT Project agreements by early September 2019. In addition, a Service Level

Agreement will also be required between the City of Mississauga and the City of Brampton.

Background

On April 21, 2015, the Ontario government announced a funding commitment for the Hurontario Light Rail Transit (HuLRT) Project. Metrolinx is managing the procurement and implementation of this project along with Infrastructure Ontario through their Alternative Financing and Procurement model. This procurement will include the Design, Build, Funding, Maintenance and Operations of the light rail system for a 30 year concession period. Metrolinx established a project team and identified detailed scope and performance requirements for the project. Furthermore, Metrolinx has identified that they will ultimately retain ownership and control of the project assets. As per the approved Memorandum's of Understanding developed for the procurement process, the Region of Peel and the Cities of Brampton and Mississauga are active partners in the HuLRT Project development.

The previous updates were provided to Council on May 23, 2018 through the report entitled, "Hurontario Light Rail Transit Project Update: Operations and Maintenance Responsibilities", dated May 8, 2018, from the Commissioner of Transportation and Works and to General Committee on May 30, 2018 through the report entitled "Hurontario Light Rail Transit Communications Update", dated May 8, 2018 from the Commissioner of Transportation and Works. The Council report outlined Metrolinx's position on overall HuLRT Project costs with Metrolinx committing to providing $1.4B in capital costs in addition to ongoing system lifecycle costs, while the municipalities would be responsible for funding operations and maintenance including managing day-to-day oversight, fare enforcement, safety/security of passengers, customer service and marketing. The Council report authorized negotiations with Metrolinx and the City of Brampton on agreements for the operation and maintenance of the HuLRT. The Cities of Mississauga and Brampton will be required to enter into an agreement with Metrolinx with respect to HuLRT maintenance and operations prior to the final project procurement award.

On March 21, 2019, Metrolinx released a statement that "In order to offer riders a more convenient route and alleviate potential budget pressures on the Hurontario Light Rail Transit project, changes to the scope of the project, recommended by Metrolinx, have been approved by the Government of Ontario. These changes include:

- Removing the Mississauga city centre loop and creating a direct in-out access route from Hurontario to the Rathburn stop, located next to the Miway Transit Terminal.
- Deferring the pedestrian bridge at the Cooksville stop to be included in a future Transit Oriented Development between the stop and the GO station.
- Changes to streetscaping along the corridor."

As active utility relocation works are currently underway in the corridor and the Metrolinx procurement process is nearing completion, this report is intended to provide a summary of major activities, changes and flag impending decision areas that will need to be addressed.

Comments

The Metrolinx HuLRT procurement process is nearing completion with two final technical bid proposals being received on April 18th, which was followed by a conformance and technical evaluation review period completed at the end of May 2019.

The City of Mississauga has representatives involved in the conformance and technical bid evaluation teams. The financial bids were subsequently received on May 23, 2019.

With the technical and financial review concluded, Metrolinx will negotiate final details with the highest ranked bid team prior to seeking Provincial approvals, with the project award expected to occur by late Summer, 2019.

Metrolinx also intends to have agreements in place with the Region and municipal partners for both the construction period and the full 30-year concession period prior to the final project award. While the procurement process is being finalized and the municipal agreements are being developed, various ongoing activities have continued:

Early Works

Preparatory construction along the Hurontario Street corridor began in late 2017 in an effort to conduct utility work in advance of major construction. That work conducted for utility companies has created impacts for commuters, also acting as a precursor for impacts during major construction.

Metrolinx has been sending out information about early works locations, timelines and potential impacts through its social media channels. In addition, notices have been sent to residents and businesses within 500m of the construction area.

As of May 31, 2019, 22 preparatory construction projects have been completed, 5 are in progress and 19 remain to be completed. The intention is to complete these remaining early works by Spring, 2020.

Community Outreach

In 2018, Metrolinx-led community outreach efforts enabled nearly 8,000 conversations with individuals about the project to answer questions, address concerns and continue to raise awareness. This occurred through a number of mediums:

- 2 Community Connector canvasses, door-to-door visits to businesses and residents directly on Hurontario Street by a team of trained individuals who provide information about the project
- Participation in more than 30 community events, including a number at Celebration Square
- Conducting more than 40 information sessions at office towers, apartment buildings, libraries, community centres and transit facilities
- Holding 20 open houses or Corridor Committee meetings, which are held quarterly with stakeholders in each of the four wards along the corridor

During the first five months of 2019, community outreach has continued to build in the lead up to major construction, which is expected to begin later this year. Events early in 2019 were limited until scope changes were formally announced by Metrolinx. However, there was an increase in awareness about the project following the announcement in March, 2019. The top questions continue to be related to construction schedule, impacts during construction, and fare integration. Community outreach activities will increase through the summer at a number of events and information sessions as the procurement process wraps up in the coming months.

This summer, Metrolinx is opening one of two Hurontario LRT Community Offices in Mississauga – the other will be in Brampton – for the duration of the project. The Mississauga office, staffed by Metrolinx community relations team members, is located at 3024 Hurontario under the Cooksville Library. This office will be open to individuals who have questions about the project and will also hold meetings and seminars related to the project.

Corridor Committees, established for Mississauga South, Mississauga Cooksville, Mississauga Downtown and Mississauga North, will continue to be held quarterly, or as needed, to ensure residents, businesses and stakeholders in proximity to the Hurontario corridor are informed. The committees are to provide information and context to Metrolinx and the City of Mississauga in a clear, accessible and timely manner. It is not within the scope of the Committees to approve or refuse project design plans or to make policy decisions.

Social media is the main channel to inform residents about ongoing preparatory construction in various locations and the potential impact on traffic, as well as an overview of the project. These efforts will increase leading up to and throughout construction. Individuals interested can sign up for a monthly e-newsletter from the project team.

Encroachments

To prepare for the construction of the Hurontario LRT, staff began the work in spring 2018 to ensure the future LRT route was clear of encroachments. Staff reached out to property owners and/or tenants located on the route to give them notice and the opportunity to collect items on City property ranging from signs to planters and other items without enforcing the City's by-law.

For encroachments that are not cleared from City-owned lands the City can enforce its Encroachment By-law 0057-2004 to ensure the removal of the encroachments prior to construction.

More than 110 encroachments were identified by staff. The great majority of property owners and/or tenants were cooperative and removed encroachments by the end of 2018. However, enforcement did issue subsequent notices to some property owners with a final deadline of May 3, 2019 to remove encroachments. By that deadline, 15 encroachments remain, including signs, walkways, benches, concrete barriers and submarine. Enforcement indicated that most are being responsive and cooperative, and will move items prior to construction. However, a few property owners have been non-responsive during the process, and the Encroachment By-law will be enforced prior to the start of construction, expected to begin later this year.

Property Acquisition

Currently there are property requirements identified from approximately 200 properties along the corridor in Mississauga for the HuLRT based on the Reference Concept Design. The property needed consists of portions of land from 135 privately owned properties with the balance comprising government owned land.

The majority of the land needed is strips for road widening, new sidewalks, multi-use trail, utilities and landscaping, etc. Possession of most property of this land is required in early 2020

A number of agreements have been achieved with owners however in order to ensure project timelines are met, it has been necessary to initiate expropriation proceedings against all of the properties where amicable agreements could not be achieved.

Expropriation proceedings have commenced for the HuLRT Project and typically take approximately 12 to 14 months before property possession is achieved. This is necessary to ensure project timelines are met as required by the Alternative Financing and Procurement Process.

Registration of Expropriation Plans by Metrolinx is anticipated to occur in stages from Summer to Fall of 2019, following the signing of Certificates of Approval by the Minister of Transportation. Statutory offers of compensation (Section 25 Offers) will be served within 90 days following registration of the plan in accordance with the Expropriations Act.

Expropriation does not preclude ongoing property negotiations with affected owners in efforts to achieve mutual agreements or settlements of compensation for the land required. Metrolinx is committed to providing fair and reasonable compensation for all property rights that are required.

Lands required from the City of Mississauga including an easement for the HuLRT Alignment and ancillary structures will be subject of separate reporting.

Development Applications

The HuLRT Project was envisioned to help support development requirements along the corridor as established in our Official Plan. Metrolinx has requested and is being circulated on all development application in the vicinity of the HuLRT Project alignment to ensure coordination with the design and construction. Focus areas include adjoining boulevard works and servicing requirements.

Project Scope Changes

Metrolinx has incorporated the scope changes identified from the provincial announcement in March 2019 into the procurement and the revised scope will also result in reduced municipal contributions for previously approved Additional Municipal Infrastructure and Corridor Enhancement commitments. As per the provincial announcement, this includes the removal of the Mississauga city centre loop and two stations, creating a direct in-out access route from Hurontario to the Rathburn stop, located next to the Miway Transit Terminal. However, language has been included in the agreement to enable this deferred segment to be re-introduced at a later stage through scope changes. The proposed infrastructure change will allow for a single northbound/southbound service to operate in the corridor but will limit the maximum operating frequencies/headway available.

The stop proposed at Highway 407 has been deferred and the stop hierarchy and associated stop design have been reduced. The pedestrian bridge at the Cooksville stop to connect to the GO Station has also been deferred and is to be included in a future Transit Oriented Development between the stop and the GO station.

Municipal Capital Contributions

The revised project scope in the final procurement award will result in reduced municipal contributions for previously approved Additional Municipal Infrastructure and Corridor Enhancements.

The City had previously committed Additional Municipal Infrastructure funding of $26,307,000 for items that would benefit from the coordinated reconstruction of the corridor that included storm sewer upgrades/replacements, uninterrupted power supply backup at signalized intersections, and variable message signs to provide coordination with Miway services. Many of these items are still anticipated for the final corridor reconstruction.

In addition, the City had also committed $26,607,400 for Corridor Enhancements to elevate elements of the base project scope being provided by Metrolinx. These items included elevated stop design through a stop hierarchy, Duke of York streetscape upgrades, utility relocated to underground locations and boulevard/bus bay/ transit shelter treatments on Burnhamthorpe Road, pedestrian scale lighting in the downtown and selected bike signal locations.

Many of the identified Corridor Enhancements are no longer included within the procurement award and the municipal funding contribution levels will need to be revised. The revised municipal capital funding commitments will be brought back to Council with the identified system operations and maintenance funding commitment in September 2019.

Project Agreements

Metrolinx plans to complete a Project Agreement with the successful consortium (ProjectCo) by September 2019 and also intends to have HuLRT Project agreements in place with the Region and municipal partners covering the construction period and the full 30-year concession period at the same time, prior to the final project award.

This ambitious schedule will require Council endorsement of negotiated agreements between Metrolinx and municipalities that includes details on associated operations and maintenance costs by September, 2019. In addition, a service level agreement between municipalities will also be required at that time. Given the limited amount of time, Metrolinx has indicated that it may seek to reach interim agreements with the partner municipalities in order to facilitate the awarding of the contract in September. These interim agreements would allow for more detailed discussions and agreements to be developed during the period following the contract award.

In general, ProjectCo will be responsible for constructing the HuLRT Project on behalf of Metrolinx. Metrolinx has previously requested that the municipalities waive all associated permit fees in exchange for funding dedicated municipal staff resources to facilitate the construction and inspections. The details have yet to be finalized and will need to be confirmed for Council approvals. Metrolinx has been funding dedicated municipal staffing during the procurement process as per the established Memorandum of Understanding.

The municipalities will be required to provide easements for the transit alignment lands. The agreements will also need to address the rebuilt municipal boulevards and transfer of properties acquired by Metrolinx for the project construction into the municipal road right-of-way.

Staff have been working to review internal processes such as the use of Road Occupancy Permits and the Public Utilities Coordination Committee to help facilitate construction while protecting established interests. As per previous Council reports, extended construction hours

are anticipated and an approved process for providing an exemption to the noise by-law for extended construction hours is in place.

When the HuLRT system begins operations, Metrolinx and ProjectCo will be responsible for undertaking the operations and maintenance of the system and HuLRT infrastructure. Metrolinx will fund the capital infrastructure and lifecycle costs, and manage their contractual responsibilities with ProjectCo.

The municipalities are expected to receive the farebox/advertising revenues and be responsible for funding the ongoing (30-year) operation and maintenance costs identified in the award. In addition, there are a range of optional services/responsibilities that have been bundled into a single Provisional Bid line item for ProjectCo. These items include fare enforcement, safety/security of passenger safety, incident management, customer service and communications, and lost-and-found services.

The municipalities will need to determine if the Provisional Bid for these items provides value and serves their needs effectively over the duration of the concession period or if these tasks should be undertaken internally or by other third parties. This internal review work is underway as the municipalities are working together to understand the scope, processes and resources required for undertaking these tasks. The internal review will be used to assess the Provisional bid submission and explore opportunities before reporting back to Council in September, 2019.

There are also tasks not currently identified such as marketing, branding and municipal day-to-day oversight that will also need to be jointly accounted for by the municipalities. The municipalities are working together to understand the scope, processes and resources required for undertaking these tasks. In addition, there will also be increased financial pressures on existing municipal budgets for Miway services during construction and for maintaining the city infrastructure based upon the new roadway and boulevard design after the HuLRT construction.

The previously identified Council report of May 23, 2018 entitled, “Hurontario Light Rail Transit Project Update: Operations and Maintenance Responsibilities”, dated May 8, 2018, from the Commissioner of Transportation and Works provided authority to negotiate agreements covering HuLRT operations and maintenance subject to reporting back to Council for signing authority. However, Metrolinx has confirmed that there will now be separate agreements or Memorandum of Understanding/interim agreements required covering the construction period and subsequent concession period. Therefore, additional authority will be required to negotiate with Metrolinx for the construction agreements. These agreements will be subject to Council approval.

The municipalities have been circulated on a high level outline of an agreement structure in October 2018 and have recently received a first draft of the proposed construction agreement from Metrolinx to begin reviewing. This is anticipated to be a complex agreement structure as the successful consortium will have a direct contractual relationship with Metrolinx and the

municipalities will need to work effectively with Metrolinx to ensure their areas of interest and financial accountability are being addressed. In addition, the first draft of the separate agreement or Memorandum of Understanding/interim agreement covering the concession period with processes to ensure effective change management over that time are still outstanding.

The Service Level Agreement between the City of Mississauga and the City of Brampton will also be required to address policy coordination and revenue/cost responsibilities along with dispute resolution processes.

An In-Camera Council session subject to solicitor-client privilege is proposed to provide legal advice and seek direction from Council in respect of the negotiation process for the identified agreements.

Financial Impact

There are no financial impacts resulting from the recommendations in this report. However, the Metrolinx-City of Mississauga agreement(s) for the construction and 30-year concession period of the HuLRT will have financial impacts. At this time, there will be reductions in the amount of Additional Municipal Infrastructure and Corridor Enhancement funding as previously identified for this project due to the Metrolinx scope changes. Details on the extent of those reductions and the full impacts of the agreement(s) proposed with Metrolinx for delivering the HuLRT Project will be subject to a future report planned for September 2019.

Conclusion

Metrolinx is nearing the end of the HuLRT procurement process and plans to complete their reviews and approvals in order to make an award to the successful consortium in September 2019. Metrolinx also intends to have agreements in place with the Region and municipal partners covering the construction period and the 30-year concession period at the same time, prior to the final project award.

In general, Metrolinx through their procurement will responsible for the capital construction and lifecycle costs associated with the HuLRT Project, while the municipalities through agreements with Metrolinx would receive any system revenues and be responsible for funding operations and maintenance elements of the award. In addition, day-to-day oversight, fare enforcement, safety/security of passengers, customer service, branding and marketing would also be municipal responsibilities. A Service Level Agreement between both respective municipalities will also be required. There will also be increased financial pressures on existing municipal budgets for Miway services during construction and for maintaining the city infrastructure based upon the new roadway and boulevard design after the HuLRT construction.

The ambitious schedule will require Council endorsement in September 2019 of:

- An agreement with Metrolinx for the construction of the HuLRT as identified in the final HuLRT Project Agreement
- An agreement or Memorandum of Understanding/interim agreement with Metrolinx for the provision of the operations and maintenance of the HuLRT during the concession period along with a municipal commitment for funding these services; and
- A Service Level Agreement between the City of Mississauga and the City of Brampton for the joint municipal commitments required for the HuLRT Project.

Geoff Wright, P. Eng., MBA, Commissioner of Transportation and Works

Prepared by: Matthew Williams, HLRT Project

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 6/3/2019

To: Chair and Members of General Committee

From: Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer

Originator's files:

Meeting date: 6/26/2019

Subject
5 Year Energy Conservation Plan (2019 - 2023)

Recommendation
1. That the Corporate Report entitled, "5 Year Energy Conservation Plan (2019 – 2023)", dated June 3rd, 2019 from the Commissioner of Corporate Services and Chief Financial Officer, be received.
2. That the 5 Year Energy Conservation Plan (2019 – 2023) attached in Appendix 1 be published and made available to the public on the City's website in accordance with the Ontario Regulation 507/18 under the Electricity Act 1998.

Report Highlights
- Under the Ontario Regulation 507/18 of the Electricity Act 1998, all broader public agencies including municipalities are requested to report annually on their energy consumption and greenhouse gas (GHG) emissions and to develop and implement energy Conservation and Demand Management (CDM) plans.
- The City of Mississauga has been publically reporting energy consumption and GHG emissions, and developed and implemented a CDM plan since 2014 when the same requirements were mandated for all public agencies under the Ontario Regulation 397/11 in the Green Energy Act.
- Under the new 5 Year Energy Conservation Plan (2019 – 2023), the City is targeting a 5% reduction in energy consumption and GHG emissions by 2023 compared to 2018, and has planned to implement a number of innovative projects and pilots, operation optimization initiatives for ice plants and pools, electrical upgrades, renewable energy generation, and energy management and fault detection system which will use real time data and analytics to identify anomalies and prevent energy waste.
- The targets and planned projects and initiatives in the new 5 Year Energy Conservation Plan (2019 – 2023) have been aligned with the forthcoming Mississauga Climate Change Action Plan.

- It is estimated that the planned projects and initiatives will reduce energy consumption by 5% by 2023 compared to 2018 which would amount to a total avoided cost of $1,352,750 in utility costs, subject to annual project budget approvals under the Improve Green category.

Background

In 2009, the Ministry of Energy introduced the Green Energy Act in order to expand renewable energy production and encourage energy conservation. The purpose of the Green Energy Act was threefold; foster growth of renewable energy projects, ensure public sector conserves energy and reports usage annually, and energy efficiency requirements are adhered for appliances and products. One of the regulations under the Act, the Ontario Regulation 397/11, required all public agencies:

- To prepare, implement, and publish on its website an Energy Conservation and Demand Management (CDM) plan every five (5) years starting July 1st, 2014;
- To report annual energy consumption and greenhouse gas (GHG) emissions data to the Ontario Ministry of Energy through their Broader Public Sector (BPS) Portal every year starting July 1, 2013.

After the new Government of Ontario came on-board in 2018, the Ontario Ministry of Energy, Northern Development and Mines repealed the Green Energy Act and its regulations; however, some of the provisions in the Green Energy Act, including the Ontario Regulation 397/11 were re-enacted under the Electricity Act 1998. The Ontario Regulation 507/18, which came into force on January 1, 2019, includes the same requirements as Regulation 397/11, regarding annual reporting on energy consumption and GHG emissions and the development of five-year CDM plans starting July 1, 2019. Also, all public agencies must make their CDM plans publically available on their websites and in hard copy.

Present Status

In 2014, the City developed the 5 Year Energy Management Plan (2014 – 2018) which targeted 1% reduction in Energy Use Intensity (EUI) and Greenhouse Gas (GHG) emissions each year over the five (5) year period. Further, the City has been reporting annual energy consumption and greenhouse gas emissions data for all its heated and conditioned buildings to the Ontario Ministry of Energy through their Broader Public Sector (BPS) Portal every year since 2013.

Numerous energy conservation projects and initiatives were implemented over the 2014 – 2018 period and as a result the City was able to achieve great results compared to the baseline of 2013, which does not account for new buildings or growth in buildings size since 2013. The results are summarized below:

- Energy Use Intensity and GHG Emissions dropped by 9.3% and 8.1% respectively
- A total utility costs of $1,306,550 were avoided

- A total incentives of $1,199,505 were received from utilities as a result of the savings achieved from the projects and initiatives

Further, the City has received the following awards and achievements during this period:

- Living City Energy Efficiency award for Mississauga City Hall for three years in a row (2016, 2017, 2018)
- Best Municipality/University/School/Hospital (MUSH) 1MW+ Customer award (2018)
- 2015 Town Hall Challenge award for Mississauga City Hall
- ENERGY STAR® certification for Mississauga City Hall (2018)

Comments

The new 5 Year Energy Conservation Plan (2019 – 2023) is built following the principles of ISO 50001 and is based on the Plan-Do-Check-Act continual improvement framework. The plan provides a systematic, data-driven and facts-based process, focused on constantly improving energy performance. According to the new plan, City staff:

- PLAN: Have set a target of 1% reduction in energy consumption and GHG emissions each year over the energy consumption of 2018. Planned a list of projects and initiatives in order to achieve the target.
- DO: Implement the planned energy conservation projects, operational and maintenance controls, ensure competence and consider energy performance in design and procurement.
- CHECK: Will utilize the real-time utility metering and sub-metering systems in larger facilities to track the performance of the projects and improvements.
- ACT: Will improve energy performance in the facilities further by taking actions to address nonconformities and continually drive energy performance.

City staff also ensured that the new 5 Year Energy Conservation Plan (2019 – 2023) aligned with the forthcoming Mississauga Climate Change Action Plan in the following ways:

- It will significantly contribute towards the proposed interim target of 25% reduction in corporate energy consumption below 2008 levels by 2030.
- The planned projects and initiatives in the plan will meet one of the supporting actions in the Climate Change Action Plan of developing a comprehensive retrofits program for City-owned buildings and properties to reduce greenhouse gas emissions and make them more resilient.

Subject to annual project budget approvals under the Improve Green category, Energy Management has planned for the following projects and initiatives in consultation with Divisional partners during the 2019 – 2023 period:

- Pool Heat Recovery System installation;
- Ice Plant Energy Efficiency: implementation of a robust ice plant controls and cold water ice resurfacing capabilities;
- Pool Dehumidification Efficiency Improvement: optimization of pool equipment and systems;

- Building Analytics and Fault Detection System: collects, manages, and analyzes data from various building systems for load profiling, facility benchmarking, asset performance tracking and fault detection;
- Energy Upgrades as part of the Lifecycle Replacements;
- Controls Upgrades to optimize equipment operation;
- Metering & Sub-metering to utilize real-time data for making smarter operation decisions;
- Lighting Upgrades to newer and efficient technologies with efficient controls to match occupancy and natural daylight;
- Increasing and promoting energy awareness through programs such as Operation Optimization;
- Analyzing opportunities for Renewable Energy Generation, wherever feasibly possible.

Financial Impact

Funding for implementing the planned projects under the plan will be requested through the Facilities and Property Management's annual capital budget request process. These projects will be submitted for approval under the Improve Green category since they improve the environment, reduce energy consumption, and encourage clean and healthy environment. The business case for the projects to be submitted each year would be prepared keeping in mind various factors, including the extent of design and engineering work required, grouping together similar types of work, disruption of programs within facilities, synchronization with other redevelopment projects as well as savings potential.

Subject to annual project budget approvals under the Improve Green category, it is estimated that the City will be able to achieve the following results over the 2019 – 2023 period:

- 5% reduction in energy consumption and 8.3% reduction in GHG emissions
- A total of $1,352,750 utility avoided costs

Conclusion

The 5 Year Energy Conservation Plan (2019 – 2023) attached in Appendix 1 has been prepared to meet the requirements of Ontario Regulation 507/18 under the Electricity Act 1998 and it is intended to be made available to the public on the City's website. The plan provides a summary of the previous plan's performance and describes the energy efficiency measures planned for the next 5 years (2019 – 2023) in order to achieve the set targets. The new plan is based on the Plan-Do-Check-Act continual improvement framework and incorporates energy management into existing organizational practices. Further, the targets and the planned projects and initiatives in the plan are aligned with the forthcoming Mississauga Climate Change Action Plan.

The plan requires the support and approval of the City's senior management, as per the Ontario Regulation 507/18 under the Electricity Act 1998. The plan is scheduled to be presented for approval from the City's Leadership Team on June 13th, 2019, after which it is being presented to Chair and Members of General Committee for information on June 26th, 2019.

Attachments

Appendix 1: 5 Year Energy Conservation Plan (2019 - 2023)

Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer

Prepared by: Sumeet Jhingan, Energy Management, Facilities & Property Management

MISSISSAUGA

CITY OF MISSISSAUGA

5-YEAR ENERGY CONSERVATION PLAN

2019 - 2023

EXECUTIVE SUMMARY

Since 2001, the City of Mississauga (the City) has implemented three successful Energy Conservation Plans, encompassing the electricity and natural gas consumption in City-owned and operated facilities. This new 5 Year Energy Conservation Plan (2019-2023) is now the fourth and builds on the successes of the previous plans. It targets a 1% reduction in energy use and greenhouse gas emissions (GHGs) per year for facilities, over the next five years.

THE OLD 5 YEAR ENERGY MANAGEMENT PLAN (2014-2019)

The City embarked on the plan by first planning, then requesting funding, and finally executing projects over this period. During the five (5) year period, the City was able to execute both capital-intensive projects such as Energy Upgrades for Lifecycle Replacements, Lighting Upgrades, Controls Upgrades etc. and low/no-cost improvements such as Operation Optimization. The executed projects over this period are shown on the next page.

As a result of these projects, the City was able to achieve incredible results over the 2014 – 2018 period, as summarized below:

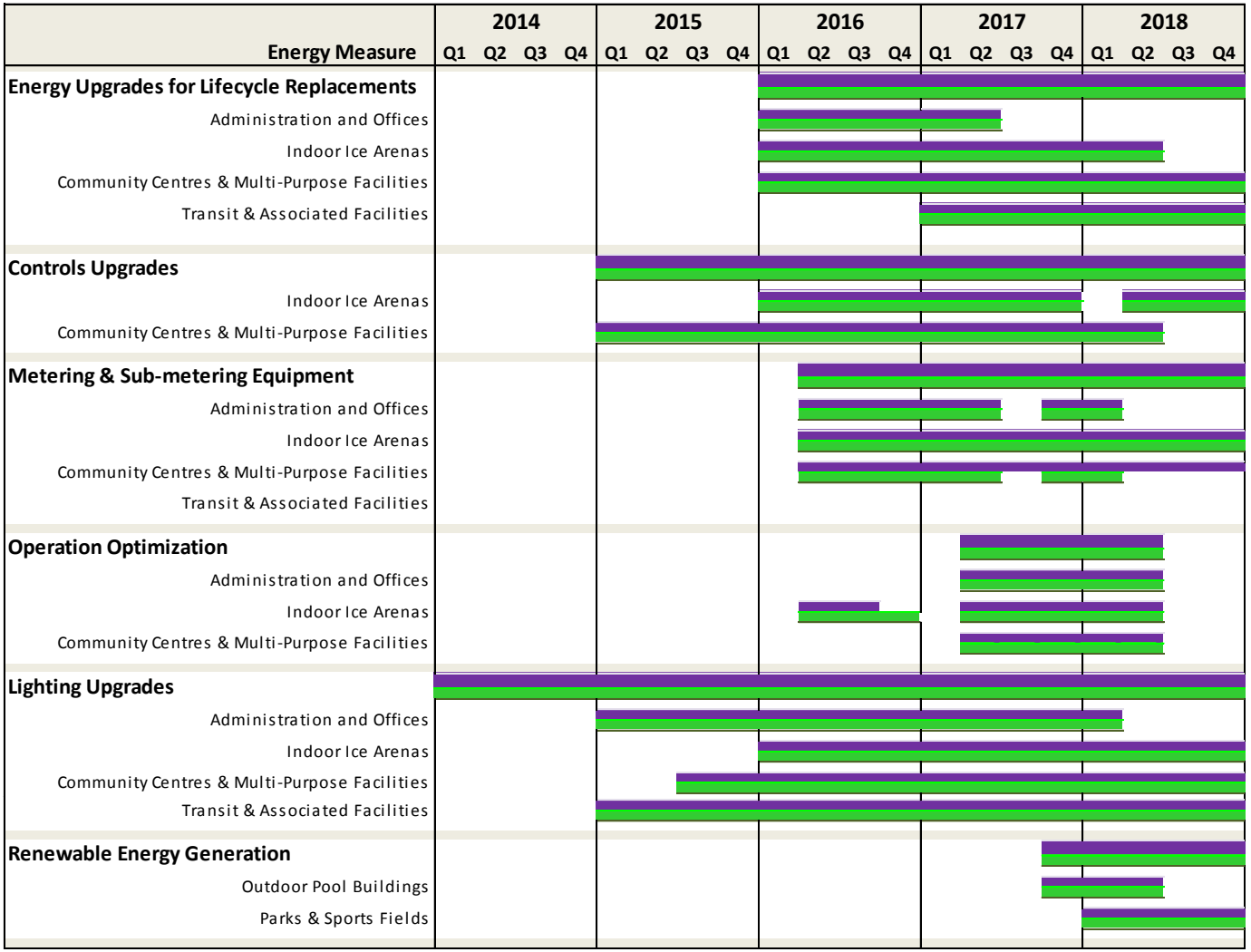
- Energy Use Intensity and GHG Emissions dropped by 9.3% and 8.1% respectively
- A total utility costs of $1,306,550 were avoided
- A total incentives of $1,199,505 were received from utilities as a result of the savings achieved from the projects and initiatives

The results showcase City's commitment and leadership in energy conservation and its continual actions towards a sustainable Mississauga

AWARDS AND ACHIEVEMENTS

- Living City Energy Efficiency award for Mississauga City Hall for three years in a row (2016, 2017, 2018)
- Best Municipality/University/School/Hospital (MUSH) 1MW+ Customer award
- 2015 Town Hall Challenge award for Mississauga City Hall
- ENERGY STAR® certification for Mississauga City Hall for 2018

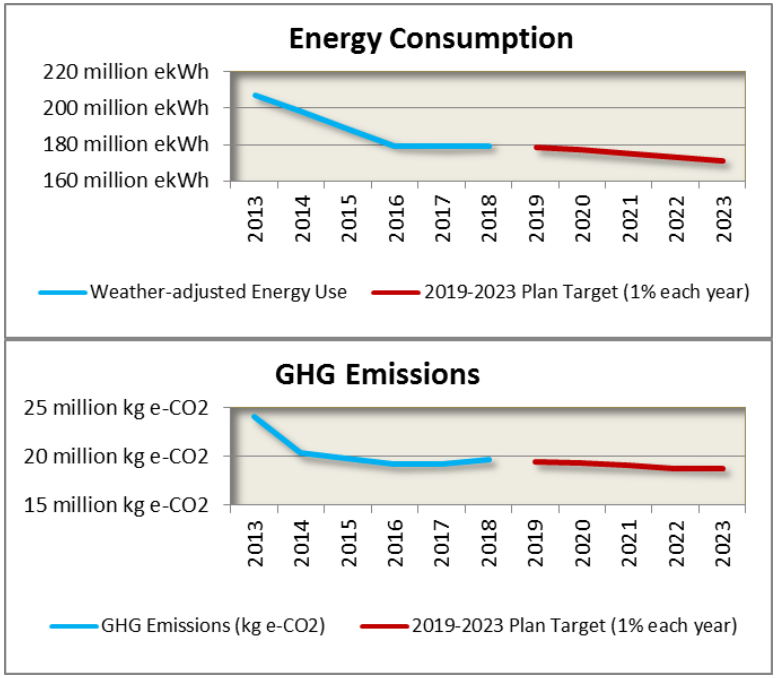
Energy Measure Implementation for City Facilities



THE NEW 5 YEAR ENERGY CONSERVATION PLAN (2019-2023)

The City will be following the principles of ISO 50001 and its Plan-Do-Check-Act continual improvement framework for the new 5 Year Energy Conservation Plan (2019-2023). City staff will:

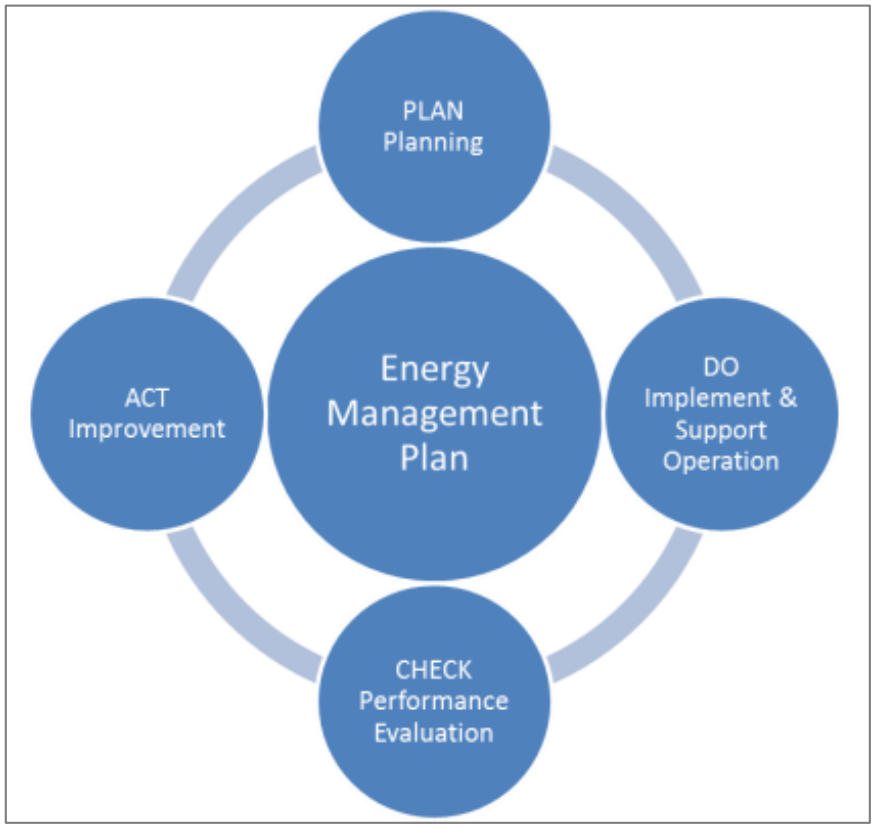
- PLAN: Have set a target of 1% reduction in energy consumption and greenhouse gas (GHG) emissions each year over the energy consumption of 2018. Planned a list of projects and initiatives in order to achieve the target.



- DO: Will request funding each year and execute the planned projects noted below during the five (5) period.

- CHECK: Will utilize the real-time utility metering and select sub-metering (eg: ice plant) systems in larger facilities to track the performance of the projects and improvements.

- ACT: Will improve energy performance in the facilities further by using the data from the real-time utility metering and select sub-metering (eg: ice plant) systems to continually drive energy performance

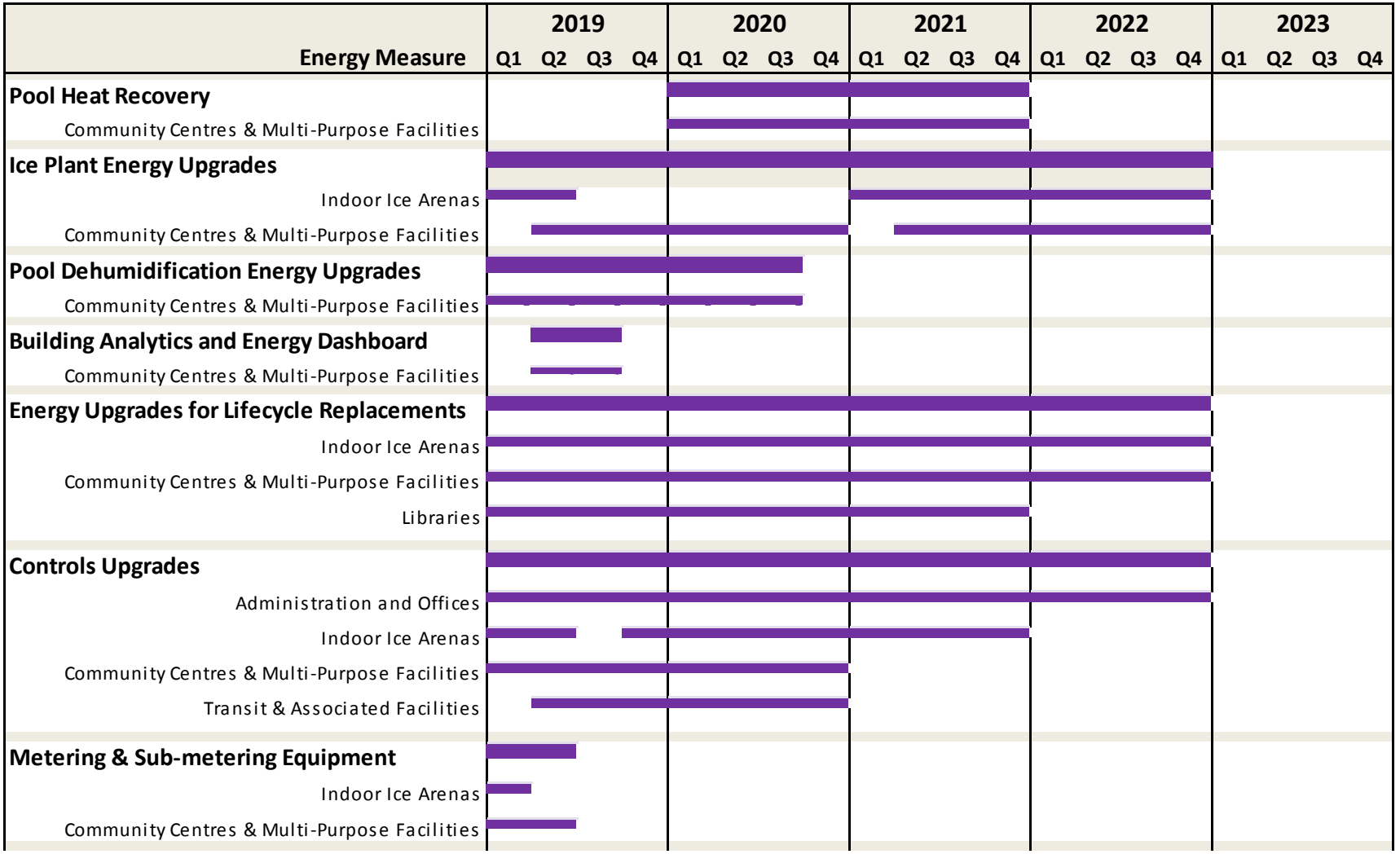


Under this plan, the City will meet its conservation targets by:

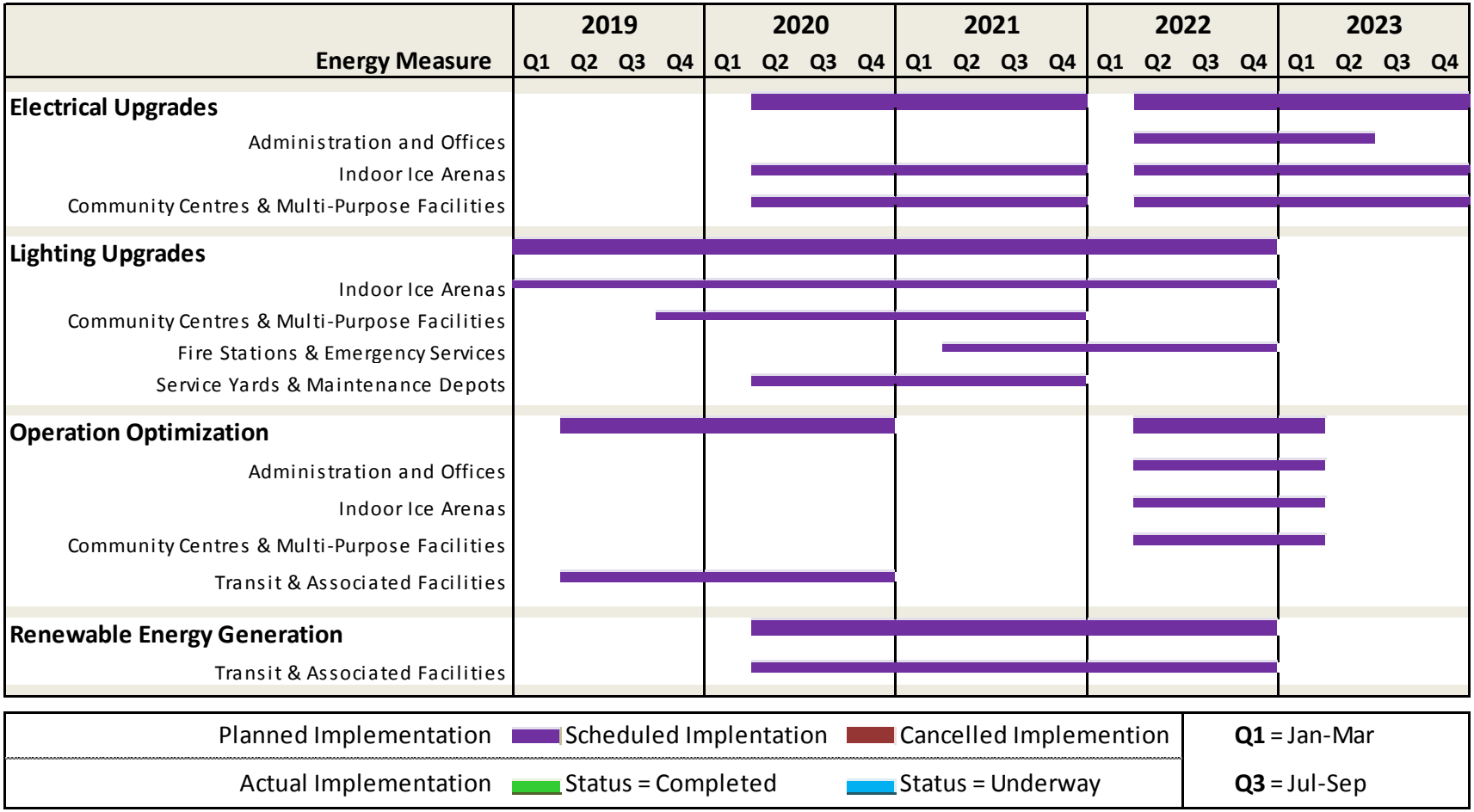
- Implementing **Pool Heat Recovery** to recover heat from pool drain and transfer to fresh water supply;
- Implementing **Ice Plant Energy Upgrades** that includes a robust ice plant controls and cold water ice resurfacing capabilities;
- Implementing **Pool Dehumidification Energy Upgrades** that includes optimized controls for the dehumidification equipment in the pool;
- Piloting an **Energy Management Information System** that collects, manages, and analyzes data from various building systems for load profiling, facility benchmarking, asset performance tracking, fault detection, and creating energy dashboard;
- Implementing **Energy Upgrades** as part of the **Lifecycle Replacements**;
- Implementing **Controls Upgrades** at facilities with building automation system to optimize equipment operation further;
- Installing **Metering & Sub-metering Equipment** to utilize real-time data for making smarter operational decisions;
- Implementing **Electrical Upgrades** like voltage regulation and power factor correction devices to reduce wastages in distribution;
- Implementing **Lighting Upgrades** to newer and efficient technologies, including efficient controls to match occupancy and natural daylight;
- Increasing and promoting energy awareness through programs such as **Operation Optimization**; and
- Analyzing opportunities for **Renewable Energy Generation**, wherever feasibly possible.

The new plan builds on a strong record of reducing energy consumption for positive social, financial, and environmental results. The implementation plan for this plan is shown on the next page.

Energy Measure Implementation for City Facilities



Energy Measure Implementation for City Facilities



I. TABLE OF CONTENTS

1.0 INTRODUCTION

The City of Mississauga (the City) is dedicated to finding new ways to conserve energy, and help reduce our electricity and fossil fuel-related emissions.

The new **5 Year Energy Conservation Plan (2019-2023)** is the third iteration of the plan, which was first created in 2009 and builds on the successes of two previous plans, created in 2009 and 2014.

1.1 VISION

To steward the collaborative effort with stakeholders creating a lasting legacy of a sustainable City of Mississauga.

1.2 MISSION

The Energy Management team is committed to consistently reduce utility consumption and costs by setting targets, measuring performance, and implementing best practices.

1.3 BACKGROUND

In 2009, the City introduced its first Energy Conservation Plan. New developments – like the Green Pillar of the City's Strategic Plan, the goal of being a net-zero carbon city, and the Province's *Green Energy Act, 2009* – necessitated a more aggressive approach compared to previous years.

The main objectives of each plan have been to identify energy and water saving opportunities that will lower utility costs, improve operational efficiency, and contribute to the City's overall Environmental Management Plan. Improved energy procurement in a deregulated market was another important objective.

1.4 ELECTRICITY ACT

The old **5 Year Energy Conservation Plan (2014-2019)** was developed, in part, in response to the requirements of Regulation 397/11 of the Green Energy Act. While the Green Energy Act has since been repealed, effective January 1, 2019, the requirements of the Regulation 397/11 have now been carried in the Electricity Act, under Regulation 507/18.

1.4.1 REGULATION 507/18

Under the Act, Ontario Regulation 507/18 requires broader public agencies – municipalities, municipal service boards, school boards, universities, colleges and hospitals – to:

- report on their energy consumption and greenhouse gas (GHG) emissions annually beginning in 2019; and
- to develop and implement energy Conservation and Demand Management (CDM) plans starting in 2019.

The regulation requires that the public agency develop, and make public, the CDM plan by July 1st, 2019. Public agencies must also update the plan every 5 years beginning in 2019.

Information:

More information on Regulation 507/18, including a copy of the regulation, can be found at:
https://www.ontario.ca/laws/regulation/180507

1.5 2019 PLAN AND COMMITMENT

The new **5 Year Energy Conservation Plan (2019-2023)** is the third iteration of the plan and builds on the old **Plan (2014-2018)**. Similar to the previous plan, this plan will target a 1% reduction in energy use and greenhouse gas emissions (GHGs) per year, over the next five years by

The plan includes the following:

- The City's vision and mission relating to energy efficiency and GHG emissions.
- A summary of the goals and performance of the old plan, covering 2014 to 2018
- Establishment of the targets and baseline of the new plan, covering 2019 to 2023
- Baseline Energy Use breakdown for city-wide, facility group types, and each facility
- A summary of the implementation plan to achieve the goals of the new plan, covering 2019 to 2023
- A summary of the method to measure, verify, and report on savings
- An outline of the team responsible for energy efficiency and energy procurement for the City of Mississauga.

1.6 LINK TO OTHER PLANS AND POLICIES

The City has already put plans and policies in motion to place sustainability and climate change mitigation and adaptation as a priority. It is these plans and policies that the **5 Year Energy Conservation Plan (2019-2023)** takes its vision and goals.

1.6.1 STRATEGIC PLAN

The Strategic Plan is Mississauga's vision document, which since 2009, has set priorities and shaped decision-making for the City. The five Strategic Pillars for Change are Move, Belong, Connect, Prosper and Green. The Green pillar provides the long-term goal of a "zero carbon" City.

1.6.2 LIVING GREEN MASTER PLAN

The Living Green Master Plan (LGMP) is Mississauga's first environmental master plan. It prioritizes City policies and programs into 49 actions, over 10 years, to meet the environmental objectives of the Strategic Plan.

Information:

For more information on the City of Mississauga's Strategic Plan, see:

http://www.mississauga.ca/portal/strategicplan.

Copies of the Strategic Plan and Action Plan can be downloaded from:

http://www.mississauga.ca/portal/strategicplan/plan

Information:

For more information on the Living Green Master Plan, see: http://www5.mississauga.ca/marketing/websites/livinggreen/downloads/LGMP2012_Final.pdf

1.6.3 CLIMATE CHANGE ACTION PLAN

The Climate Change Action Plan will be Mississauga's first action plan on climate change and will contain specific actions under five main Action Pathways: Building and Clean Energy, Resiliency, Accelerating Discovery and Innovation, Low Emissions Mobility, and Engagement

and Partnerships. It will require municipal buildings to reduce its energy by 25% below 2008 levels by 2030.

1.6.4 SUSTAINABLE PROCUREMENT POLICY

The City's Sustainable Procurement Policy commits the City to consider a range of sustainability aspects into procurement, including for services and technologies for lifecycle replacements in existing buildings and for new building and facility construction. It requires the City to purchase goods and services from suppliers that: reduce material use, waste and packaging, promote reuse, recycled content, maximize energy efficiency, reduce GHG emissions, conserve water and improve water quality, eliminate use of toxins, and contribute to biodiversity preservation.

Information:

For more information on the Sustainable Procurement Policy, see: https://web.mississauga.ca/publication/sustainable-procurement-policy/

2.0 CITY WIDE FACILITIES

2.1 SCOPE AND BOUNDARY

This section covers All City Facilities. Later Sections will provide information for each group type of facilities in the City. The different Facility Group Types that will be covered include:

- Administration and Offices *(2 facilities/locations)*
- Indoor Ice Arenas *(7 facilities/locations)*
- Community Centres and Multi-Purpose Facilities *(15 facilities/locations)*
- Cultural and Performing Arts *(8 facilities/locations)*
- Fire Stations and Emergency Services *(27 facilities/locations)*
- Golf Courses and Associated Facilities *(7 facilities/locations)*
- Heritage Buildings *(6 facilities/locations)*
- Leased Facilities and Properties *(9 facilities/locations)*
- Libraries *(11 facilities/locations)*
- Community Halls, Marinas, and Animal Services *(16 facilities/locations)*
- Outdoor Pool Buildings *(7 facilities/locations)*
- Parks and Sports Fields *(242 facilities/locations)*
- Traffic and Street Lighting *(7 facilities/locations)*
- Transit and Associated Facilities *(17 facilities/locations)*
- Service Yards, Central Stores, and Maintenance Facilities *(7 facilities/locations)*

City Facilities have a total floor area of approximately 465,700 square meters.

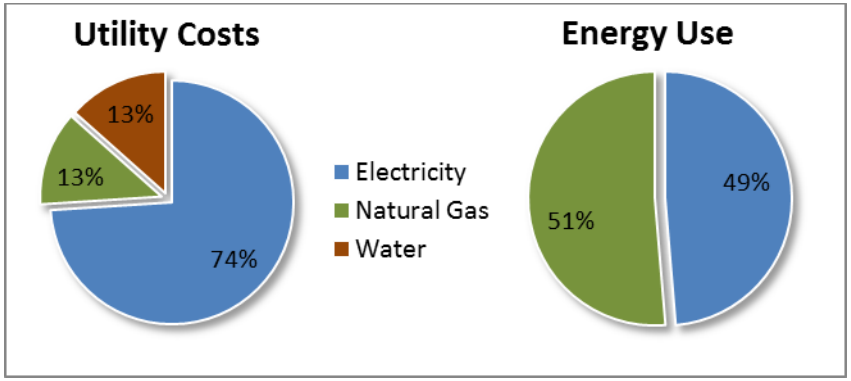
2.2 BASELINE

2.2.1 ENERGY USE

The energy use (combined electricity and natural gas) for **City Wide Facilities** was 181,266,000 equivalent kilowatt hours in 2018. Following are the key takeaways for the energy usage in 2018:

- 49% of the total energy usage was due to electricity use, which has dropped by 23.5% since 2013
- 51% of the total energy usage was due to natural gas use, which has remained consistent since 2013
- A total of $17,998,000 in utility costs was incurred, out of which 74% is attributed to electricity, 13% to natural gas, and 13% to water

Figure 2-1: Utility Costs and Energy Use Breakdown for City Wide Facilities



2.2.2 ENERGY USE INTENSITY

Energy Use Intensity (EUI) is a measurement that expresses a building's energy use as a function of its size or other characteristic. It is used to give a better picture of the energy efficiency of a facility. The lower the EUI, the more efficient the facility is.

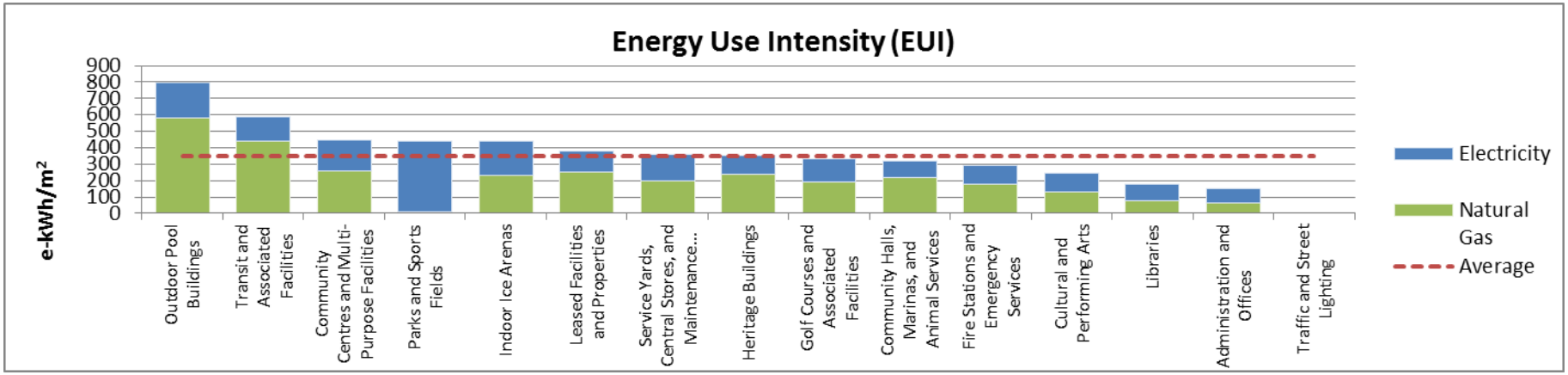
When reviewing EUI, the facility operation type and hours should be taken into account. For example, a facility that operates 24 hours a day will most likely have a higher EUI than a similar one that operates 8 hours a day. Similarly, a facility that has high energy using systems that do not contribute to the building area, such as an outdoor pool or outdoor ice rink, will have a higher EUI than a facility where those systems are located within the facility, as they would add to the facility's area footprint.

For **City Wide Facilities** the average EUI in 2018 was 351.9 e-kWh/m2.

The following chart shows the EUI for each group within **City Wide Facilities**, and compares it to the average for all facilities.

Note: The Average EUI value is calculated by taking the total energy use of all facilities, and dividing by the total area of the facilities. As such, a larger facility would have a bigger impact on the average than a smaller facility.

Figure 2-3: Energy Use Intensity for City Wide Facilities



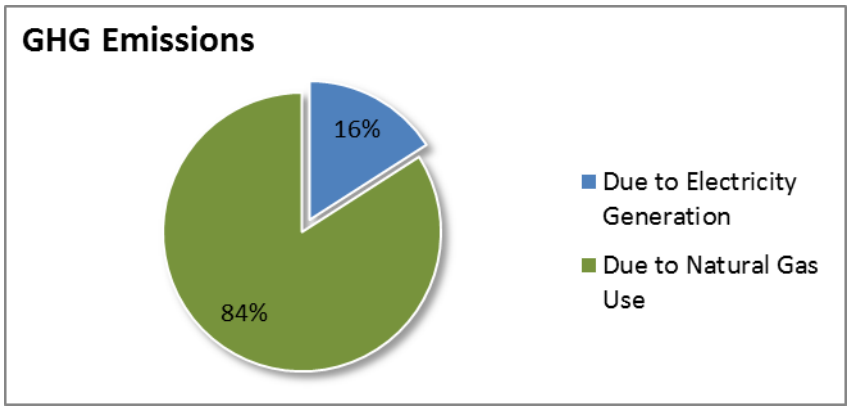
2.2.3 GREENHOUSE GAS (GHG) EMISSIONS

For 2018, **City Wide Facilities** emitted 19,928,800 kg (or 19,929 tonnes) of CO2. 15.1% of these emissions were due to the generation of electricity, while the use of natural gas accounted for the remaining 84.1%.

Did you know...?

19,927 tonnes of CO2 is equivalent to the annual emissions of 3,900 automobiles.

Figure 2-4: GHG Emissions Breakdown for City Wide Facilities



2.3 ENERGY AND GHG BREAKDOWN FOR CITY WIDE FACILITIES

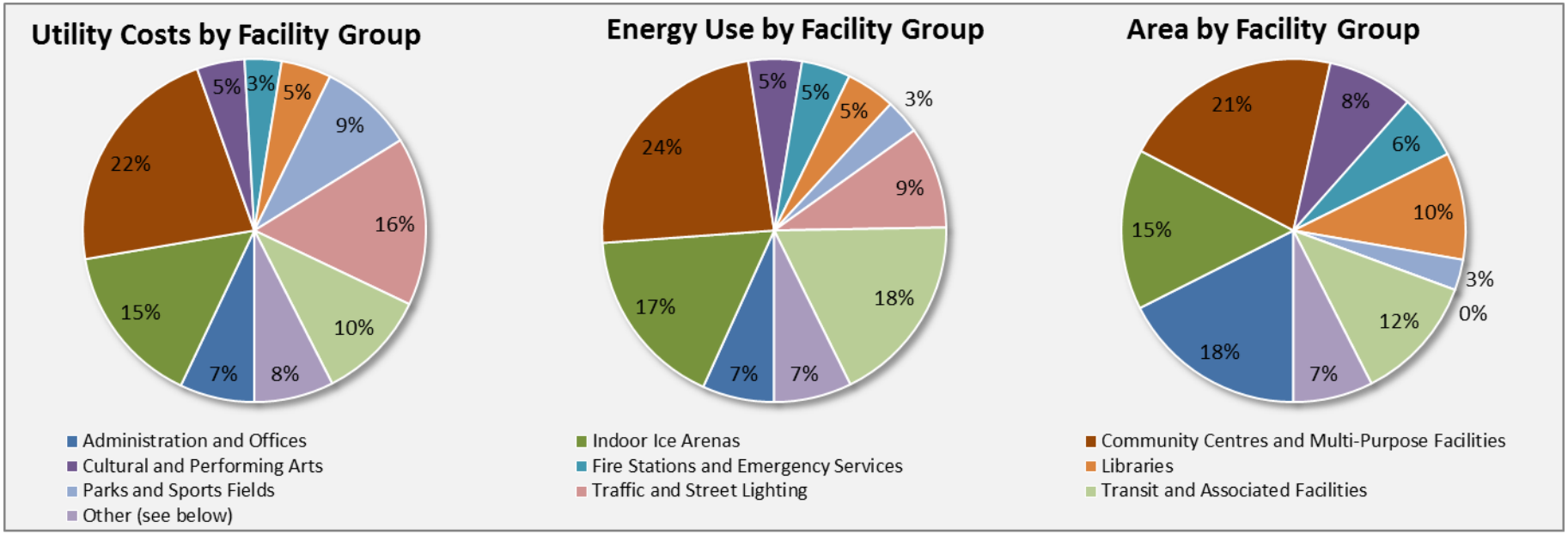
This section provides a brief overview/recap of the Utility and GHG data for all City Facility Groups. The figure below shows the breakdown of utility costs and energy use by Facility Group for 2018. Note: Facility Groups subtotalled under 'Other' are further broken down in the smaller charts.

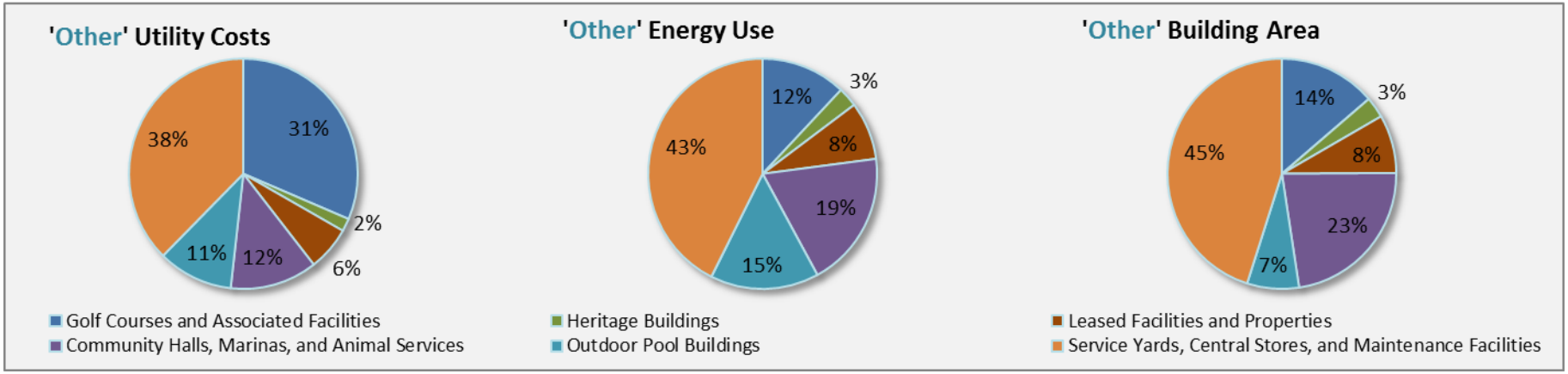
The table summarizes the utility (electricity, natural gas, and water) costs and emissions, as well as GHG emissions, for the various Facility Group types.

Following are the key takeaways from the breakdowns

- Top four facility groups by floor area consume 66% of the City's total energy; it includes the following:
  - Community Centres and Multi-Purpose Facilities *(13 facilities/locations)*
  - Transit and Associated Facilities *(13 facilities/locations)*
  - Indoor Ice Arenas *(5 facilities/locations)*
  - Administration and Offices *(2 facilities/locations)*
- The next three facility groups by floor area consume 15% of the City's total energy; it includes the following:
  - Libraries *(11 facilities/locations)*
  - Fire Stations and Emergency Services *(21 facilities/locations)*
  - Cultural and Performing Arts *(8 facilities/locations)*
- 12% of the City's energy is consumed by facility groups that do not have an associated building/floor area:
  - Traffic and Street Lighting
  - Parks and Sports Fields
- Remaining 7% of the City's energy is consumed by facility groups that add up to 7% of the total floor area in the City; it includes the following:
  - Service Yards, Central Stores, and Maintenance Facilities *(6 facilities/locations)*
  - Community Halls, Marinas, and Animal Services *(13 facilities/locations)*
  - Outdoor Pool Buildings *(7 facilities/locations)*
  - Golf Courses and Associated Facilities *(6 facilities/locations)*
  - Leased Facilities and Properties *(9 facilities/locations)*
  - Heritage Buildings *(4 facilities/locations)*

Figure 2-5: Utility Costs and Energy Use Breakdown by Facility Groups





2018 Annual Report for All City Facilities

Facility	# Facilities	Area m^2	Electricity kWh	Electricity $	Natural Gas m^3	Natural Gas $	Total Energy e-kWh	Water m^3	Water $	Total Costs $	GHG Emissions kg
Administration and Offices	2	81,795	7,019,486	$1,051,917	503,430	$120,856	**12,305,504**	39,609	$97,023	**$1,269,796**	1,204,688
Indoor Ice Arenas	7	70,274	14,842,160	$2,198,481	1,531,296	$375,091	**30,920,765**	87,901	$174,596	**$2,748,168**	3,429,998
Community Centres and Multi-Purpose Facilities	15	96,903	17,708,808	$2,702,407	2,407,967	$604,635	**42,992,457**	293,050	$696,778	**$4,003,820**	5,190,982
Cultural and Performing Arts	8	37,718	4,234,268	$638,057	465,125	$120,508	**9,118,080**	20,984	$51,349	**$809,915**	1,031,985
Fire Stations and Emergency Services	27	28,473	3,220,540	$435,700	488,035	$141,274	**8,344,910**	19,436	$47,170	**$624,144**	1,038,814
Golf Courses and Associated Facilities	7	4,780	667,834	$108,368	87,446	$28,094	**1,586,018**	195,575	$287,287	**$423,749**	189,403
Heritage Buildings	6	1,036	115,384	$13,927	23,796	$8,507	**365,240**	1,337	$2,018	**$24,451**	49,152
Leased Facilities and Properties	9	2,873	405,065	$47,886	68,416	$21,303	**1,123,436**	10,736	$19,363	**$88,551**	143,957
Libraries	11	46,841	4,768,404	$692,109	344,914	$91,375	**8,389,998**	27,009	$66,356	**$849,840**	823,894
Community Halls, Marinas, and Animal Services	16	7,938	828,133	$79,992	163,101	$60,319	**2,540,691**	10,214	$25,104	**$165,415**	338,236
Outdoor Pool Buildings	7	2,548	539,474	$60,967	141,429	$39,345	**2,024,476**	17,214	$42,378	**$142,690**	286,863
Parks and Sports Fields	242	13,458	5,821,686	$897,706	11,409	$4,397	**5,941,479**	398,642	$702,081	**$1,604,185**	231,155
Traffic and Street Lighting	7	0	17,388,450	$2,855,134	0	$0	**17,388,450**	0	$0	**$2,855,134**	625,984
Transit and Associated Facilities	17	55,364	8,183,840	$1,175,040	2,323,236	$567,376	**32,577,821**	58,581	$138,618	**$1,881,034**	4,687,858
Service Yards, Central Stores, and Maintenance Facilities	7	15,748	2,505,868	$360,171	299,115	$80,326	**5,646,574**	27,195	$66,485	**$506,983**	655,837
Totals	388	465,749	88,249,400	$13,317,862	8,858,714	$2,263,405	**181,265,899**	1,207,482	$2,416,607	**$17,997,875**	19,928,807
Usage / Costs per m^2:			152.1	$22.5	19.0	$4.9	**352**	2.6	$5.2	**$32.5**	41.4

2.4 ACTION PLAN

An action plan has been identified with the goal to save on electricity, natural gas, oil, and/or other form of energy consumption within a facility or location.

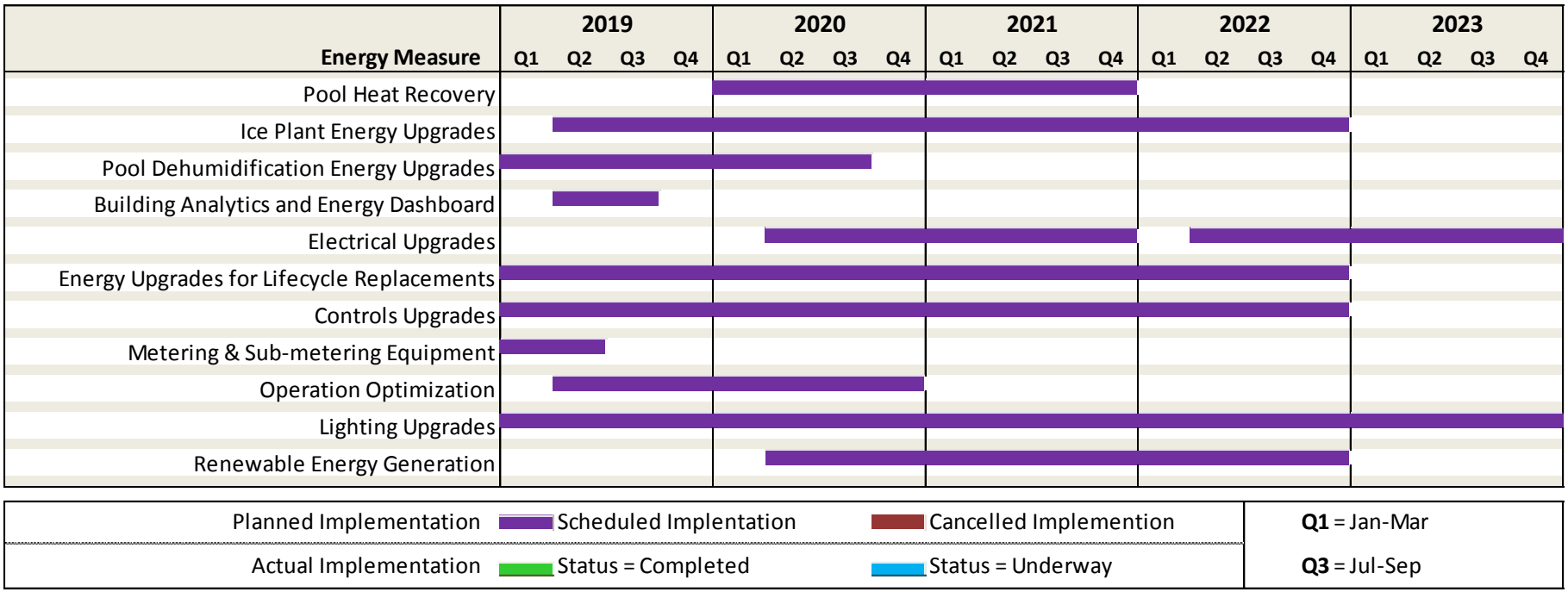
The following figure shows the various projects and initiatives that have been planned for **City Wide Facilities**. The chart shows what projects have been planned, when they are planned to be implemented, and the progress of implementation (if applicable). A brief description of each project has been noted below:

- **Pool Heat Recovery**: Includes recovering heat from the pool drain and transferring the recovered heat to the fresh water supply to the pool, reducing the heat load on the pool boilers
- **Ice Plant Energy Upgrades**: Includes a robust ice plant controls with the ability to modulate the equipment and reset setpoints based on varying loads and outside conditions, and cold water ice resurfacing
- **Pool Dehumidification Energy Upgrades**: Includes optimized controls for the dehumidification equipment in the pool with better modulation capabilities
- **Building Analytics and Energy Dashboard**: Is being piloted to collect, manage, and analyse data from various building systems with the capabilities of energy analysis, load profiling, facility benchmarking, asset performance tracking, fault detection, and creating energy dashboards
- **Electrical Upgrades**: Includes devices reduce the wastages associated with the distribution of the electrical feed like voltage regulation, power factor correction, efficient transformers
- **Energy Upgrades for Lifecycle Replacements**: Includes energy upgrades for high capital assets that show economic paybacks only at the time of replacement like envelope and HVAC equipment
- **Controls Upgrades**: Includes controller upgrades, optimized sequence of operations, and additional points to better manage and control building systems
- **Metering & Sub-metering**: Includes real-time monitoring of building and select components to provide the ability to analyze consumption data, identify solutions to conserve energy, and conduct measurement & verification
- **Lighting Upgrades**: Includes replacement of existing lighting technologies to newer technologies like LEDs, and better controls through localized sensors and BAS scheduling
- **Renewable Energy Generation**: Includes energy generation from renewable sources like solar photovoltaics, solar hot water heating, solar lighting

For the chart below, the **Purple** coloured bars represent the original planned start and completion of a Measure type. The **Green** bar beneath shows the actual start and completion times for a completed measure, while the **Blue** bar shows the actual start time of a Measure that is currently being implemented, but not yet complete. Some Notes:

- A Single Measure timeline may include more than one implementation of that measure (example: In different facilities).
- Due to changing circumstances (change in operations, budget changes, new technology, etc.), a planned measure may be cancelled. These would be indicated by a **Red** plan bar on the chart.

Figure 2-6: Energy Measure Implementation Plan for City Wide Facilities

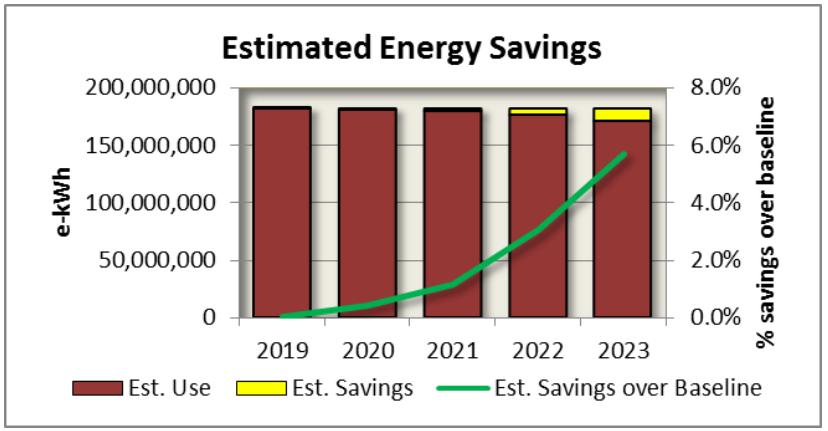


2.5 ESTIMATED SAVINGS

At the end of the plan, **City Wide Facilities** are expected to save 5.7% over the base year of 2018, which amounts to a total of $1,352,750 from all the projects.

See the chart below for the expected annual savings in the 5-Year Energy Conservation Plan.

Figure 2-7: Energy Measure Annual Savings for City Wide Facilities



2.6 REPORTING AND PROGRESS TO TARGETS

As per the 5-Year Energy Conservation Plan, the City is targeting a 1.0% reduction in energy use per year in facilities. By 2023, this should result in a 5.0% reduction over the base year, 2018.

The reporting of energy consumption data and savings for **City Wide Facilities** will be based on utility meters and assembled annually. Since utility meters monitor energy consumption for the entire facility, the measurement boundary will encompass all parts of the facility. To determine the savings and fairly compare year-to-year energy consumption data, it is important to account for independent variables such as weather and occupancy and apply regression analysis to consumption data. Therefore, actual consumption data for each year starting 2019 will be adjusted to match the weather and occupancy of 2018. The figures below show the updated progress for each year against the set target.

Figure 2-8: Annual Energy Use vs Targeted Energy Use for City Wide Facilities

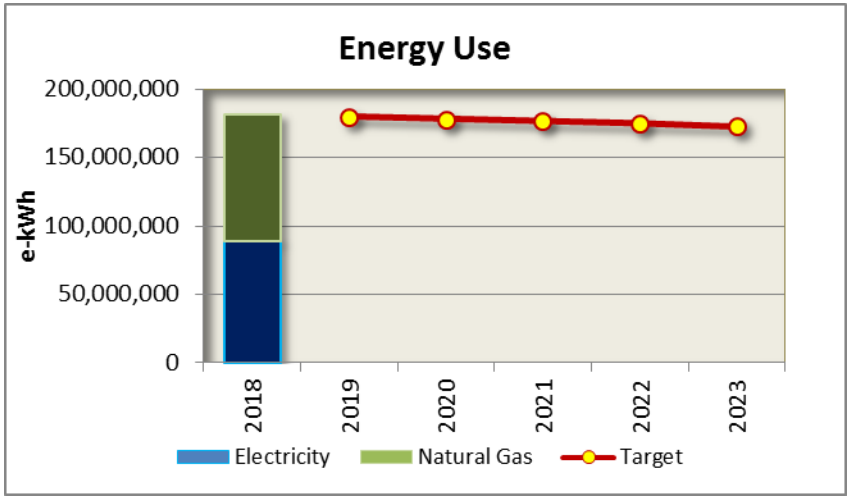
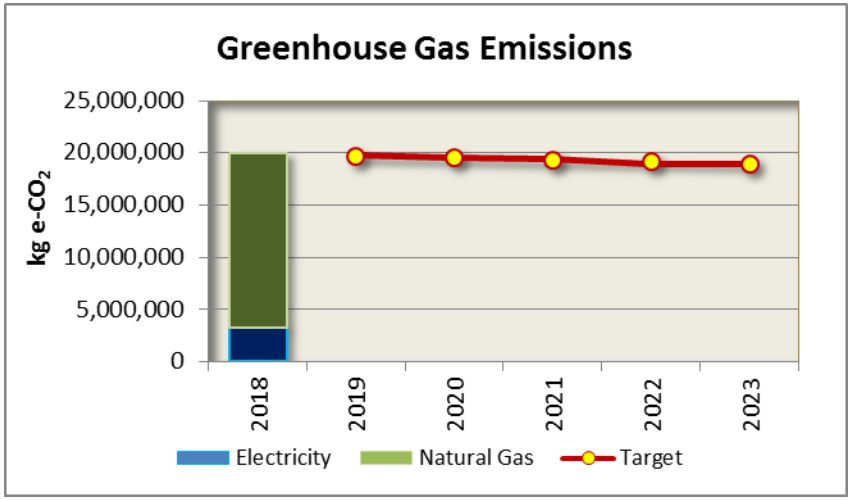


Figure 2-9: Annual GHG Emissions vs Targets for City Wide Facilities



2.7 ENERGY CONSUMPTION REPORTING FOR FACILITIES OUTSIDE THE BASELINE SCOPE

As population grows in the City, so does the need to expand the City's services and facilities. Since it would be unfair to compare year-to-year energy consumption as significant deviations in operations occur, such deviations/anomalies will not be reported in the previous sections.

Therefore, this section will track energy consumption in **City Wide Facilities** that either did not exist, did not operate, or its operations significantly deviated from the base year, 2018.

3.0 ADMINISTRATION AND OFFICES

3.1 SCOPE AND BOUNDARY

Administration and Offices facilities include all the City's non-transit buildings that consist primarily of offices and administration types operations.

For the purposes of this report, the City of Mississauga has 2 facilities/locations that fall under this category. They include:

- Mississauga City Hall
- Ontario Court of Justice

The above listed locations have a total floor area of approximately 81,800 square meters. This would account for 17.6% of the total building area for City of Mississauga facilities included in this Plan.

3.2 BASELINE

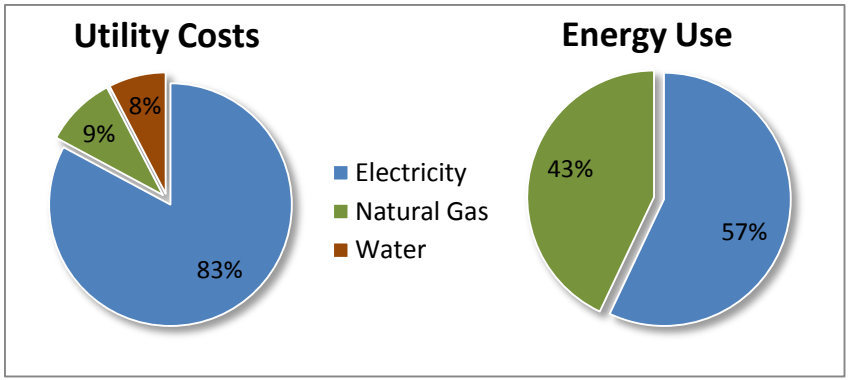
3.2.1 ENERGY USE

The energy use (combined electricity and natural gas) for **Administration and Offices** was 12,306,000 equivalent kilowatt hours in 2018. Following are the key takeaways for the energy usage in 2018:

- 57% of the total energy usage was due to electricity use, which has dropped by 14.0% since 2013
- 43% of the total energy usage was due to natural gas use, which has dropped by 10.2% since 2013
- A total of $1,270,000 in utility costs was incurred, out of which 83% is attributed to electricity, 9% to natural gas, and 8% to water

Administration and Offices accounted for 7.1% of the City's total utility budget for 2018.

Figure 3-1: Utility Costs and Energy Use Breakdown for Administration and Offices



3.2.2 ENERGY USE INTENSITY

Energy Use Intensity (EUI) is a measurement that expresses a building's energy use as a function of its size or other characteristic. It is used to give a better picture of the energy efficiency of a facility. The lower the EUI, the more efficient the facility is.

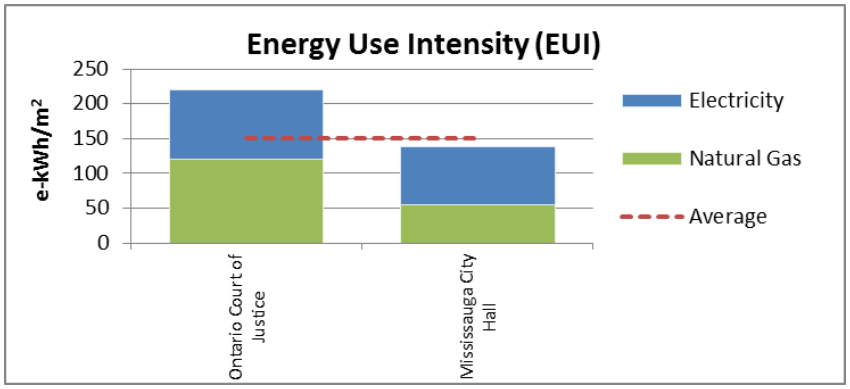
When reviewing EUI, the facility operation type and hours should be taken into account. For example, a facility that operates 24 hours a day will most likely have a higher EUI than a similar one that operates 8 hours a day. Similarly, a facility that has high energy using systems that do not contribute to the building area, such as an outdoor pool or outdoor ice rink, will have a higher EUI than a facility where those systems are located within the facility, as they would add to the facility's area footprint.

For **Administration and Offices** the average EUI in 2018 was 150.4 e-kWh/m2.

The following chart shows the EUI for each facility within Administration and Offices, and compares it to the average for the group.

Note: The Average EUI value is calculated by taking the total energy use of all facilities, and dividing by the total area of the facilities. As such, a larger facility would have a bigger impact on the average than a smaller facility.

Figure 3-2: Energy Use Intensity for Administration and Offices

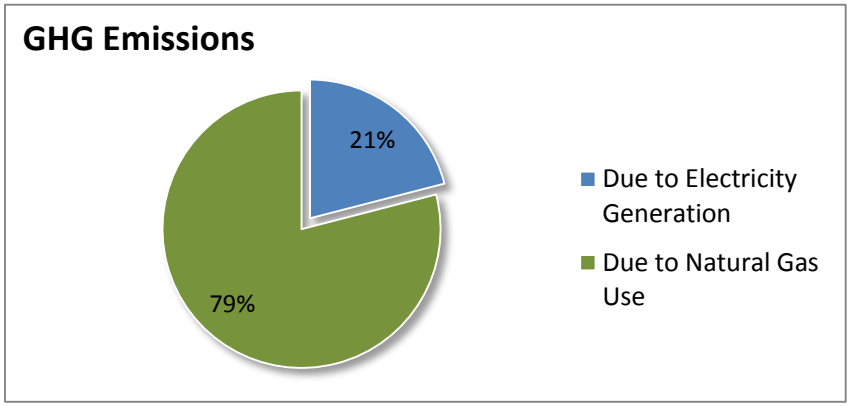


3.2.3 GREENHOUSE GAS (GHG) EMISSIONS

Administration and Offices emitted 1,204,700 kg (or 1,205 tonnes) of CO2 in 2018. 21.0% of these emissions were due to the generation of electricity, while the use of natural gas accounted for the remaining 79.0%.

Administration and Offices accounted for 6.0% of the City's total GHG emissions for facilities included in the plan.

Figure 3-3: GHG Emissions Breakdown for Administration and Offices

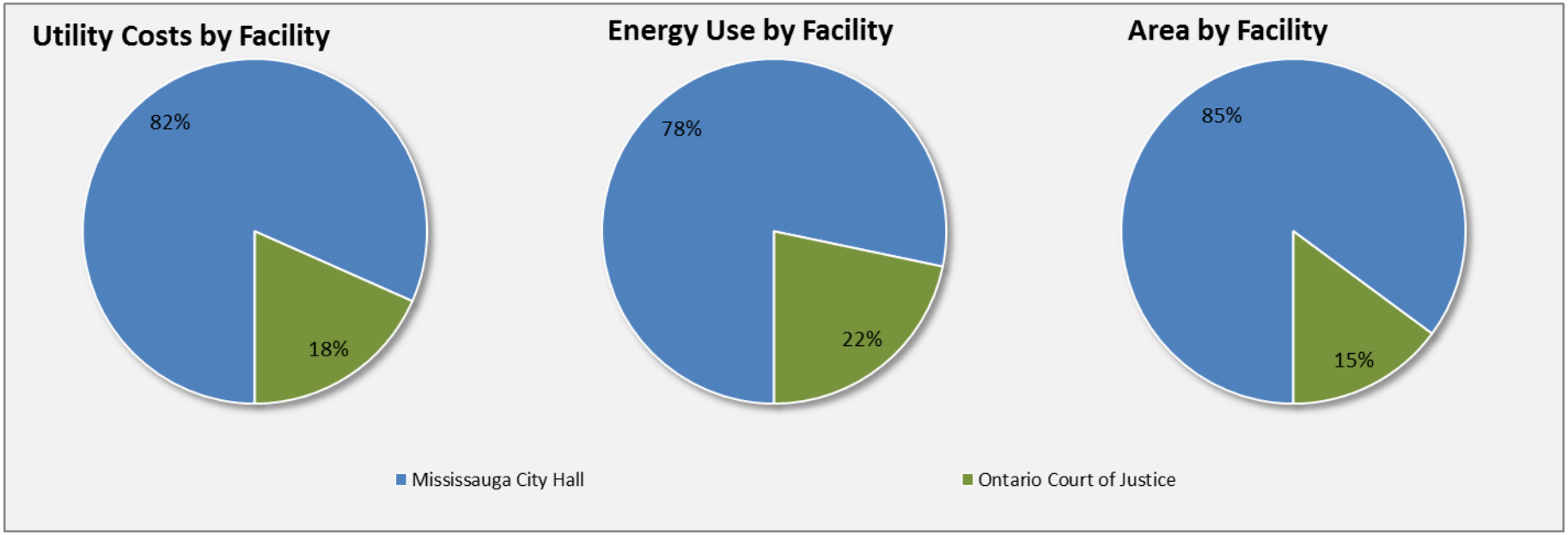


3.3 ENERGY AND GHG BREAKDOWN FOR ADMINISTRATION AND OFFICES

This section provides a brief overview/recap of the Utility and GHG data for **Administration and Offices**. The table below summarizes, by facility, the utility usage and GHG emissions for 2018. Following are the key takeaways:

- Mississauga City Hall is the largest facility by area in this group, representing 85% of the total area
- Mississauga City Hall is also the largest consumer of energy in this group, representing 78% of the total energy consumption
- Electrical loads like lighting, cooling, fans, and motors are a much larger portion of the energy use and utility use (57% and 83% respectively) in this group
- For this reason, priority was given to projects reducing electricity usage for previous and future planned projects

Figure 3-4: Utility Costs and Energy Use Breakdown by Facility Groups



2014 Annual Utility Report for Administration and Offices

Facility	Area	Electricity		Natural Gas		Total Energy	Water		Total Costs	GHG Emissions
	m^2	kWh	$	m^3	$	e-kWh	m^3	$	$	kg
Mississauga City Hall	69,621	6,455,825	$795,213	360,370	$81,641	**10,239,710**	29,081	$54,618	**$931,472**	1,178,558
Ontario Court of Justice	12,174	1,135,783	$144,837	170,657	$39,619	**2,927,682**	3,266	$6,162	**$190,618**	410,168
Totals	81,795	7,591,608	$940,050	531,027	$121,260	**13,167,392**	32,347	$60,780	**$1,122,090**	1,588,726
Usage / Costs per m^2:		92.8	$11.5	6.5	$1.5	**161**	0.4	$0.7	**$13.7**	19.4

3.4 ACTION PLAN

An action plan has been identified with the goal to save on electricity, natural gas, oil, and/or other form of energy consumption within a facility or location.

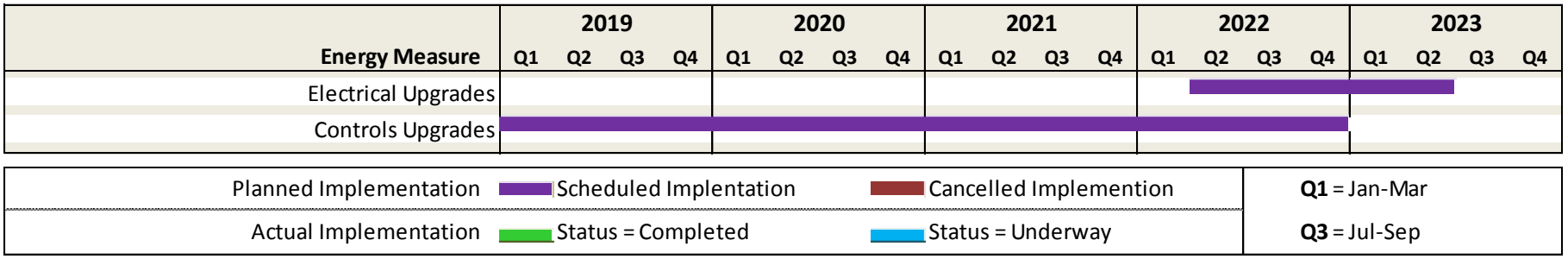
The following figure shows the various projects and initiatives that have been planned for **Administration and Offices**. The chart shows what projects have been planned, when they are planned to be implemented, and the progress of implementation (if applicable). A brief description of each project has been noted below:

- **Electrical Upgrades**: Includes devices reduce the wastages associated with the distribution of the electrical feed like voltage regulation, power factor correction, efficient transformers
- **Controls Upgrades**: Includes controller upgrades, optimized sequence of operations, and additional points to better manage and control building systems

For the chart below, the **Purple** coloured bars represent the original planned start and completion of a Measure type. The **Green** bar beneath shows the actual start and completion times for a completed measure, while the **Blue** bar shows the actual start time of a Measure that is currently being implemented, but not yet complete. Some Notes:

- A Single Measure timeline may include more than one implementation of that measure (example: In different facilities).
- Due to changing circumstances (change in operations, budget changes, new technology, etc.), a planned measure may be cancelled. These would be indicated by a **Red** plan bar on the chart.

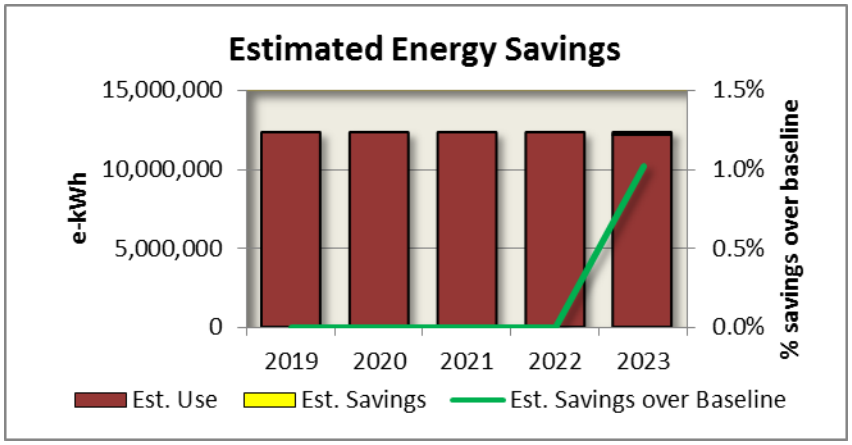
Figure 3-5: Energy Measure Implementation Plan for Administration and Offices



3.5 ESTIMATED SAVINGS

At the end of the plan, **Administration and Offices** are expected to save 1.0% over the base year of 2018, which amounts to a total of $17,000 from all the projects.

Figure 3-6: Energy Measure Annual Savings for Administration and Offices



3.6 PROGRESS TO TARGETS

The City is targeting a 1.0% reduction in energy use in **Administration and Offices** by 2023 over the base year, 2018. The reporting of energy consumption data and savings for **Administration and Offices** will be based on utility meters and assembled annually. Since utility meters monitor energy consumption for the entire facility, the measurement boundary will encompass all parts of the facility. To determine the savings and fairly compare year-to-year energy consumption data, it is important to account for independent variables such as weather and occupancy and apply regression analysis to consumption data. Therefore, actual consumption data for each year starting 2019 will be adjusted to match the weather and occupancy of 2018. The figures below show the updated progress for each year against the set target.

Figure 3-7: Annual Energy Use vs Targeted Energy Use for Administration and Offices

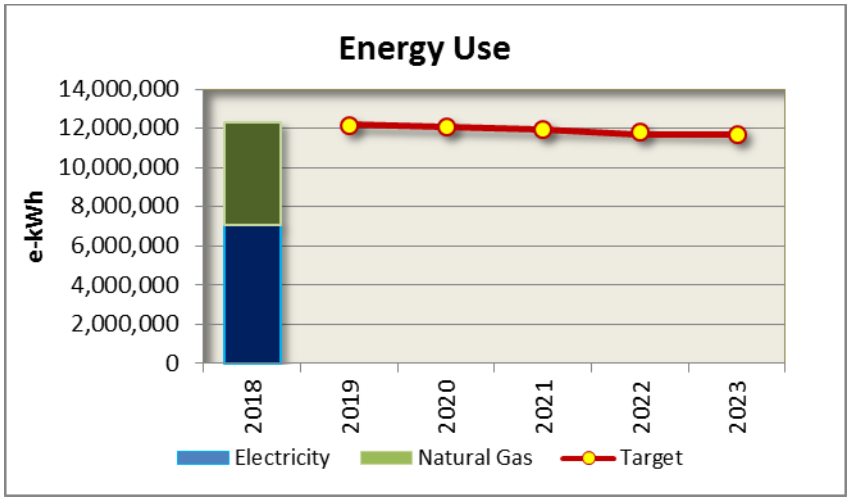
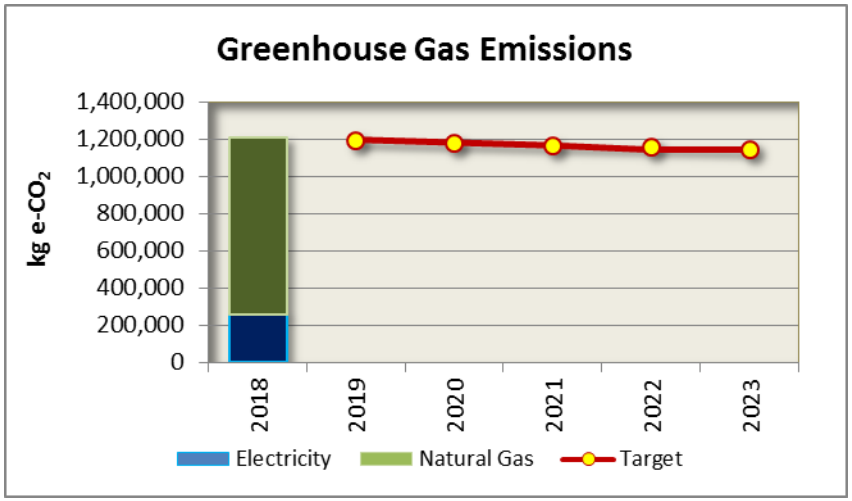


Figure 3-8: Annual GHG Emissions vs Targets for Administration and Offices



3.7 FACILITY INFORMATION FOR ADMINISTRATION AND OFFICES

Facility: Mississauga City Hall

Address	300 City Centre Drive, L5B 3C1
Area (m^2):	69,621
Area (ft^2):	749,394
Year Built:	1987
Hours per Week :	55
Facility Group:	Admin
Building Components:	Council Chambers; Day Care; Offices and Meeting Rooms; Underground Parking

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	6,307,725	6,080,808	5,818,052
Electricity ($)	$977,467	$932,697	$863,617
Natural Gas (m^3)	291,142	340,287	363,282
Natural Gas ($)	$69,317	$85,402	$86,623
Water (m^3)	47,673	37,332	35,274
Water ($)	$104,287	$85,058	$86,398
Total Costs ($)	$1,151,071	$1,103,156	$1,036,638
Total e-kWh	9,364,717	9,653,816	9,632,510
Total e-kWh/m^2	134.5	138.7	138.4
GHG (kg/Yr)	777,628	862,391	896,416
GHG (kg/Yr/m^2)	*11*	*12*	*13*

Energy Measures

Energy Upgrades for Lifecycle Replacements
Controls Upgrades
Metering & Sub-metering Equipment
Lighting Upgrades

Facility: Ontario Court of Justice

Address: 950 Burnhamthorpe Road W, L5C 3B4

Area (m^2): 12,174 Area (ft^2): 131,040

Year Built: 1977 Hours per Week : 70

Facility Group: Admin

Building Components: Courthouse; Offices and Meeting Rooms

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	1,108,701	1,134,483	1,201,435
Electricity ($)	$188,254	$184,593	$188,300
Natural Gas (m^3)	133,190	136,772	140,149
Natural Gas ($)	$31,577	$34,713	$34,232
Water (m^3)	3,724	3,451	4,335
Water ($)	$8,161	$7,908	$10,626
Total Costs ($)	$227,992	$227,214	$233,158
Total e-kWh	2,507,198	2,570,584	2,672,994
Total e-kWh/m^2	205.9	211.2	219.6
GHG (kg/Yr)	291,776	299,476	308,273
GHG (kg/Yr/m^2)	*24*	*25*	*25*

Energy Measures

Electrical Upgrades

4.0 INDOOR ICE ARENAS

4.1 SCOPE AND BOUNDARY

The City's Indoor Ice Arenas are facilities where the primary (only) operation is that of an arena (i.e. the facility does not have any other major recreational operations such as a gymnasium or pool).

A few of the City's arenas have year-round ice, where the remaining arenas only have ice during the fall/winter seasons (generally August/September to April/May). When no ice is in place, the arenas are still used for other activities.

For the purposes of this report, the City of Mississauga has 7 facilities/locations that fall under this category. They include:

- Erin Mills Twin Arena
- Iceland Arena
- Paul Coffey Arena
- Meadowvale 4 Rinks
- Paramount Fine Foods Centre - Main Bowl and Community Rinks
- Port Credit Arena
- Tomken Twin Arena

The above listed locations have a total floor area of approximately 70,300 square meters. This would account for 15.1% of the total building area for City of Mississauga facilities included in this Plan.

4.2 BASELINE

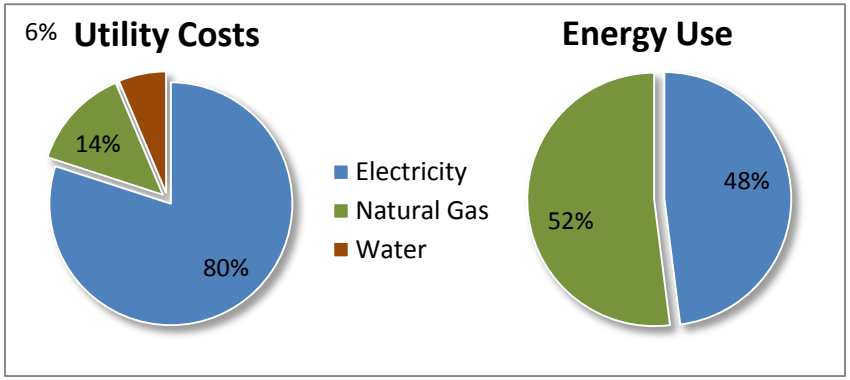
4.2.1 ENERGY USE

The energy use (combined electricity and natural gas) for **Indoor Ice Arenas** was 30,921,000 equivalent kilowatt hours in 2018. Following are the key takeaways for the energy usage in 2018:

- 48% of the total energy usage was due to electricity use, which has dropped by 23.5% since 2013
- 52% of the total energy usage was due to natural gas use, which has remained consistent since 2013
- A total of $2,748,000 in utility costs was incurred, out of which 80% is attributed to electricity, 14% to natural gas, and 6% to water

Indoor Ice Arenas accounted for 15.3% of the City's total utility budget for 2018.

Figure 4-1: Utility Costs and Energy Use Breakdown for Indoor Ice Arenas



4.2.2 ENERGY USE INTENSITY

Energy Use Intensity (EUI) is a measurement that expresses a building's energy use as a function of its size or other characteristic. It is used to give a better picture of the energy efficiency of a facility. The lower the EUI, the more efficient the facility is.

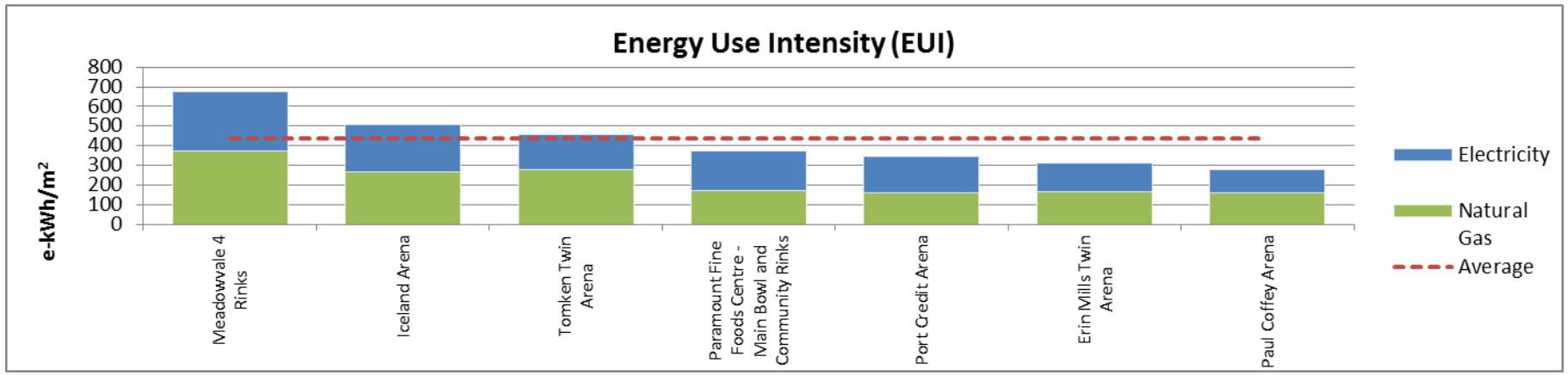
When reviewing EUI, the facility operation type and hours should be taken into account. For example, a facility that operates 24 hours a day will most likely have a higher EUI than a similar one that operates 8 hours a day. Similarly, a facility that has high energy using systems that do not contribute to the building area, such as an outdoor pool or outdoor ice rink, will have a higher EUI than a facility where those systems are located within the facility, as they would add to the facility's area footprint.

For **Indoor Ice Arenas** the average EUI in 2018 was 440.0 e-kWh/m2.

The following chart shows the EUI for each facility within **Indoor Ice Arenas**, and compares it to the average for the group.

Note: The Average EUI value is calculated by taking the total energy use of all facilities, and dividing by the total area of the facilities. As such, a larger facility would have a bigger impact on the average than a smaller facility.

Figure 4-2: Energy Use Intensity for Indoor Ice Arenas

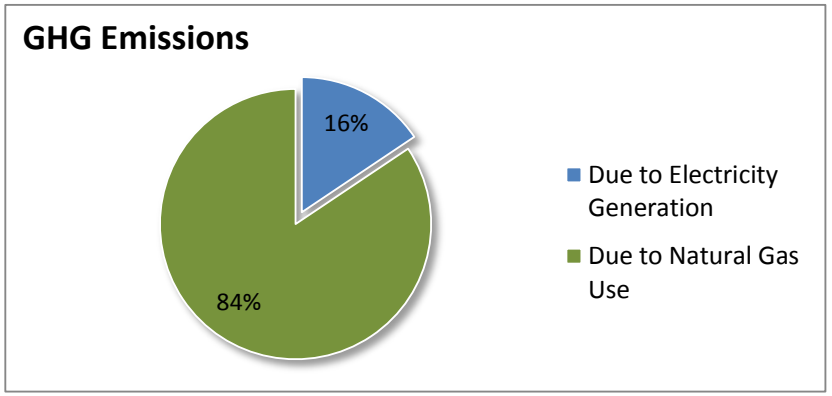


4.2.3 GREENHOUSE GAS (GHG) EMISSIONS

For 2018, **Indoor Ice Arenas** emitted 3,430,000 kg (or 3,430 tonnes) of CO2 in 2018. 15.6% of these emissions were due to the generation of electricity, while the use of natural gas accounted for the remaining 84.4%.

Indoor Ice Arenas accounted for 17.2% of the City's total GHG emissions for facilities included in the plan.

Figure 4-3: GHG Emissions Breakdown for Administration and Offices

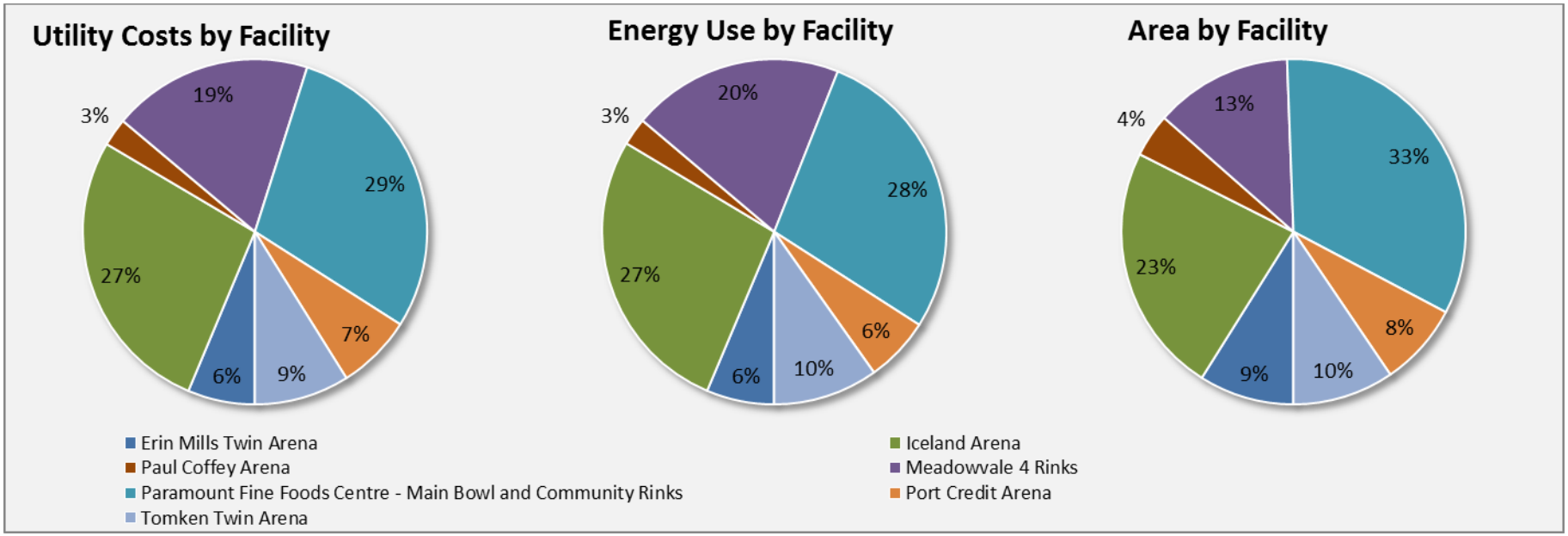


4.3 ENERGY AND GHG BREAKDOWN FOR INDOOR ICE ARENAS

This section provides a brief overview/recap of the Utility and GHG data for **Indoor Ice Arenas**. The table below summarizes, by facility, the utility usage and GHG emissions for 2018. Following are the key takeaways:

- The 4-Pad Arenas: Paramount Fine Foods Centre, Iceland Arena, Meadowvale 4 Rinks constitute 69% of the total area in this group and contribute towards 75% of the total energy consumption and utility costs in this group
- The twin pads: Tomken Twin Arena and Erin Mills Twin Arena constitute 19% of the total area in this group and contribute towards 15% of the total energy consumption and utility costs in this group
- The single pads: Port Credit Arena and Paul Coffey Arena constitute 12% of the total area in this group and contribute towards 10% of the total energy consumption and utility costs in this group
- Process loads such as ice plant and de-humidification dominate the energy usage in this group; especially for facilities that operate year-round like Iceland Arena, Meadowvale 4 Rinks, Erin Mills Twin Arena (occasionally)
- For this reason, priority was given to projects reducing electricity usage for previous and future planned projects since they greatly reduce utility budget and energy usage

Figure 4-4: Utility Costs and Energy Use Breakdown by Facility



2018 Annual Report for Indoor Ice Arenas

Facility	Area	Electricity		Natural Gas		Total Energy	Water		Total Costs	GHG Emissions
	m^2	kWh	$	m^3	$	e-kWh	m^3	$	$	kg
Erin Mills Twin Arena	6,287	909,393	$139,369	101,150	$25,805	**1,971,466**	5,083	$8,712	**$173,886**	224,012
Iceland Arena	16,490	4,019,814	$598,983	417,626	$100,960	**8,404,886**	27,109	$46,095	**$746,039**	934,444
Paul Coffey Arena	2,851	343,888	$60,126	43,359	$11,766	**799,158**	0	$0	**$71,892**	94,372
Meadowvale 4 Rinks	9,092	2,744,605	$402,777	324,050	$78,734	**6,147,127**	22,047	$35,744	**$517,255**	711,584
Paramount Fine Foods Centre - Main Bowl and Community Rinks	23,407	4,644,899	$670,346	383,303	$91,979	**8,669,579**	14,466	$37,298	**$799,623**	892,042
Port Credit Arena	5,466	999,430	$148,999	84,379	$21,947	**1,885,413**	9,573	$23,454	**$194,400**	195,541
Tomken Twin Arena	6,681	1,180,131	$177,881	177,429	$43,900	**3,043,137**	9,623	$23,292	**$245,074**	378,003
Totals	70,274	14,842,160	$2,198,481	1,531,296	$375,091	**30,920,765**	87,901	$174,596	**$2,748,168**	3,429,998
Usage / Costs per m^2:		211.2	$31.3	21.8	$5.3	**440**	1.3	$2.6	**$39.1**	48.8

4.4 ACTION PLAN

An action plan has been identified with the goal to save on electricity, natural gas, oil, and/or other form of energy consumption within a facility or location.

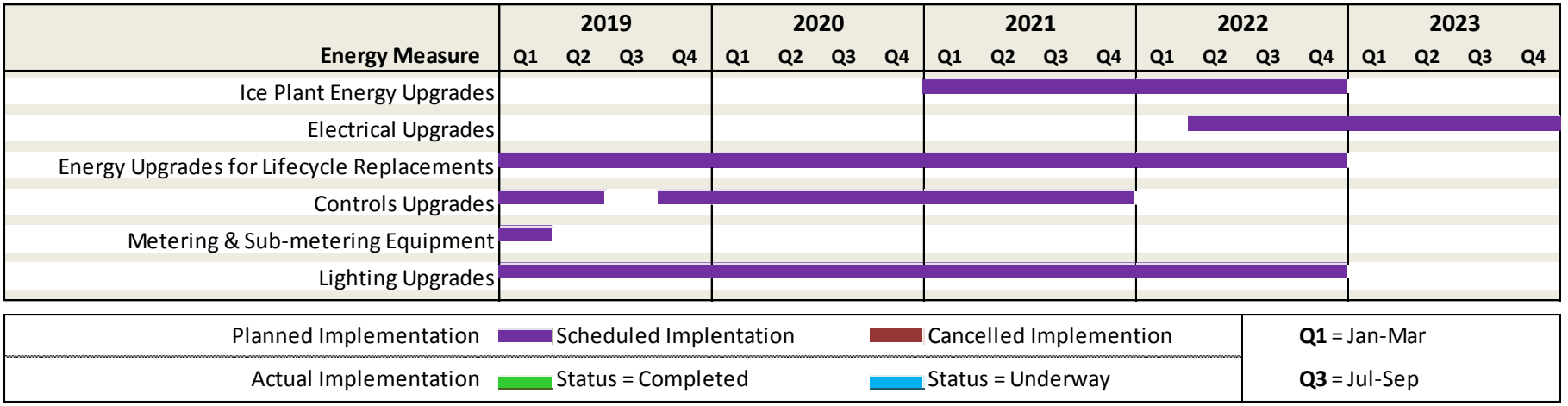
The following figure shows the various projects and initiatives that have been planned for **Indoor Ice Arenas**. The chart shows what projects have been planned, when they are planned to be implemented, and the progress of implementation (if applicable). A brief description of each project has been noted below:

- **Ice Plant Energy Upgrades**: Includes a robust ice plant controls with the ability to modulate the equipment and reset setpoints based on varying loads and outside conditions, and cold water ice resurfacing
- **Electrical Upgrades**: Includes devices reduce the wastages associated with the distribution of the electrical feed like voltage regulation, power factor correction, efficient transformers
- **Energy Upgrades for Lifecycle Replacements**: Includes energy upgrades for high capital assets that show economic paybacks only at the time of replacement like envelope and HVAC equipment
- **Controls Upgrades**: Includes controller upgrades, optimized sequence of operations, and additional points to better manage and control building systems
- **Metering & Sub-metering**: Includes real-time monitoring of building and select components to provide the ability to analyze consumption data, identify solutions to conserve energy, and conduct measurement & verification
- **Lighting Upgrades**: Includes replacement of existing lighting technologies to newer technologies like LEDs, and better controls through localized sensors and BAS scheduling

For the chart below, the **Purple** coloured bars represent the original planned start and completion of a Measure type. The **Green** bar beneath shows the actual start and completion times for a completed measure, while the **Blue** bar shows the actual start time of a Measure that is currently being implemented, but not yet complete. Some Notes:

- A Single Measure timeline may include more than one implementation of that measure (example: In different facilities).
- Due to changing circumstances (change in operations, budget changes, new technology, etc.), a planned measure may be cancelled. These would be indicated by a **Red** plan bar on the chart.

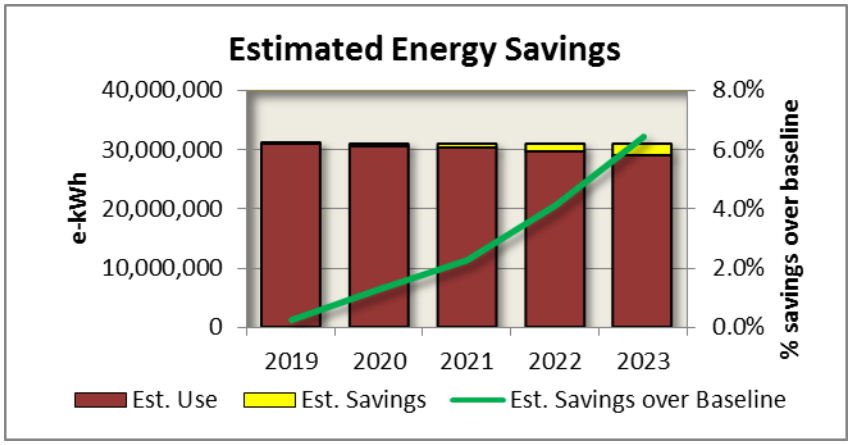
Figure 4-5: Energy Measure Implementation Plan for Indoor Ice Arenas



4.5 ESTIMATED SAVINGS

At the end of the plan, **Indoor Ice Arenas** are expected to save 6.4% over the base year of 2018, which amounts to a total of $275,000 from all the projects.

Figure 4-6: Energy Measure Annual Savings for Indoor Ice Arenas



4.6 PROGRESS TO TARGETS

The City is targeting a 6.4% reduction in energy use in **Indoor Ice Arenas** by 2023 over the base year, 2018. The reporting of energy consumption data and savings for **Indoor Ice Arenas** will be based on utility meters and assembled annually. Since utility meters monitor energy consumption for the entire facility, the measurement boundary will encompass all parts of the facility. To determine the savings and fairly compare year-to-year energy consumption data, it is important to account for independent variables such as weather and occupancy and apply regression analysis to consumption data. Therefore, actual consumption data for each year starting 2019 will be adjusted to match the weather and occupancy of 2018. The figures below show the updated progress for each year against the set target.

Figure 4-7: Annual Energy Use vs Targeted Energy Use for Indoor Ice Arenas

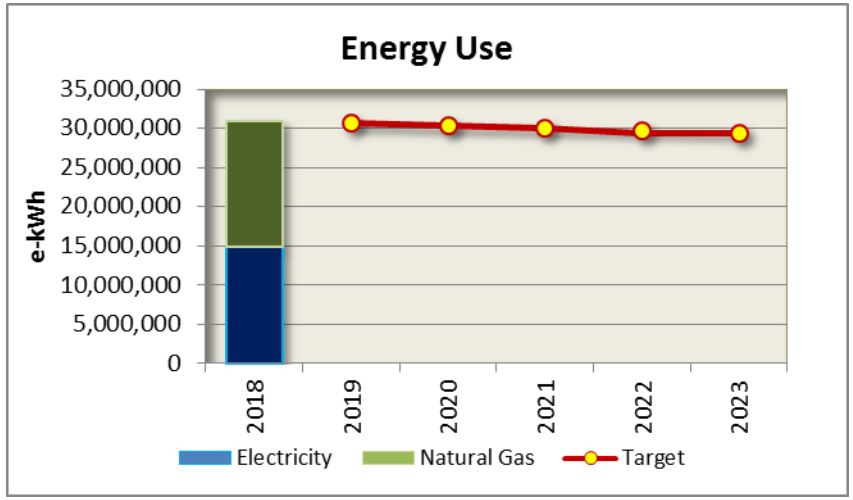
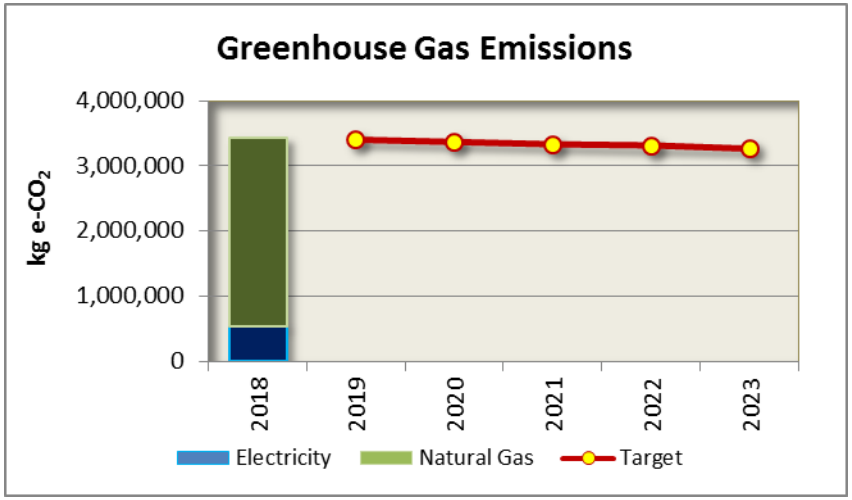


Figure 4-8: Annual GHG Emissions vs Targets for Indoor Ice Arenas



4.7 FACILITY INFORMATION FOR INDOOR ICE ARENAS

Facility: Erin Mills Twin Arena

Address	3205 Unity Dr, L5L 4L5		
Area (m^2):	6,287	Area (ft^2):	67,673
Year Built:	1985	Hours per Week :	125
Facility Group:	Arena		
Building Components:	Ice Rink x 2		

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	1,085,599	1,342,022	909,393
Electricity ($)	$175,140	$216,120	$139,369
Natural Gas (m^3)	103,331	159,192	101,150
Natural Gas ($)	$28,001	$45,182	$25,805
Water (m^3)	6,482	8,142	5,083
Water ($)	$9,798	$13,835	$8,712
Total Costs ($)	$212,939	$275,137	$173,886
Total e-kWh	2,170,573	3,013,532	1,971,466
Total e-kWh/m^2	345.2	479.3	313.6
GHG (kg/Yr)	234,480	349,344	224,012
GHG (kg/Yr/m^2)	*37*	*56*	*36*

Energy Measures

Energy Upgrades for Lifecycle Replacements
Controls Upgrades
Metering & Sub-metering Equipment
Operation Optimization
Lighting Upgrades

Facility: Iceland Arena

Address: 705 Matheson Boulevard East, L4Z 4A6

Area (m^2): 16,490 Area (ft^2): 177,497

Year Built: 1996 Hours per Week : 125

Facility Group: Arena

Building Components: Olympic Sized Rink, 3 Recreational Sized Rinks

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	4,434,700	3,895,730	4,019,814
Electricity ($)	$683,704	$601,728	$598,983
Natural Gas (m^3)	435,633	429,301	417,626
Natural Gas ($)	$110,986	$114,807	$100,960
Water (m^3)	30,078	24,738	27,109
Water ($)	$55,917	$31,600	$46,095
Total Costs ($)	$850,607	$748,134	$746,039
Total e-kWh	9,008,848	8,403,396	8,404,886
Total e-kWh/m^2	546.3	509.6	509.7
GHG (kg/Yr)	983,431	952,055	934,444
GHG (kg/Yr/m^2)	*60*	*58*	*57*

Energy Measures

Electrical Upgrades
Energy Upgrades for Lifecycle Replacements
Controls Upgrades
Metering & Sub-metering Equipment
Operation Optimization
Lighting Upgrades

Facility: Paul Coffey Arena

Address: 3430 Derry Rd E, L4T 1A9

Area (m^2): 2,851 Area (ft^2): 30,688

Year Built: 1968 Hours per Week : 125

Facility Group: Arena

Building Components: Ice Rink

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	405,131	415,350	343,888
Electricity ($)	$68,118	$69,464	$60,126
Natural Gas (m^3)	44,212	37,593	43,359
Natural Gas ($)	$12,143	$11,116	$11,766
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$80,261	$80,580	$71,892
Total e-kWh	869,354	810,075	799,158
Total e-kWh/m^2	304.9	284.1	280.3
GHG (kg/Yr)	98,189	86,041	94,372
GHG (kg/Yr/m^2)	*34*	*30*	*33*

Energy Measures

Electrical Upgrades
Lighting Upgrades

Facility: Meadowvale 4 Rinks

Address: 2160 Torquay Mews, L5N 1P7

Area (m^2): 9,092 Area (ft^2): 97,865

Year Built: 1977 Hours per Week : 125

Facility Group: Arena

Building Components: Ice Rink x 4; Offices and Meeting Rooms

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	3,275,419	2,183,941	2,744,605
Electricity ($)	$495,301	$330,005	$402,777
Natural Gas (m^3)	321,630	288,244	324,050
Natural Gas ($)	$83,262	$76,937	$78,734
Water (m^3)	24,323	26,266	22,047
Water ($)	$33,774	$36,735	$35,744
Total Costs ($)	$612,337	$443,677	$517,255
Total e-kWh	6,652,537	5,210,504	6,147,127
Total e-kWh/m^2	731.7	573.1	676.1
GHG (kg/Yr)	726,118	623,691	711,584
GHG (kg/Yr/m^2)	*80*	*69*	*78*

Energy Measures

Ice Plant Energy Upgrades
Electrical Upgrades
Energy Upgrades for Lifecycle Replacements
Controls Upgrades
Metering & Sub-metering Equipment
Operation Optimization
Lighting Upgrades

Facility: Paramount Fine Foods Centre - Main Bowl and Community Rinks

Address	5500 Rose Cherry Place, L4Z 4B6		
Area (m^2):	23,407	Area (ft^2):	251,951
Year Built:	1998	Hours per Week :	125
Facility Group:	Arena		
Building Components:	Ice Rink x 4; Snack Bar/Lounge		

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	4,218,469	4,467,826	4,644,899
Electricity ($)	$681,640	$697,152	$670,346
Natural Gas (m^3)	361,257	327,351	383,303
Natural Gas ($)	$89,178	$89,290	$91,979
Water (m^3)	17,290	17,389	14,466
Water ($)	$30,773	$31,526	$37,298
Total Costs ($)	$801,591	$817,968	$799,623
Total e-kWh	8,011,665	7,905,009	8,669,579
Total e-kWh/m^2	342.3	337.7	370.4
GHG (kg/Yr)	835,001	779,862	892,042
GHG (kg/Yr/m^2)	*36*	*33*	*38*

Energy Measures

Facility: Port Credit Arena

Address: 40 Stavebank Rd, L5G 2T8

Area (m^2): 5,466 Area (ft^2): 53,141

Year Built: 1959 Hours per Week : 125

Facility Group: Arena

Building Components: Ice Rink

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	986,986	950,719	999,430
Electricity ($)	$152,763	$149,107	$148,999
Natural Gas (m^3)	94,600	97,474	84,379
Natural Gas ($)	$24,813	$27,117	$21,947
Water (m^3)	8,570	7,357	9,573
Water ($)	$18,830	$18,065	$23,454
Total Costs ($)	$196,405	$194,289	$194,400
Total e-kWh	1,980,284	1,974,195	1,885,413
Total e-kWh/m^2	362.3	361.2	344.9
GHG (kg/Yr)	214,420	218,549	195,541
GHG (kg/Yr/m^2)	*39*	*40*	*36*

Energy Measures

Energy Upgrades for Lifecycle Replacements
Controls Upgrades
Metering & Sub-metering Equipment
Operation Optimization
Lighting Upgrades

Facility: Tomken Twin Arena

Address	4495 Tomken Road, L4W 1J9		
Area (m^2):	6,681	Area (ft^2):	71,914
Year Built:	1990	Hours per Week :	125
Facility Group:	Arena		
Building Components:	Ice Rink x 2		

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	1,374,530	1,288,732	1,180,131
Electricity ($)	$213,759	$200,859	$177,881
Natural Gas (m^3)	182,795	190,975	177,429
Natural Gas ($)	$49,079	$52,275	$43,900
Water (m^3)	15,209	19,233	9,623
Water ($)	$32,898	$43,561	$23,292
Total Costs ($)	$295,736	$296,696	$245,074
Total e-kWh	3,293,873	3,293,974	3,043,137
Total e-kWh/m^2	493.0	493.0	455.5
GHG (kg/Yr)	395,148	407,529	378,003
GHG (kg/Yr/m^2)	*59*	*61*	*57*

Energy Measures

Ice Plant Energy Upgrades
Controls Upgrades
Metering & Sub-metering Equipment
Operation Optimization
Lighting Upgrades

5.0 COMMUNITY CENTRES AND MULTI-PURPOSE FACILITIES

5.1 SCOPE AND BOUNDARY

Community Centres and Multi-Purpose Facilities are those facilities run by the City that may have any combination of operations, such as:

- Swimming Pool
- Library
- Arena
- Gymnasium
- Fitness Centre
- Multipurpose/meeting rooms

For the purposes of this report, the City of Mississauga has 15 facilities/locations that fall under this category. They include:

- Burnhamthorpe Community Centre & Arena
- Carmen Corbasson Community Centre
- Clarkson Community Centre Library Arena & Pool
- Frank Mckechnie Community Centre
- Huron Park Community Centre Pool & Arena
- Malton Community Centre Pool & Library
- Malton Day Care Centre
- Meadowvale Community Centre Pool & Library
- Mississauga Seniors Citizen Centre
- Mississauga Valley Gymnasium
- Mississauga Valley Community Centre
- Paramount Fine Foods Centre - Fieldhouse
- Port Credit Lawn Bowling Building
- River Grove Community Centre & Pool
- South Common Community Centre Pool & Library

The above listed locations have a total floor area of approximately 96,900 square meters. This would account for 20.8% of the total building area for City of Mississauga facilities included in this Plan.

5.2 BASELINE

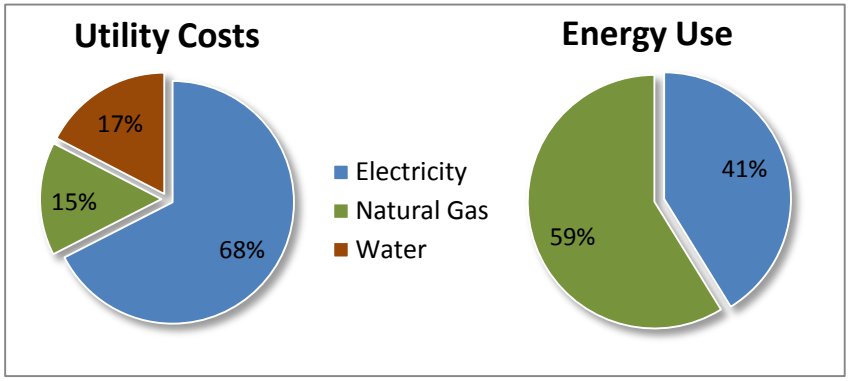
5.2.1 ENERGY USE

The energy use (combined electricity and natural gas) for **Community Centres and Multi-Purpose Facilities** was 42,992,000 equivalent kilowatt hours in 2018. Following are the key takeaways for the energy usage in 2018:

- 41% of the total energy usage was due to electricity use, which has dropped by 23.5% since 2013
- 59% of the total energy usage was due to natural gas use, which has remained consistent since 2013
- A total of $4,004,000 in utility costs was incurred, out of which 68% is attributed to electricity, 15% to natural gas, and 17% to water

Community Centres and Multi-Purpose Facilities accounted for 20.1% of the City's total utility budget for 2018.

Figure 5-1: Utility Costs and Energy Use Breakdown for Community Centres and Multi-Purpose Facilities



5.2.2 ENERGY USE INTENSITY

Energy Use Intensity (EUI) is a measurement that expresses a building's energy use as a function of its size or other characteristic. It is used to give a better picture of the energy efficiency of a facility. The lower the EUI, the more efficient the facility is.

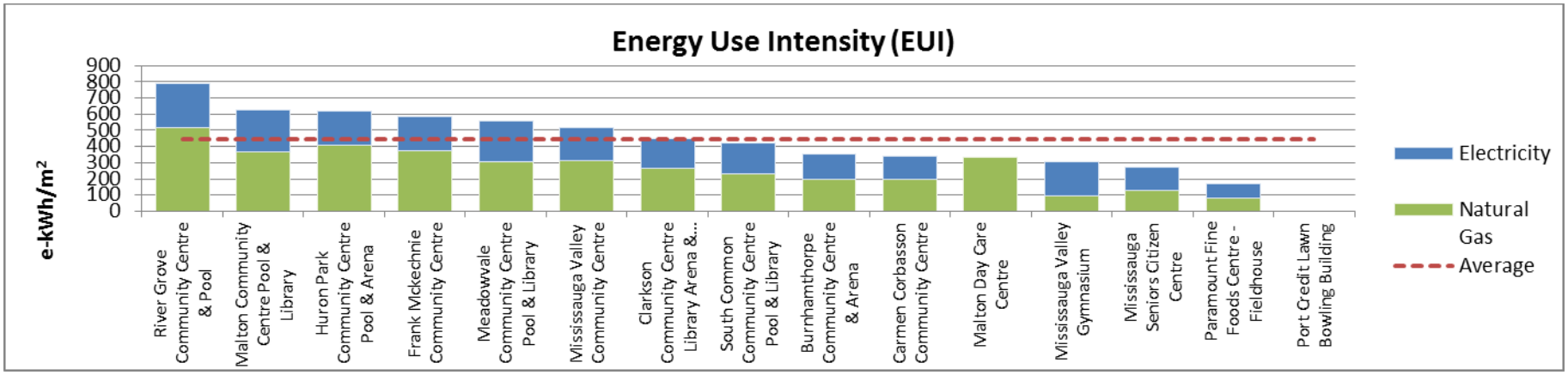
When reviewing EUI, the facility operation type and hours should be taken into account. For example, a facility that operates 24 hours a day will most likely have a higher EUI than a similar one that operates 8 hours a day. Similarly, a facility that has high energy using systems that do not contribute to the building area, such as an outdoor pool or outdoor ice rink, will have a higher EUI than a facility where those systems are located within the facility, as they would add to the facility's area footprint.

For **Community Centres and Multi-Purpose Facilities** the average EUI in 2018 was 444.8 e-kWh/m2.

The following chart shows the EUI for each facility within **Community Centres and Multi-Purpose Facilities**, and compares it to the average for the group.

Note: The Average EUI value is calculated by taking the total energy use of all facilities, and dividing by the total area of the facilities. As such, a larger facility would have a bigger impact on the average than a smaller facility.

Figure 5-2: Energy Use Intensity for Community Centres and Multi-Purpose Facilities

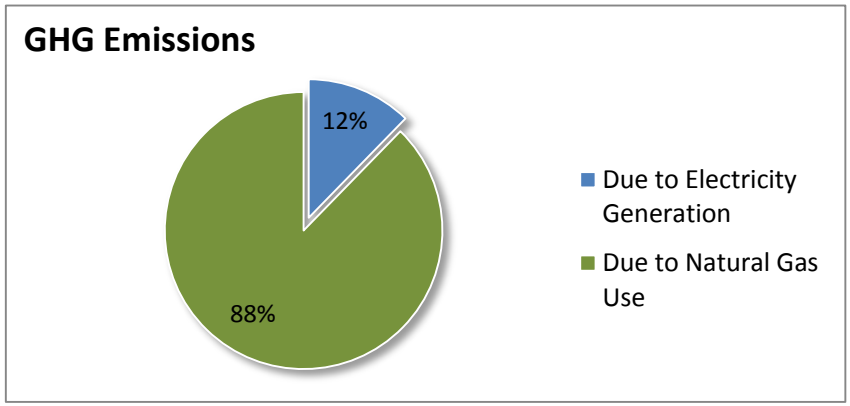


5.2.3 GREENHOUSE GAS (GHG) EMISSIONS

For 2018, **Community Centres and Multi-Purpose Facilities** emitted 5,191,000 kg (or 5,191 tonnes) of CO2 in 2018. 12.3% of these emissions were due to the generation of electricity, while the use of natural gas accounted for the remaining 87.7%.

Community Centres and Multi-Purpose Facilities accounted for 26.0% of the City's total GHG emissions for facilities included in the plan.

Figure 5-3: GHG Emissions Breakdown for Community Centres and Multi-Purpose Facilities

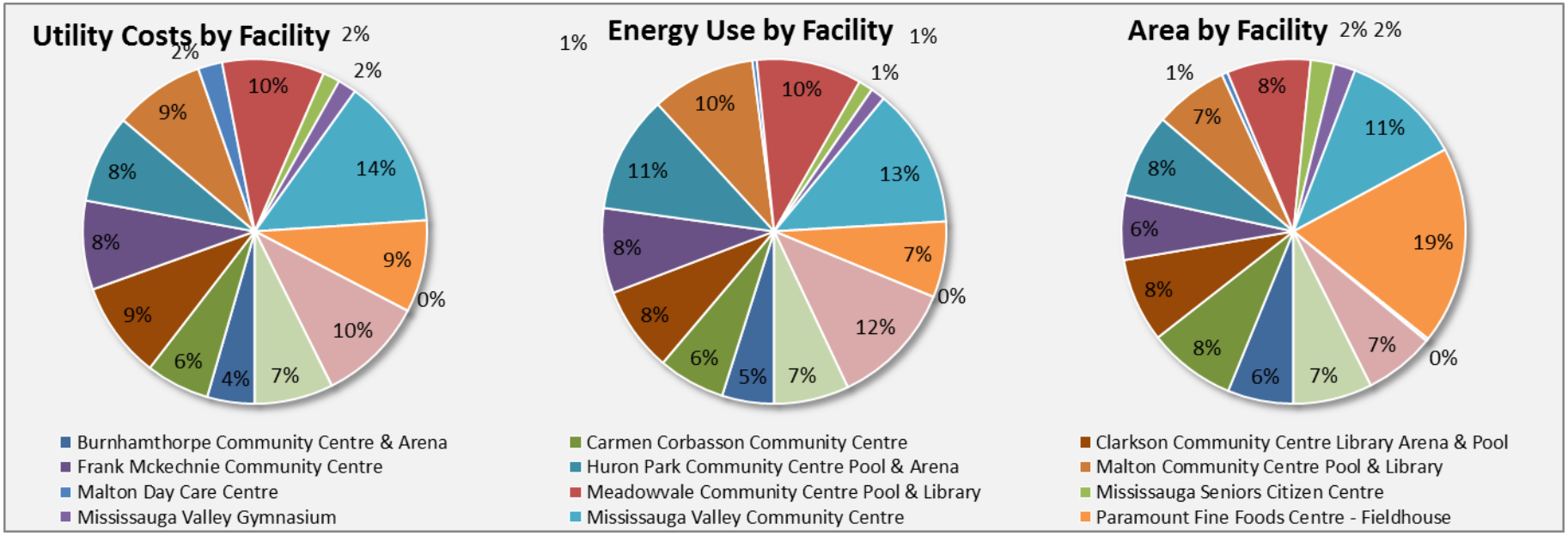


5.3 ENERGY AND GHG BREAKDOWN FOR COMMUNITY CENTRES AND MULTI-PURPOSE FACILITIES

This section provides a brief overview/recap of the Utility and GHG data for **Community Centres and Multi-Purpose Facilities**. The table below summarizes, by facility, the utility usage and GHG emissions for 2018. Following are the key takeaways:

- The top two facilities: Paramount Fine Foods Centre Fieldhouse and Mississauga Valley Community Centre in this group by area (30%) contribute towards 20% and 23% of the group's total energy consumption and utility costs respectively
- Nine (9) facilities with approximately similar areas in this group together contribute towards 77% and 71% of the group's total energy consumption and utility costs respectively
- Process loads such as ice plant, pool hot water plant, and de-humidification dominate the energy usage in this group
- For this reason, priority was given to heat recovery and electricity reduction projects for previous and future planned projects since they greatly reduce utility budget and energy usage

Figure 4-4: Utility Costs and Energy Use Breakdown by Facility



2018 Annual Report for Community Centres and Multi-Purpose Facilities

Facility	Area	Electricity		Natural Gas		Total Energy	Water		Total Costs	GHG Emissions
	m^2	kWh	$	m^3	$	e-kWh	m^3	$	$	kg
Burnhamthorpe Community Centre & Arena	6,008	904,190	$140,464	114,424	$28,436	**2,105,641**	4,306	$10,471	**$179,371**	248,926
Carmen Corbasson Community Centre	7,993	1,121,536	$170,192	151,050	$37,839	**2,707,560**	12,983	$31,467	**$239,498**	326,011
Clarkson Community Centre Library Arena & Pool	7,639	1,430,977	$216,928	191,767	$55,135	**3,444,534**	37,348	$91,457	**$363,520**	414,147
Frank Mckechnie Community Centre	5,863	1,228,811	$200,023	209,302	$52,139	**3,426,483**	30,715	$81,433	**$333,596**	440,027
Huron Park Community Centre Pool & Arena	7,626	1,604,010	$239,401	298,177	$72,995	**4,734,869**	7,811	$18,946	**$331,341**	621,597
Malton Community Centre Pool & Library	6,708	1,751,102	$261,777	233,394	$57,763	**4,201,736**	14,964	$21,305	**$340,845**	504,387
Malton Day Care Centre	535	0	$0	16,923	$5,156	**177,695**	34,793	$85,915	**$91,070**	32,002
Meadowvale Community Centre Pool & Library	7,636	1,934,661	$286,262	220,790	$53,672	**4,252,951**	18,358	$44,657	**$384,590**	487,161
Mississauga Seniors Citizen Centre	2,149	305,584	$49,689	25,981	$7,455	**578,383**	2,787	$6,762	**$63,907**	60,131
Mississauga Valley Gymnasium	1,939	403,243	$62,875	17,468	$5,446	**586,652**	679	$1,652	**$69,973**	47,548
Mississauga Valley Community Centre	10,955	2,235,334	$343,734	323,547	$78,794	**5,632,581**	60,086	$141,337	**$563,865**	692,300

Paramount Fine Foods Centre - Fieldhouse	18,000	1,651,181	$264,235	134,646	$33,563	**3,064,964**	20,131	$48,866	**$346,664**	314,058
Port Credit Lawn Bowling Building	250	0	$0	0	$0	**0**	0	$0	**$0**	0
River Grove Community Centre & Pool	6,428	1,750,838	$259,987	314,731	$77,094	**5,055,515**	26,180	$63,645	**$400,726**	658,187
South Common Community Centre Pool & Library	7,174	1,387,341	$206,839	155,767	$39,150	**3,022,894**	21,910	$48,866	**$294,855**	344,499
Totals	96,903	17,708,808	$2,702,407	2,407,967	$604,635	**42,992,457**	293,050	$696,778	**$4,003,820**	5,190,982
Usage / Costs per m^2:		184.2	$28.1	24.9	$6.3	**445**	3.0	$7.2	**$41.4**	53.7

5.4 ACTION PLAN

An action plan has been identified with the goal to save on electricity, natural gas, oil, and/or other form of energy consumption within a facility or location.

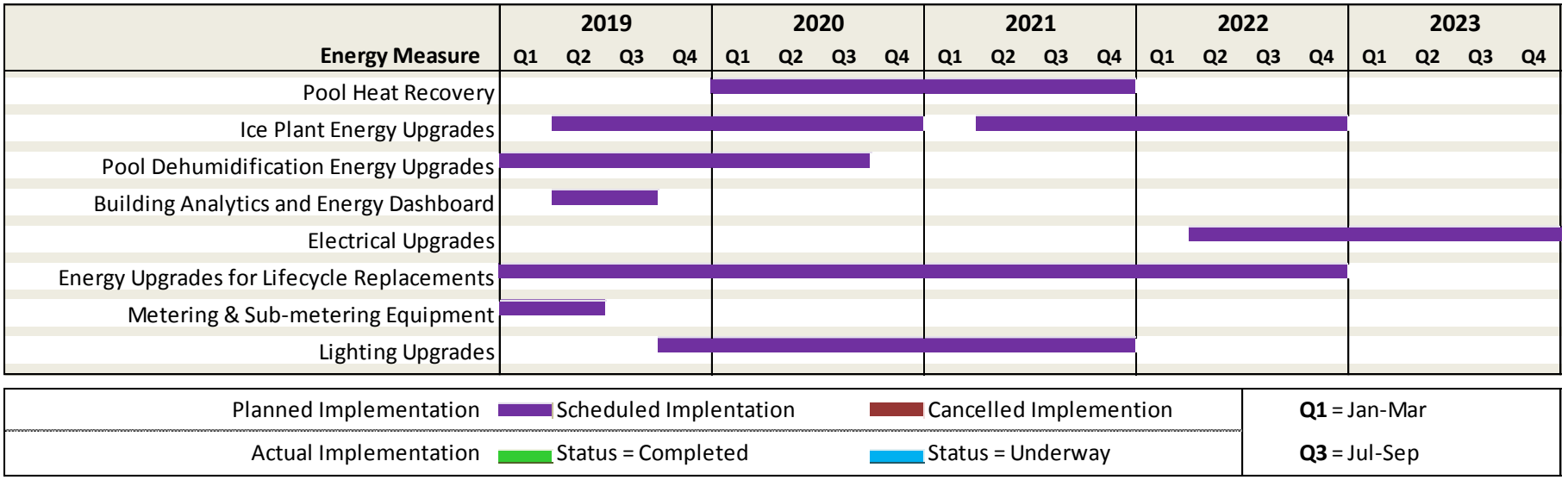
The following figure shows the various projects and initiatives that have been planned for **Community Centres and Multi-Purpose Facilities**. The chart shows what projects have been planned, when they are planned to be implemented, and the progress of implementation (if applicable). A brief description of each project has been noted below:

- **Pool Heat Recovery**: Includes recovering heat from the pool drain and transferring the recovered heat to the fresh water supply to the pool, reducing the heat load on the pool boilers
- **Ice Plant Energy Upgrades**: Includes a robust ice plant controls with the ability to modulate the equipment and reset setpoints based on varying loads and outside conditions, and cold water ice resurfacing
- **Pool Dehumidification Energy Upgrades**: Includes optimized controls for the dehumidification equipment in the pool with better modulation capabilities
- **Building Analytics and Energy Dashboard**: Is being piloted to collect, manage, and analyse data from various building systems with the capabilities of energy analysis, load profiling, facility benchmarking, asset performance tracking, fault detection, and creating energy dashboards
- **Electrical Upgrades**: Includes devices reduce the wastages associated with the distribution of the electrical feed like voltage regulation, power factor correction, efficient transformers
- **Energy Upgrades for Lifecycle Replacements**: Includes energy upgrades for high capital assets that show economic paybacks only at the time of replacement like envelope and HVAC equipment
- **Controls Upgrades**: Includes controller upgrades, optimized sequence of operations, and additional points to better manage and control building systems
- **Metering & Sub-metering**: Includes real-time monitoring of building and select components to provide the ability to analyze consumption data, identify solutions to conserve energy, and conduct measurement & verification
- **Lighting Upgrades**: Includes replacement of existing lighting technologies to newer technologies like LEDs, and better controls through localized sensors and BAS scheduling

For the chart below, the **Purple** coloured bars represent the original planned start and completion of a Measure type. The **Green** bar beneath shows the actual start and completion times for a completed measure, while the **Blue** bar shows the actual start time of a Measure that is currently being implemented, but not yet complete. Some Notes:

- A Single Measure timeline may include more than one implementation of that measure (example: In different facilities).
- Due to changing circumstances (change in operations, budget changes, new technology, etc.), a planned measure may be cancelled. These would be indicated by a **Red** plan bar on the chart.

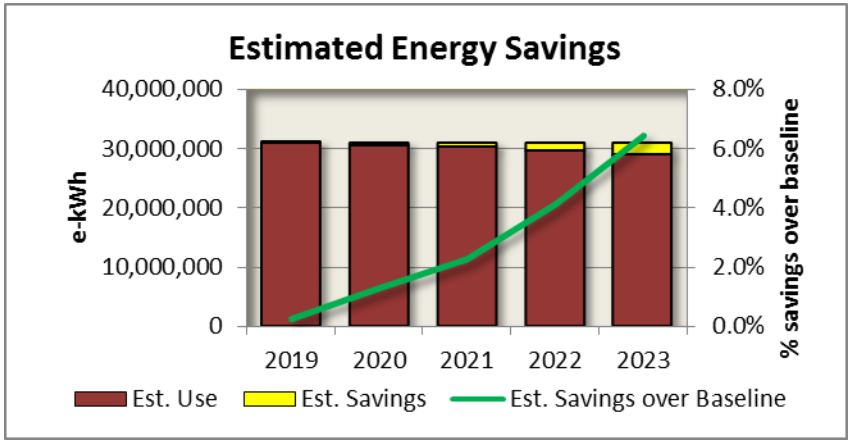
Figure 5-5: Energy Measure Implementation Plan for Community Centres and Multi-Purpose Facilities



5.5 ESTIMATED SAVINGS

At the end of the plan, **Community Centres and Multi-Purpose Facilities** are expected to save 5.2% over the base year of 2018, which amounts to a total of $102,500 from all the projects.

Figure 5-6: Energy Measure Annual Savings for Community Centres and Multi-Purpose Facilities



5.6 PROGRESS TO TARGETS

The City is targeting a 5.2% reduction in energy use in **Community Centres and Multi-Purpose Facilities** by 2023 over the base year, 2018. The reporting of energy consumption data and savings for **Community Centres and Multi-Purpose Facilities** will be based on utility meters and assembled annually. Since utility meters monitor energy consumption for the entire facility, the measurement boundary will encompass all parts of the facility. To determine the savings and fairly compare year-to-year energy consumption data, it is important to account for independent variables such as weather and occupancy and apply regression analysis to consumption data. Therefore, actual consumption data for each year starting 2019 will be adjusted to match the weather and occupancy of 2018. The figures below show the updated progress for each year against the set target.

Figure 5-7: Annual Energy Use vs Targeted Energy Use for Community Centres and Multi-Purpose Facilities

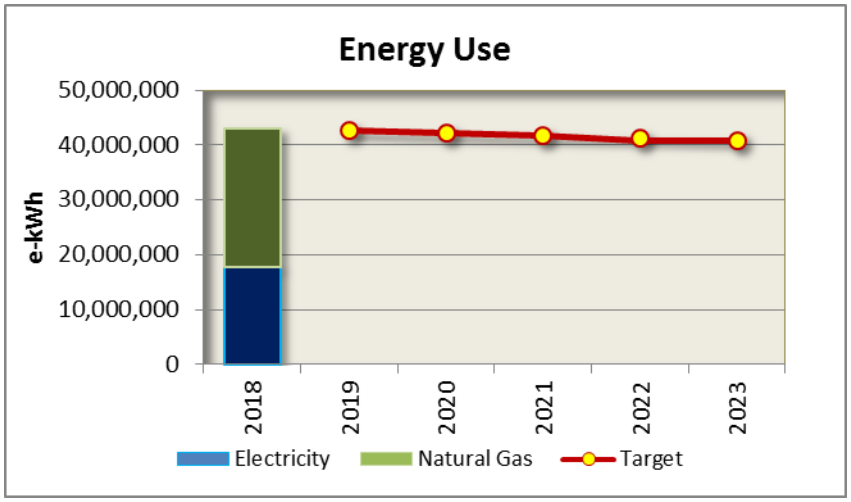
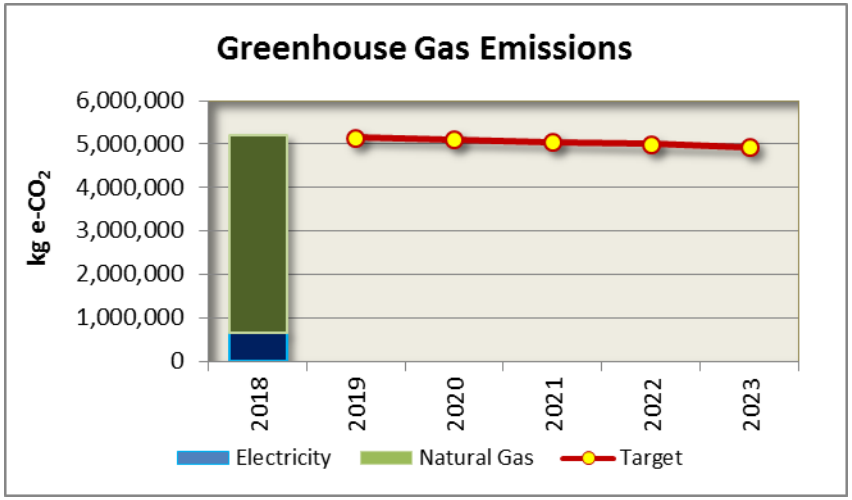


Figure 5-8: Annual GHG Emissions vs Targets for Community Centres and Multi-Purpose Facilities



5.7 FACILITY INFORMATION FOR COMMUNITY CENTRES AND MULTI-PURPOSE FACILITIES

Facility: Burnhamthorpe Community Centre & Arena

Address: 1500 Gulleden Dr, L4X 2T7

Area (m^2): 6,008 Area (ft^2): 64,670

Year Built: 1974 Hours per Week : 125

Facility Group: Community Centre

Building Components: Gymnasium; Ice Rink; Ice Rink (Outdoor); Multipurpose Rooms; Offices and Meeting Rooms

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	1,233,115	1,051,837	904,190
Electricity ($)	$192,493	$165,898	$140,464
Natural Gas (m^3)	92,671	96,233	114,424
Natural Gas ($)	$23,557	$26,082	$28,436
Water (m^3)	5,189	6,190	4,306
Water ($)	$11,260	$14,178	$10,471
Total Costs ($)	$227,310	$206,158	$179,371
Total e-kWh	2,206,158	2,062,281	2,105,641
Total e-kWh/m^2	367.2	343.3	350.5
GHG (kg/Yr)	219,632	219,842	248,926
GHG (kg/Yr/m^2)	*37*	*37*	*41*

Energy Measures

Energy Upgrades for Lifecycle Replacements
Metering & Sub-metering Equipment
Operation Optimization
Lighting Upgrades

Facility: Carmen Corbasson Community Centre

Address: 1399 Cawthra Rd, L5J 4L1

Area (m^2): 7,993 Area (ft^2): 86,036

Year Built: 1972 Hours per Week : 125

Facility Group: Community Centre

Building Components: Gymnasium; Ice Rink x 2; Multipurpose Rooms; Offices and Meeting Rooms

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	1,424,765	1,176,052	1,121,536
Electricity ($)	$218,786	$187,944	$170,192
Natural Gas (m^3)	140,238	157,312	151,050
Natural Gas ($)	$37,239	$41,666	$37,839
Water (m^3)	15,991	14,392	12,983
Water ($)	$36,754	$27,825	$31,467
Total Costs ($)	$292,778	$257,434	$239,498
Total e-kWh	2,897,259	2,827,833	2,707,560
Total e-kWh/m^2	362.5	353.8	338.7
GHG (kg/Yr)	316,481	339,816	326,011
GHG (kg/Yr/m^2)	*40*	*43*	*41*

Energy Measures

Ice Plant Energy Upgrades
Energy Upgrades for Lifecycle Replacements
Controls Upgrades
Metering & Sub-metering Equipment
Operation Optimization
Lighting Upgrades

Facility: Clarkson Community Centre Library Arena & Pool

Address: 2475 Truscott Dr, L5J 2B5

Area (m^2): 7,639 Area (ft^2): 82,226

Year Built: 1970 Hours per Week : 72

Facility Group: Community Centre

Building Components: Gymnasium; Ice Rink; Library; Multipurpose Rooms; Offices and Meeting Rooms; Pool

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	1,559,329	1,474,631	1,430,977
Electricity ($)	$244,133	$234,247	$216,928
Natural Gas (m^3)	177,130	176,160	191,767
Natural Gas ($)	$44,192	$47,960	$55,135
Water (m^3)	38,702	31,683	37,348
Water ($)	$89,016	$72,664	$91,457
Total Costs ($)	$377,341	$354,870	$363,520
Total e-kWh	3,419,193	3,324,308	3,444,534
Total e-kWh/m^2	447.6	435.2	450.9
GHG (kg/Yr)	391,089	386,205	414,147
GHG (kg/Yr/m^2)	*51*	*51*	*54*

Energy Measures

Pool Heat Recovery
Ice Plant Energy Upgrades
Pool Dehumidification Energy Upgrades
Electrical Upgrades
Energy Upgrades for Lifecycle Replacements
Controls Upgrades
Metering & Sub-metering Equipment
Operation Optimization
Lighting Upgrades

Facility: Frank Mckechnie Community Centre

Address: 310 Bristol Road East, L4Z 3V5

Area (m^2): 5,863 Area (ft^2): 63,109

Year Built: 2000 Hours per Week : 72

Facility Group: Community Centre

Building Components: Gymnasium; Library; Multipurpose Rooms; Offices and Meeting Rooms; Pool

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	1,377,593	1,299,277	1,228,811
Electricity ($)	$215,726	$205,907	$200,023
Natural Gas (m^3)	218,755	224,128	209,302
Natural Gas ($)	$56,903	$61,402	$52,139
Water (m^3)	39,761	39,273	30,715
Water ($)	$66,701	$83,391	$81,433
Total Costs ($)	$339,330	$350,700	$333,596
Total e-kWh	3,674,518	3,652,617	3,426,483
Total e-kWh/m^2	626.7	623.0	584.4
GHG (kg/Yr)	463,258	470,599	440,027
GHG (kg/Yr/m^2)	*79*	*80*	*75*

Energy Measures

Pool Heat Recovery
Energy Management Information System
Energy Upgrades for Lifecycle Replacements
Metering & Sub-metering Equipment
Operation Optimization
Lighting Upgrades

Facility: Huron Park Community Centre Pool & Arena

Address	830 Paisley Blvd W, L5C 3P5		
Area (m^2):	7,626	Area (ft^2):	82,086
Year Built:	1967	Hours per Week :	125
Facility Group:	Community Centre		
Building Components:	Fitness Centre; Gymnasium; Ice Rink; Multipurpose Rooms; Offices and Meeting Rooms; Pool		

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	1,608,797	1,488,365	1,604,010
Electricity ($)	$247,820	$231,090	$239,401
Natural Gas (m^3)	316,674	294,417	298,177
Natural Gas ($)	$81,827	$79,444	$72,995
Water (m^3)	10,973	9,682	7,811
Water ($)	$28,552	$22,121	$18,946
Total Costs ($)	$358,199	$332,655	$331,341
Total e-kWh	4,933,875	4,579,747	4,734,869
Total e-kWh/m^2	647.0	600.5	620.9
GHG (kg/Yr)	656,747	610,324	621,597
GHG (kg/Yr/m^2)	*86*	*80*	*82*

Energy Measures

Pool Heat Recovery
Ice Plant Energy Upgrades
Pool Dehumidification Energy Upgrades
Energy Upgrades for Lifecycle Replacements
Controls Upgrades
Metering & Sub-metering Equipment
Operation Optimization
Lighting Upgrades

Facility: Malton Community Centre Pool & Library

Address: 3540 Morningstar Dr, L4T 1Y2

Area (m^2): 6,708 Area (ft^2): 80,772

Year Built: 1977 Hours per Week : 125

Facility Group: Community Centre

Building Components: Fitness Centre; Gymnasium; Library; Multipurpose Rooms; Offices and Meeting Rooms; Pool

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	1,857,449	1,970,007	1,751,102
Electricity ($)	$288,263	$289,203	$261,777
Natural Gas (m^3)	221,285	216,424	233,394
Natural Gas ($)	$57,642	$59,513	$57,763
Water (m^3)	13,663	13,201	14,964
Water ($)	$16,936	$17,292	$21,305
Total Costs ($)	$362,840	$366,008	$340,845
Total e-kWh	4,180,940	4,242,455	4,201,736
Total e-kWh/m^2	623.3	632.4	626.4
GHG (kg/Yr)	485,318	480,177	504,387
GHG (kg/Yr/m^2)	*72*	*72*	*75*

Energy Measures

Facility: Malton Day Care Centre

Address: 3500 Morningstar Dr, L4T 1Y2

Area (m^2): 535 Area (ft^2): 5,759

Year Built: 1977 Hours per Week : 55

Facility Group: Community Centre

Building Components: Day Care

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	0	0	0
Electricity ($)	$0	$0	$0
Natural Gas (m^3)	16,860	15,299	16,923
Natural Gas ($)	$5,164	$4,697	$5,156
Water (m^3)	38,831	33,865	34,793
Water ($)	$85,873	$78,156	$85,915
Total Costs ($)	$91,036	$82,854	$91,070
Total e-kWh	177,032	160,637	177,695
Total e-kWh/m^2	330.9	300.3	332.1
GHG (kg/Yr)	31,883	28,930	32,002
GHG (kg/Yr/m^2)	*60*	*54*	*60*

Energy Measures

Facility: Meadowvale Community Centre Pool & Library

Address: 6655 Glen Erin Dr, L5N 3L4

Area (m^2): 7,636 Area (ft^2): 82,163

Year Built: 2016 Hours per Week :

Facility Group: Community Centre

Building Components: Fitness Centre; Multipurpose Rooms; Offices and Meeting Rooms; Pool

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	925,304	1,965,207	1,934,661
Electricity ($)	$148,254	$293,065	$286,262
Natural Gas (m^3)	148,353	246,903	220,790
Natural Gas ($)	$34,763	$61,269	$53,672
Water (m^3)	5,812	20,799	18,358
Water ($)	$12,709	$47,819	$44,657
Total Costs ($)	$195,726	$402,153	$384,590
Total e-kWh	2,483,008	4,557,689	4,252,951
Total e-kWh/m^2	325.2	596.9	557.0
GHG (kg/Yr)	313,846	537,641	487,161
GHG (kg/Yr/m^2)	*41*	*70*	*64*

Energy Measures

Facility: Mississauga Seniors Citizen Centre

Address: 1389 Cawthra Rd, L5J 4L1

Area (m^2): 2,149 Area (ft^2): 23,132

Year Built: Hours per Week :

Facility Group: Community Centre

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	241,974	284,650	305,584
Electricity ($)	$42,262	$47,800	$49,689
Natural Gas (m^3)	25,241	24,619	25,981
Natural Gas ($)	$7,119	$7,313	$7,455
Water (m^3)	1,239	1,606	2,787
Water ($)	$2,704	$3,675	$6,762
Total Costs ($)	$52,086	$58,788	$63,907
Total e-kWh	507,005	543,150	578,383
Total e-kWh/m^2	235.9	252.7	269.1
GHG (kg/Yr)	56,442	56,802	60,131
GHG (kg/Yr/m^2)	*26*	*26*	*28*

Energy Measures

Facility: Mississauga Valley Gymnasium

Address: 1395 Mississauga Valley Blvd, L5A 3R8

Area (m^2): 1,939 Area (ft^2): 20,871

Year Built: 1984 Hours per Week : 98

Facility Group: Community Centre

Building Components: Gymnasium

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	352,958	383,438	403,243
Electricity ($)	$60,596	$62,933	$62,875
Natural Gas (m^3)	18,724	17,593	17,468
Natural Gas ($)	$5,459	$5,595	$5,446
Water (m^3)	2,289	928	679
Water ($)	$5,023	$2,119	$1,652
Total Costs ($)	$71,078	$70,646	$69,973
Total e-kWh	549,560	568,167	586,652
Total e-kWh/m^2	283.4	293.0	302.6
GHG (kg/Yr)	48,114	47,073	47,548
GHG (kg/Yr/m^2)	*25*	*24*	*25*

Energy Measures

Facility: Mississauga Valley Community Centre

Address	1275 Mississauga Valley Blvd, L5A 3R8
Area (m^2):	10,955
Area (ft^2):	117,919
Year Built:	1977
Hours per Week :	138
Facility Group:	Community Centre
Building Components:	Day Care; Fitness Centre; Ice Rink; Library; Multipurpose Rooms; Offices and Meeting Rooms; Pool

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	2,323,570	2,160,932	2,235,334
Electricity ($)	$380,756	$354,502	$343,734
Natural Gas (m^3)	297,755	299,508	323,547
Natural Gas ($)	$75,424	$80,303	$78,794
Water (m^3)	63,873	52,296	60,086
Water ($)	$135,487	$115,968	$141,337
Total Costs ($)	$591,667	$550,772	$563,865
Total e-kWh	5,449,996	5,305,762	5,632,581
Total e-kWh/m^2	497.5	484.3	514.2
GHG (kg/Yr)	646,703	644,163	692,300
GHG (kg/Yr/m^2)	*59*	*59*	*63*

Energy Measures

Ice Plant Energy Upgrades
Pool Dehumidification Energy Upgrades
Electrical Upgrades
Controls Upgrades
Metering & Sub-metering Equipment
Operation Optimization
Lighting Upgrades

Facility: Paramount Fine Foods Centre - Fieldhouse

Address	5600 Rose Cherry Place, L4Z 4B6		
Area (m^2):	18,000	Area (ft^2):	193,750
Year Built:	2007	Hours per Week :	125
Facility Group:	Community Centre		
Building Components:	Fitness Centre; Gymnasium; Gymnastics Centre; Snack Bar/Lounge; Soccer Field (Indoor)		

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	2,391,101	2,171,313	1,651,181
Electricity ($)	$395,339	$349,733	$264,235
Natural Gas (m^3)	121,396	142,257	134,646
Natural Gas ($)	$30,245	$37,652	$33,563
Water (m^3)	13,540	19,296	20,131
Water ($)	$29,832	$41,047	$48,866
Total Costs ($)	$455,415	$428,431	$346,664
Total e-kWh	3,665,758	3,665,007	3,064,964
Total e-kWh/m^2	203.7	203.6	170.3
GHG (kg/Yr)	315,639	347,174	314,058
GHG (kg/Yr/m^2)	*18*	*19*	*17*

Energy Measures

Facility: Port Credit Lawn Bowling Building

Address: 1389 Cawthra Rd, L5J 4L1

Area (m^2): 250 Area (ft^2): 2,691

Year Built: 1992 Hours per Week : 72

Facility Group: Community Centre

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	0	0	0
Electricity ($)	$0	$0	$0
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$0	$0	$0
Total e-kWh	0	0	0
Total e-kWh/m^2	0.0	0.0	0.0
GHG (kg/Yr)	0	0	0
GHG (kg/Yr/m^2)	*0*	*0*	*0*

Energy Measures

Facility: River Grove Community Centre & Pool

Address: 5800 River Grove Avenue, L5M 4R8

Area (m^2): 6,428 Area (ft^2): 68,200

Year Built: 1996 Hours per Week : 100

Facility Group: Community Centre

Building Components: Fitness Centre; Gymnasium; Multipurpose Rooms; Offices and Meeting Rooms; Pool

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	2,032,046	1,792,662	1,750,838
Electricity ($)	$314,410	$279,605	$259,987
Natural Gas (m^3)	329,800	305,325	314,731
Natural Gas ($)	$83,340	$85,420	$77,094
Water (m^3)	28,294	29,948	26,180
Water ($)	$61,618	$68,448	$63,645
Total Costs ($)	$459,368	$433,473	$400,726
Total e-kWh	5,494,948	4,998,570	5,055,515
Total e-kWh/m^2	854.8	777.6	786.5
GHG (kg/Yr)	696,806	641,904	658,187
GHG (kg/Yr/m^2)	*108*	*100*	*102*

Energy Measures

Pool Heat Recovery
Pool Dehumidification Energy Upgrades
Electrical Upgrades
Controls Upgrades
Metering & Sub-metering Equipment
Operation Optimization
Lighting Upgrades

Facility: South Common Community Centre Pool & Library

Address: 2233 South Millway Dr, L5L 3H7

Area (m^2): 7,174 Area (ft^2): 70,482

Year Built: 1981 Hours per Week : 100

Facility Group: Community Centre

Building Components: Fitness Centre; Gymnasium; Library; Multipurpose Rooms; Offices and Meeting Rooms; Pool

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	1,417,809	1,375,795	1,387,341
Electricity ($)	$224,529	$208,893	$206,839
Natural Gas (m^3)	162,626	169,643	155,767
Natural Gas ($)	$44,259	$46,180	$39,150
Water (m^3)	20,682	23,407	21,910
Water ($)	$36,815	$52,429	$48,866
Total Costs ($)	$305,603	$307,502	$294,855
Total e-kWh	3,125,379	3,157,050	3,022,894
Total e-kWh/m^2	435.7	440.1	421.4
GHG (kg/Yr)	358,566	370,324	344,499
GHG (kg/Yr/m^2)	*50*	*52*	*48*

Energy Measures

6.0 CULTURAL AND PERFORMING ARTS

6.1 SCOPE AND BOUNDARY

For the purposes of this report, the City of Mississauga has 8 facilities/locations that fall under this category. They include:

- Benares Estate - House
- Benares Estate - Visitor Centre
- Bradley Museum - Barn
- Bradley Museum - Log Cabin
- Bradley Museum - Museum
- Bradley Museum - The Anchorage
- Living Arts Centre
- Meadowvale Community Theatre

The above listed locations have a total floor area of approximately 37,700 square meters. This would account for 8.1% of the total building area for City of Mississauga facilities included in this Plan.

6.2 BASELINE

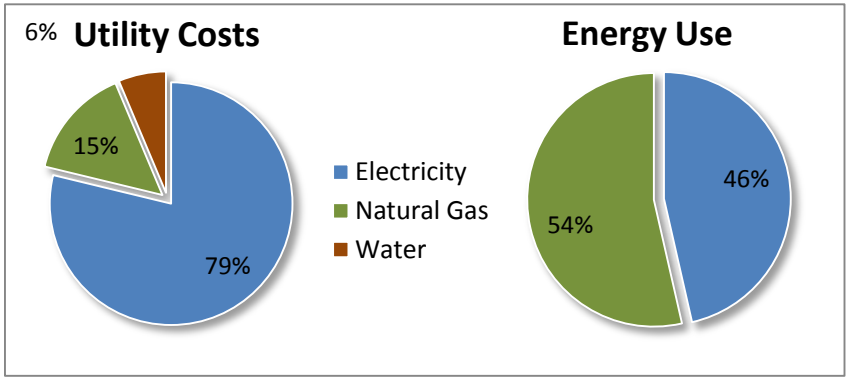
6.2.1 ENERGY USE

The energy use (combined electricity and natural gas) for **Cultural and Performing Arts** was 9,118,000 equivalent kilowatt hours in 2018. Following are the key takeaways for the energy usage in 2018:

- 46% of the total energy usage was due to electricity use, which has increased by 5.6% since 2013
- 54% of the total energy usage was due to natural gas use, which has dropped by 7.3% since 2013
- A total of $810,000 in utility costs was incurred, out of which 79% is attributed to electricity, 15% to natural gas, and 6% to water

Cultural and Performing Arts accounted for 4.5% of the City's total utility budget for 2018.

Figure 6-1: Utility Costs and Energy Use Breakdown for Community Centres and Multi-Purpose Facilities



6.2.2 ENERGY USE INTENSITY

Energy Use Intensity (EUI) is a measurement that expresses a building's energy use as a function of its size or other characteristic. It is used to give a better picture of the energy efficiency of a facility. The lower the EUI, the more efficient the facility is.

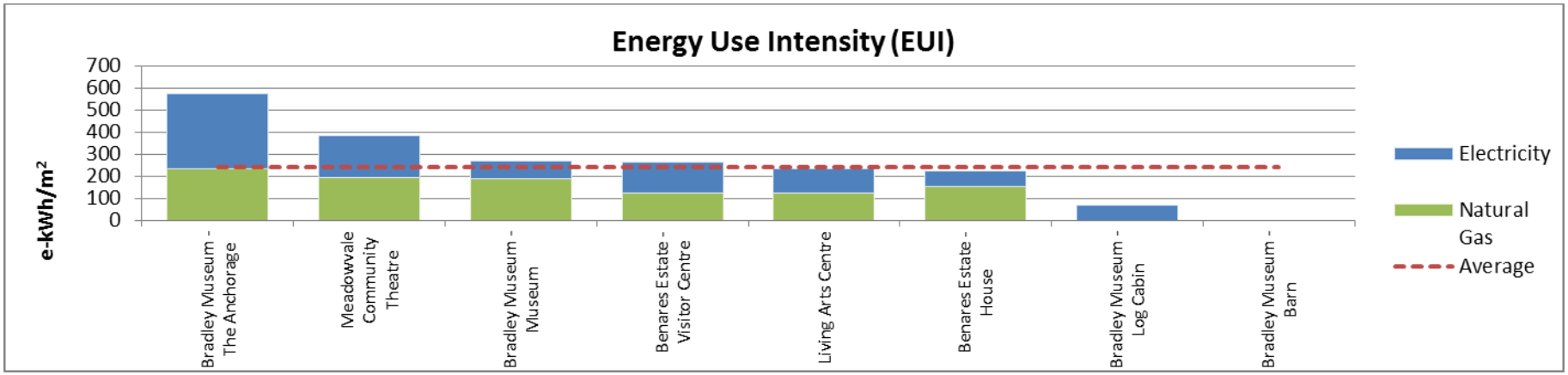
When reviewing EUI, the facility operation type and hours should be taken into account. For example, a facility that operates 24 hours a day will most likely have a higher EUI than a similar one that operates 8 hours a day. Similarly, a facility that has high energy using systems that do not contribute to the building area, such as an outdoor pool or outdoor ice rink, will have a higher EUI than a facility where those systems are located within the facility, as they would add to the facility's area footprint.

For **Cultural and Performing Arts** the average EUI in 2018 was 241.1 e-kWh/m2.

The following chart shows the EUI for each facility within **Cultural and Performing Arts**, and compares it to the average for the group.

Note: The Average EUI value is calculated by taking the total energy use of all facilities, and dividing by the total area of the facilities. As such, a larger facility would have a bigger impact on the average than a smaller facility.

Figure 6-2: Energy Use Intensity for Cultural and Performing Arts

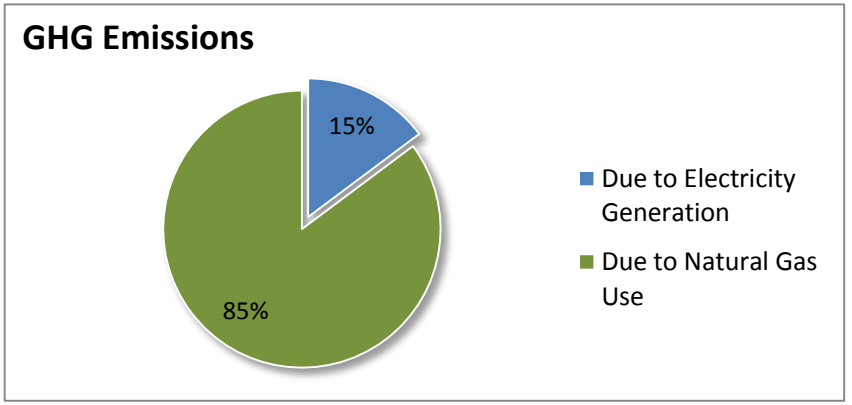


6.2.3 GREENHOUSE GAS (GHG) EMISSIONS

For 2018, **Cultural and Performing Arts** emitted 1,032,000 kg (or 1,032 tonnes) of CO2 in 2018. 14.8% of these emissions were due to the generation of electricity, while the use of natural gas accounted for the remaining 85.2%.

Cultural and Performing Arts accounted for 5.2% of the City's total GHG emissions for facilities included in the plan.

Figure 6-3: GHG Emissions Breakdown for Cultural and Performing Arts

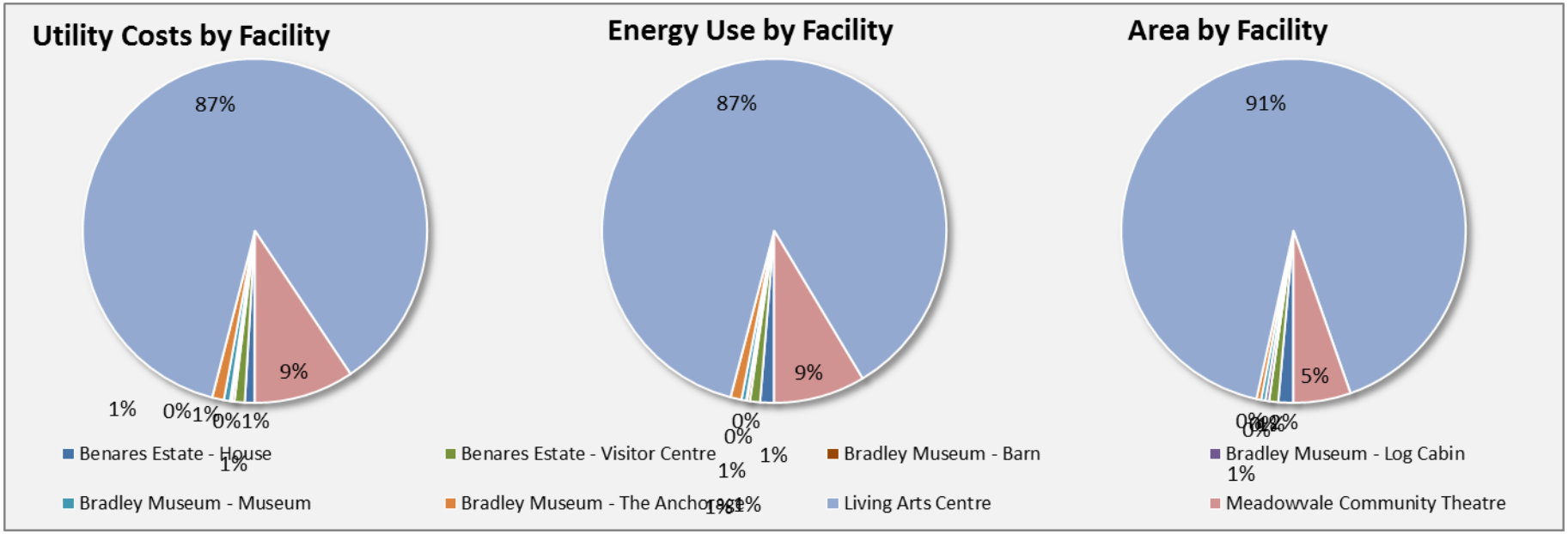


6.3 ENERGY AND GHG BREAKDOWN FOR CULTURAL AND PERFORMING ARTS

This section provides a brief overview/recap of the Utility and GHG data for **Cultural and Performing Arts**. The table below summarizes, by facility, the utility usage and GHG emissions for 2018. Following are the key takeaways:

- Living Arts Centre is the largest facility by area in the group and contributes towards 87% of the energy consumption and utility costs in the group
- Meadowvale Community Theatre is the second largest facility and only contributes towards 9% of the energy consumption and utility costs in the group
- For this reason, priority was given to electricity reduction projects at Living Arts Centre for previous and future planned projects since they greatly reduce utility budget and energy usage

Figure 4-4: Utility Costs and Energy Use Breakdown by Facility



2018 Annual Report for Cultural and Performing Arts

Facility	Area	Electricity		Natural Gas		Total Energy	Water		Total Costs	GHG Emissions
	m^2	kWh	$	m^3	$	e-kWh	m^3	$	$	kg
Benares Estate - House	535	37,477	$4,584	7,852	$2,992	**119,921**	35	$81	**$7,656**	16,197
Benares Estate - Visitor Centre	327	45,615	$5,531	3,853	$2,002	**86,074**	114	$277	**$7,810**	8,929
Bradley Museum - Barn	0	3,942	$524	1,873	$1,311	**23,611**	0	$0	**$1,835**	3,684
Bradley Museum - Log Cabin	126	8,734	$1,466	0	$0	**8,734**	0	$0	**$1,466**	314
Bradley Museum - Museum	151	12,084	$1,807	2,701	$1,606	**40,439**	527	$1,290	**$4,703**	5,542
Bradley Museum - The Anchorage	164	55,963	$7,080	3,629	$1,862	**94,064**	0	$0	**$8,942**	8,877
Living Arts Centre	34,387	3,678,408	$553,264	408,025	$100,590	**7,962,667**	19,498	$47,747	**$701,601**	903,997
Meadowvale Community Theatre	2,028	392,046	$63,802	37,193	$10,145	**782,569**	809	$1,954	**$75,901**	84,445
Totals	37,718	4,234,268	$638,057	465,125	$120,508	**9,118,080**	20,984	$51,349	**$809,915**	1,031,985
Usage / Costs per m^2:		112.2	$16.9	12.3	$3.2	**241**	0.6	$1.4	**$21.4**	27.3

6.4 ACTION PLAN

An action plan has been identified with the goal to save on electricity, natural gas, oil, and/or other form of energy consumption within a facility or location.

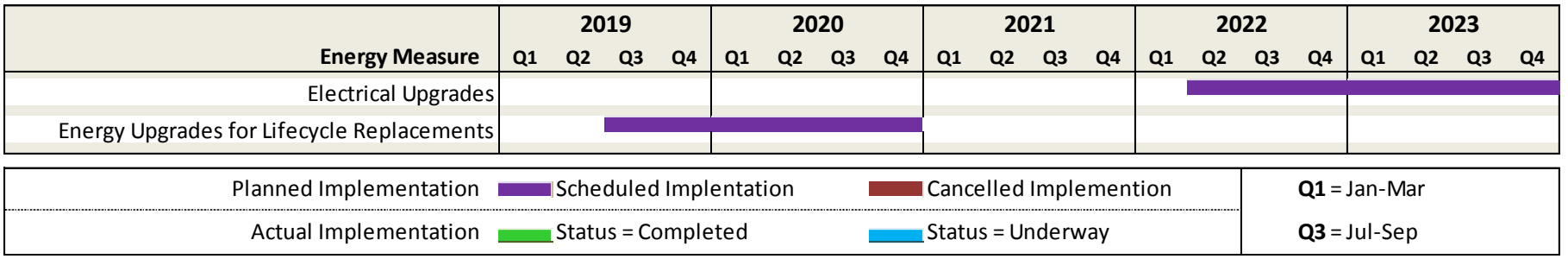
The following figure shows the various projects and initiatives that have been planned for **Cultural and Performing Arts**. The chart shows what projects have been planned, when they are planned to be implemented, and the progress of implementation (if applicable). A brief description of each project has been noted below:

- **Electrical Upgrades**: Includes devices reduce the wastages associated with the distribution of the electrical feed like voltage regulation, power factor correction, efficient transformers
- **Energy Upgrades for Lifecycle Replacements**: Includes energy upgrades for high capital assets that show economic paybacks only at the time of replacement like envelope and HVAC equipment

For the chart below, the **Purple** coloured bars represent the original planned start and completion of a Measure type. The **Green** bar beneath shows the actual start and completion times for a completed measure, while the **Blue** bar shows the actual start time of a Measure that is currently being implemented, but not yet complete. Some Notes:

- A Single Measure timeline may include more than one implementation of that measure (example: In different facilities).
- Due to changing circumstances (change in operations, budget changes, new technology, etc.), a planned measure may be cancelled. These would be indicated by a **Red** plan bar on the chart.

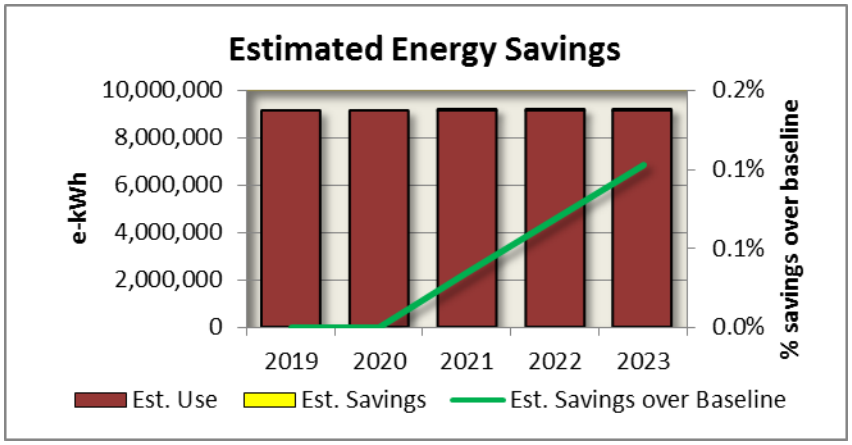
Figure 6-5: Energy Measure Implementation Plan for Cultural and Performing Arts



6.5 ESTIMATED SAVINGS

At the end of the plan, **Cultural and Performing Arts** are expected to save 0.1% over the base year of 2018, which amounts to a total of $250 from all the projects.

Figure 6-6: Energy Measure Annual Savings for Cultural and Performing Arts



6.6 PROGRESS TO TARGETS

The City is targeting a 0.1% reduction in energy use in **Cultural and Performing Arts** by 2023 over the base year, 2018. The reporting of energy consumption data and savings for **Cultural and Performing Arts** will be based on utility meters and assembled annually. Since utility meters monitor energy consumption for the entire facility, the measurement boundary will encompass all parts of the facility. To determine the savings and fairly compare year-to-year energy consumption data, it is important to account for independent variables such as weather and occupancy and apply regression analysis to consumption data. Therefore, actual consumption data for each year starting 2019 will be adjusted to match the weather and occupancy of 2018. The figures below show the updated progress for each year against the set target.

Figure 6-7: Annual Energy Use vs Targeted Energy Use for Cultural and Performing Arts

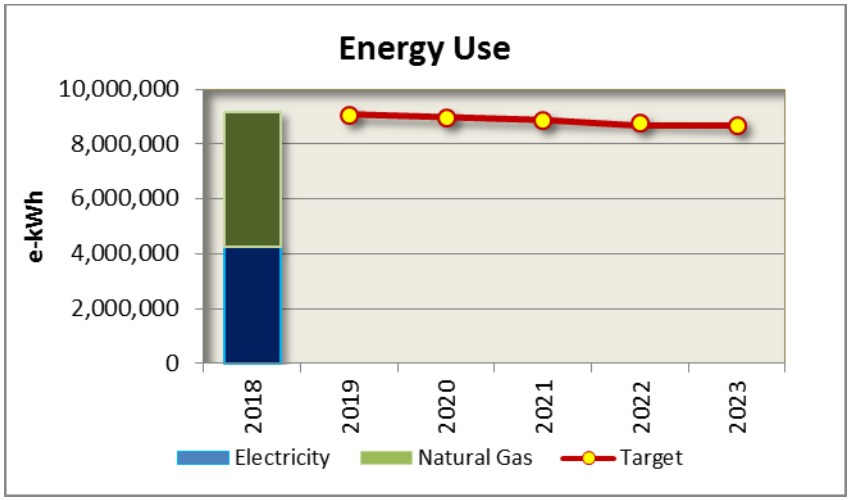
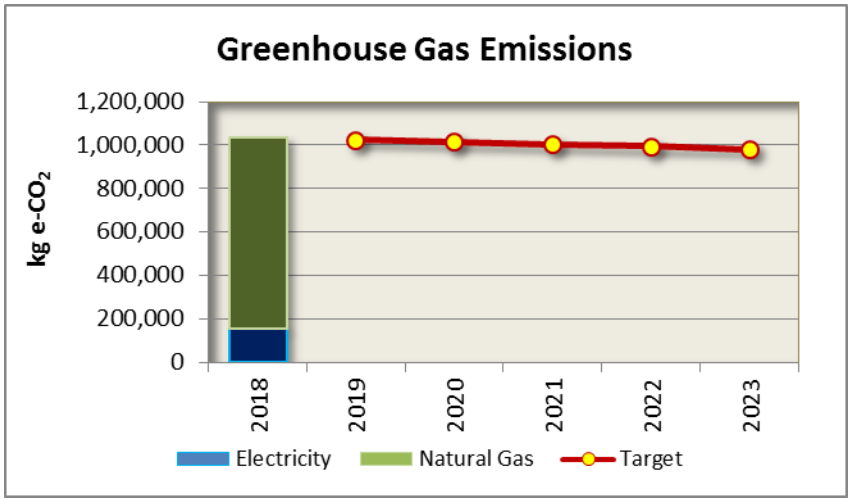


Figure 6-8: Annual GHG Emissions vs Targets for Cultural and Performing Arts



6.7 FACILITY INFORMATION FOR CULTURAL AND PERFORMING ARTS

Facility: Benares Estate - House

Address 1503 Clarkson Rd, L5J 2W8

Area (m^2): 535 Area (ft^2): 5,759

Year Built: 1857 Hours per Week : 50

Facility Group: Culture

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	32,504	34,416	37,477
Electricity ($)	$5,510	$5,210	$4,584
Natural Gas (m^3)	8,581	7,397	7,852
Natural Gas ($)	$2,570	$2,920	$2,992
Water (m^3)	863	367	35
Water ($)	$1,782	$793	$81
Total Costs ($)	$9,862	$8,922	$7,656
Total e-kWh	122,599	112,086	119,921
Total e-kWh/m^2	229.2	209.5	224.2
GHG (kg/Yr)	17,396	15,227	16,197
GHG (kg/Yr/m^2)	*33*	*28*	*30*

Energy Measures

Facility: Benares Estate - Visitor Centre

Address: 1507 Clarkson Rd, L5J 2W8

Area (m^2): 327 Area (ft^2): 3,520

Year Built: 1995 Hours per Week : 50

Facility Group: Culture

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	48,151	48,533	45,615
Electricity ($)	$8,187	$6,013	$5,531
Natural Gas (m^3)	3,825	3,086	3,853
Natural Gas ($)	$1,882	$1,718	$2,002
Water (m^3)	214	232	114
Water ($)	$477	$533	$277
Total Costs ($)	$10,546	$8,264	$7,810
Total e-kWh	88,309	80,935	86,074
Total e-kWh/m^2	270.1	247.5	263.2
GHG (kg/Yr)	8,966	7,583	8,929
GHG (kg/Yr/m^2)	*27*	*23*	*27*

Energy Measures

Energy Upgrades for Lifecycle Replacements

Facility: Bradley Museum - Barn

Address: 1620 Orr Rd, L5J 4T2

Area (m^2): Area (ft^2):

Year Built: 1830 Hours per Week : 50

Facility Group: Culture

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	3,965	3,942	3,942
Electricity ($)	$693	$623	$524
Natural Gas (m^3)	3,325	2,676	1,873
Natural Gas ($)	$1,745	$1,604	$1,311
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$2,437	$2,227	$1,835
Total e-kWh	38,881	32,044	23,611
Total e-kWh/m^2	N/A	N/A	N/A
GHG (kg/Yr)	6,431	5,203	3,684
GHG (kg/Yr/m^2)	*N/A*	*N/A*	*N/A*

Energy Measures

Facility: Bradley Museum - Log Cabin

Address: 1600 Orr Rd, L5J 4T2

Area (m^2): 126 Area (ft^2): 0

Year Built: 1830 Hours per Week : 50

Facility Group: Culture

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	12,068	11,100	8,734
Electricity ($)	$2,404	$1,928	$1,466
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$2,404	$1,928	$1,466
Total e-kWh	12,068	11,100	8,734
Total e-kWh/m^2	95.8	88.1	69.3
GHG (kg/Yr)	434	400	314
GHG (kg/Yr/m^2)	*3*	*3*	*2*

Energy Measures

Facility: Bradley Museum - Museum

Address 1620 Orr Rd, L5J 4T2

Area (m^2): 151 Area (ft^2): 0

Year Built: 1825 Hours per Week : 50

Facility Group: Culture

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	12,005	11,308	12,084
Electricity ($)	$2,320	$2,029	$1,807
Natural Gas (m^3)	2,721	2,737	2,701
Natural Gas ($)	$1,580	$1,614	$1,606
Water (m^3)	1,126	631	527
Water ($)	$2,477	$1,453	$1,290
Total Costs ($)	$6,376	$5,095	$4,703
Total e-kWh	40,580	40,042	40,439
Total e-kWh/m^2	268.7	265.2	267.8
GHG (kg/Yr)	5,578	5,582	5,542
GHG (kg/Yr/m^2)	*37*	*37*	*37*

Energy Measures

Facility: Bradley Museum - The Anchorage

Address: 1610 Orr Rd, L5J 4T2

Area (m^2): 164 Area (ft^2): 0

Year Built: 1830 Hours per Week : 50

Facility Group: Culture

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	55,903	62,310	55,963
Electricity ($)	$9,059	$9,214	$7,080
Natural Gas (m^3)	4,351	4,641	3,629
Natural Gas ($)	$2,027	$2,198	$1,862
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$11,086	$11,412	$8,942
Total e-kWh	101,590	111,039	94,064
Total e-kWh/m^2	619.5	677.1	573.6
GHG (kg/Yr)	10,241	11,019	8,877
GHG (kg/Yr/m^2)	*62*	*67*	*54*

Energy Measures

Facility: Living Arts Centre

Address: 4141 Living Arts Dr, L5B 4B8

Area (m^2): 34,387 Area (ft^2): 370,139

Year Built: 1997 Hours per Week : 98

Facility Group: Culture

Building Components: Offices and Meeting Rooms; Restaurant; Theatre; Underground Parking

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	3,602,374	3,553,875	3,678,408
Electricity ($)	$572,625	$552,096	$553,264
Natural Gas (m^3)	526,798	488,348	408,025
Natural Gas ($)	$125,142	$125,831	$100,590
Water (m^3)	19,436	16,058	19,498
Water ($)	$42,533	$36,745	$47,747
Total Costs ($)	$740,300	$714,673	$701,601
Total e-kWh	9,133,748	8,681,528	7,962,667
Total e-kWh/m^2	265.6	252.5	231.6
GHG (kg/Yr)	1,125,860	1,051,405	903,997
GHG (kg/Yr/m^2)	*33*	*31*	*26*

Energy Measures

Metering & Sub-metering Equipment
Operation Optimization
Lighting Upgrades

Facility: Meadowvale Community Theatre

Address: 6315 Montevideo Rd, L5N 4G7

Area (m^2): 2,028 Area (ft^2): 21,829

Year Built: 1981 Hours per Week : 40

Facility Group: Culture

Building Components: Theatre

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	414,977	440,452	392,046
Electricity ($)	$71,430	$70,531	$63,802
Natural Gas (m^3)	47,424	36,884	37,193
Natural Gas ($)	$9,955	$10,883	$10,145
Water (m^3)	887	1,035	809
Water ($)	$1,922	$2,363	$1,954
Total Costs ($)	$83,307	$83,777	$75,901
Total e-kWh	912,925	827,729	782,569
Total e-kWh/m^2	450.2	408.2	385.9
GHG (kg/Yr)	104,617	85,603	84,445
GHG (kg/Yr/m^2)	*52*	*42*	*42*

Energy Measures

Electrical Upgrades

7.0 FIRE STATIONS AND EMERGENCY SERVICES

7.1 SCOPE AND BOUNDARY

This group consist of the City of Mississauga's fire stations. Some of the fire stations would also include ambulance services as well. For the purposes of this report, the City of Mississauga has 27 facilities/locations that fall under this category. They include:

- Fire Station 101 (HQ)
- Fire Station 102 (Lakeview)
- Fire Station 103 (Clarkson)
- Fire Station 104 (Port Credit)
- Fire Station 105 (Malton)
- Fire Station 106 (Dixie)
- Fire Station 106 (Winding Trail)
- Fire Station 107 (Erindale)
- Fire Station 108 (Streetsville)
- Fire Station 109 (Training)
- Fire Station 110 (Queensway)
- Fire Station 111 (Meadowvale)
- Fire Station 112 (Creditview)
- Fire Station 114 (Heartland)
- Fire Station 115 (Erin Mills)
- Fire Station 116 (Old West Malton)
- Fire Station 116 (West Malton) & Peel Ambulance Reporting Centre
- Fire Station 117 (North Dixie)
- Fire Station 118 (East Credit)
- Fire Station 119 (Airport-Leased)
- Fire Station 121 (Meadowvale Village)
- Fire Station 122 (Churchill Meadows)
- Garry W Morden Centre
- Garry W Morden Training Centre - Burn Building
- Garry W Morden Training Centre - Field Shelter
- Garry W Morden Training Centre - Smoke Tower
- Fire Station 119

The above listed locations have a total floor area of approximately 28,500 square meters. This would account for 6.1% of the total building area for City of Mississauga facilities included in this Plan.

7.2 BASELINE

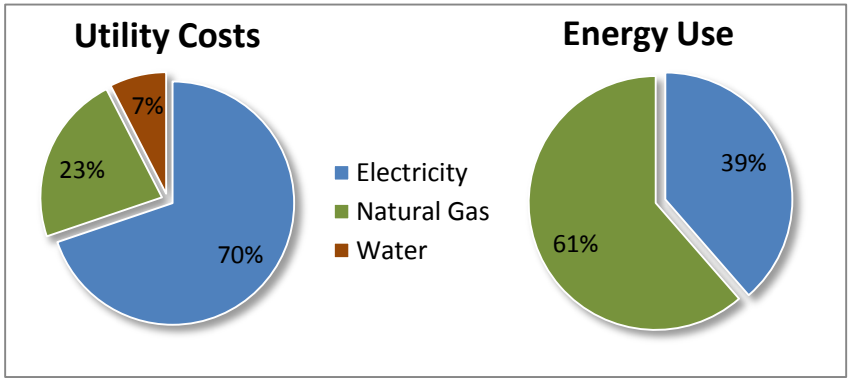
7.2.1 ENERGY USE

The energy use (combined electricity and natural gas) for **Fire Stations and Emergency Services** was 8,345,000 equivalent kilowatt hours in 2018. Following are the key takeaways for the energy usage in 2018:

- 39% of the total energy usage was due to electricity use, which has remained consistent since 2013
- 61% of the total energy usage was due to natural gas use, which has dropped by 3.9% since 2013
- A total of $624,000 in utility costs was incurred, out of which 70% is attributed to electricity, 23% to natural gas, and 7% to water

Fire Stations and Emergency Services accounted for 3.5% of the City's total utility budget for 2018.

Figure 7-1: Utility Costs and Energy Use Breakdown for Fire Stations and Emergency Services



7.2.2 ENERGY USE INTENSITY

Energy Use Intensity (EUI) is a measurement that expresses a building's energy use as a function of its size or other characteristic. It is used to give a better picture of the energy efficiency of a facility. The lower the EUI, the more efficient the facility is.

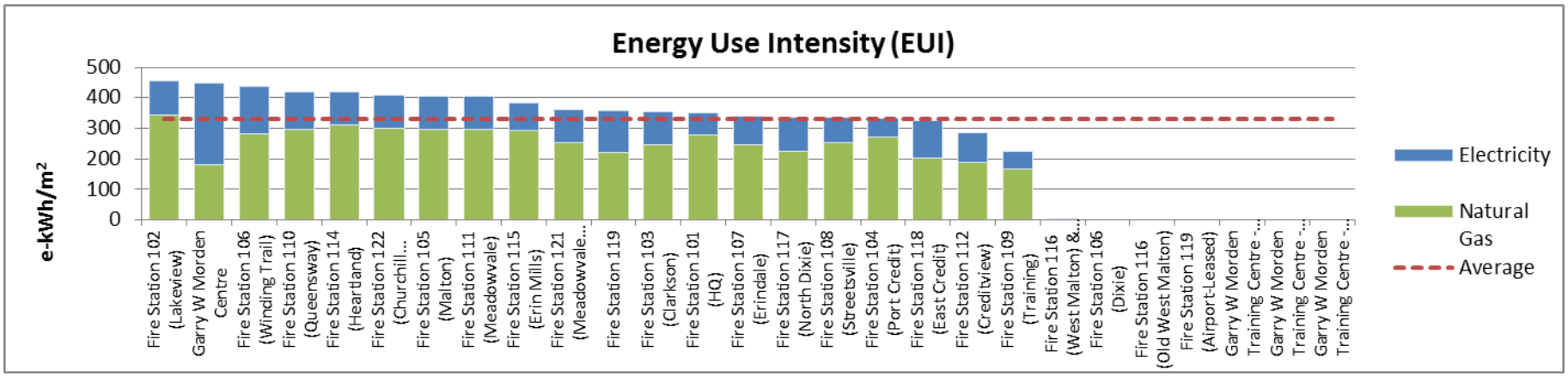
When reviewing EUI, the facility operation type and hours should be taken into account. For example, a facility that operates 24 hours a day will most likely have a higher EUI than a similar one that operates 8 hours a day. Similarly, a facility that has high energy using systems that do not contribute to the building area, such as an outdoor pool or outdoor ice rink, will have a higher EUI than a facility where those systems are located within the facility, as they would add to the facility's area footprint.

For **Fire Stations and Emergency Services** the average EUI in 2018 was 329.0 e-kWh/m2.

The following chart shows the EUI for each facility within **Fire Stations and Emergency Services**, and compares it to the average for the group.

Note: The Average EUI value is calculated by taking the total energy use of all facilities, and dividing by the total area of the facilities. As such, a larger facility would have a bigger impact on the average than a smaller facility.

Figure 7-2: Energy Use Intensity for Fire Stations and Emergency Services

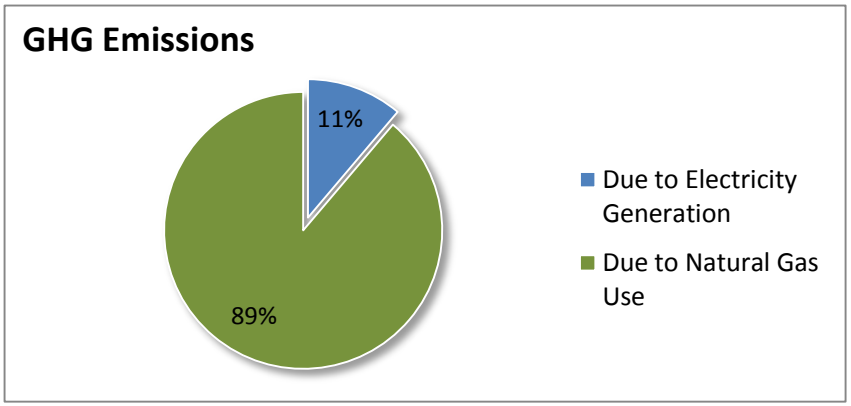


7.2.3 GREENHOUSE GAS (GHG) EMISSIONS

For 2018, **Fire Stations and Emergency Services** emitted 1,038,800 kg (or 1,039 tonnes) of CO2 in 2018. 11.2% of these emissions were due to the generation of electricity, while the use of natural gas accounted for the remaining 88.8%.

Fire Stations and Emergency Services accounted for 5.2% of the City's total GHG emissions for facilities included in the plan.

Figure 7-3: GHG Emissions Breakdown for Fire Stations and Emergency Services

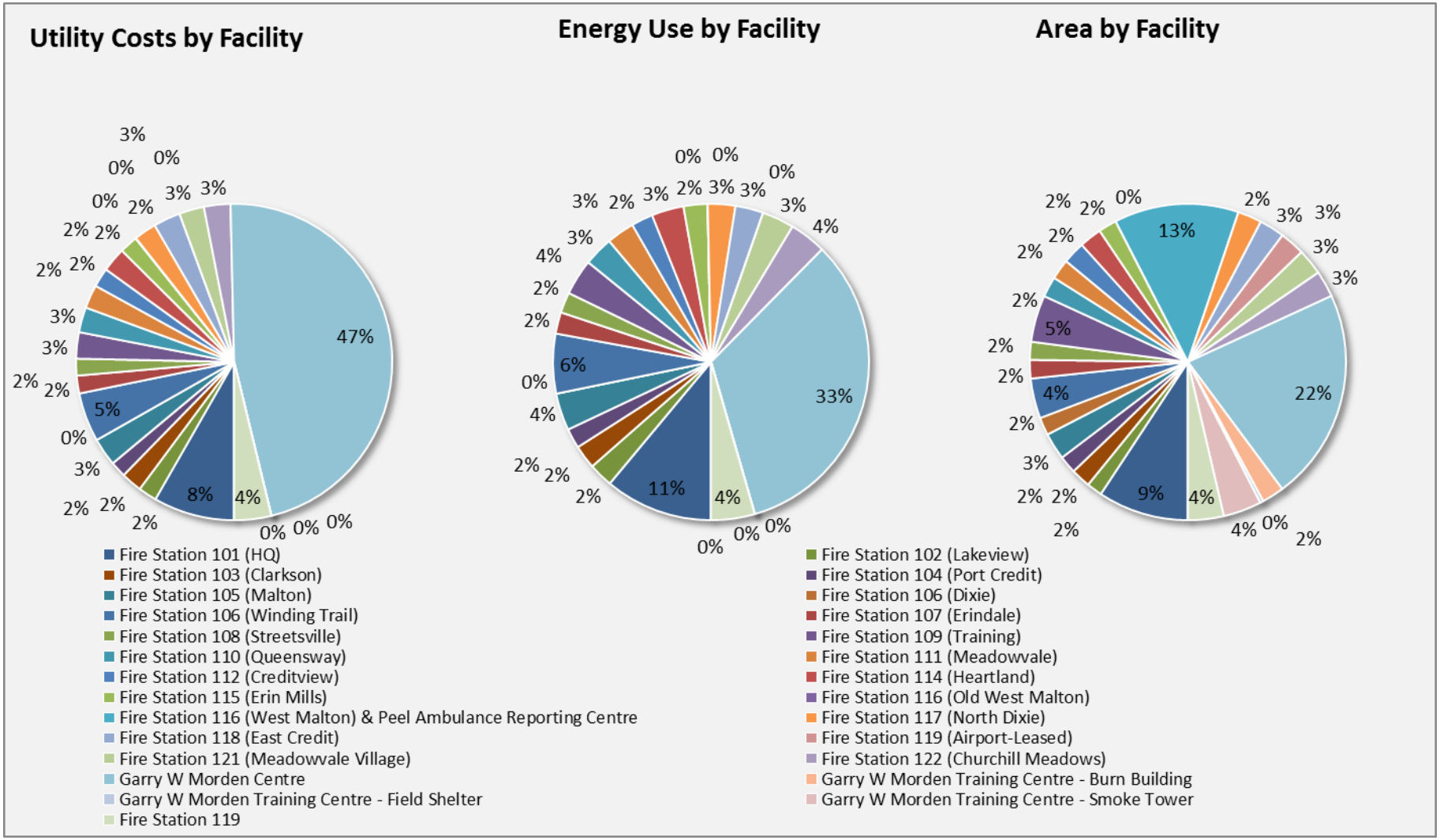


7.3 ENERGY AND GHG BREAKDOWN FOR FIRE STATIONS AND EMERGENCY SERVICES

This section provides a brief overview/recap of the Utility and GHG data for **Fire Stations and Emergency Services**. The table below summarizes, by facility, the utility usage and GHG emissions for 2018. Following are the key takeaways:

- Gary W. Morden Centre is the largest facility by area in the group and contributes towards 33% and 47% of the energy consumption and utility costs respectively in the group
- Fire Station 101 (HQ) is the second largest facility and contributes towards 11% and 8% of the energy consumption and utility costs respectively in the group
- All remaining fire stations are approximately similar in area and contribute equally to the energy consumption and utility costs in the group

Figure 7-4: Utility Costs and Energy Use Breakdown by Facility



2018 Annual Report for Fire Stations and Emergency Services – Part 1 of 2

Facility	Area	Electricity		Natural Gas		Total Energy	Water		Total Costs	GHG Emissions
	m^2	kWh	$	m^3	$	e-kWh	m^3	$	$	kg
Fire Station 101 (HQ)	2,646	186,981	$29,667	70,176	$18,255	**923,830**	1,593	$3,878	**$51,800**	139,434
Fire Station 102 (Lakeview)	452	50,708	$6,065	14,803	$4,783	**206,135**	389	$941	**$11,788**	29,817
Fire Station 103 (Clarkson)	568	61,142	$7,193	13,346	$4,338	**201,274**	737	$1,776	**$13,307**	27,438
Fire Station 104 (Port Credit)	513	30,399	$3,802	13,266	$4,404	**169,693**	745	$1,896	**$10,102**	26,181
Fire Station 105 (Malton)	782	86,274	$9,908	21,996	$6,601	**317,236**	545	$1,323	**$17,833**	44,701
Fire Station 106 (Dixie)	518	0	$0	0	$0	**0**	0	$0	**$0**	0
Fire Station 106 (Winding Trail)	1,164	181,949	$20,195	31,186	$8,795	**509,399**	1,026	$2,317	**$31,307**	65,522
Fire Station 107 (Erindale)	537	51,997	$6,187	12,477	$4,212	**183,000**	374	$909	**$11,308**	25,465
Fire Station 108 (Streetsville)	524	42,525	$5,145	12,642	$4,247	**175,269**	542	$1,320	**$10,712**	25,437
Fire Station 109 (Training)	1,362	79,947	$9,664	21,533	$6,412	**306,048**	313	$760	**$16,836**	43,598
Fire Station 110 (Queensway)	596	74,213	$8,621	16,810	$5,306	**250,720**	842	$2,045	**$15,971**	34,460
Fire Station 111 (Meadowvale)	588	63,121	$7,380	16,636	$5,248	**237,794**	961	$2,338	**$14,967**	33,730
Fire Station 112 (Creditview)	649	62,685	$7,365	11,608	$3,975	**184,564**	355	$862	**$12,202**	24,206
Fire Station 114 (Heartland)	653	70,728	$8,233	19,405	$5,939	**274,482**	550	$1,328	**$15,500**	39,241
Fire Station 115 (Erin Mills)	534	47,971	$5,760	14,932	$4,816	**204,756**	423	$1,025	**$11,601**	29,963

2018 Annual Report for Fire Stations and Emergency Services – Part 2 of 2

Facility	Area	Electricity		Natural Gas		Total Energy	Water		Total Costs	GHG Emissions
	m^2	kWh	$	m^3	$	e-kWh	m^3	$	$	kg
Fire Station 116 (West Malton) & Peel Ambulance Reporting Centre	3,627	168	$282	0	$0	**168**	0	$0	**$282**	6
Fire Station 117 (North Dixie)	697	79,376	$9,020	14,850	$3,999	**235,297**	509	$1,235	**$14,255**	30,938
Fire Station 118 (East Credit)	733	90,073	$10,277	14,231	$4,630	**239,493**	962	$2,321	**$17,227**	30,152
Fire Station 119 (Airport-Leased)	729	0	$0	0	$0	**0**	0	$0	**$0**	0
Fire Station 121 (Meadowvale Village)	760	81,113	$9,275	18,340	$5,719	**273,679**	380	$921	**$15,915**	37,600
Fire Station 122 (Churchill Meadows)	769	84,015	$9,577	21,869	$6,578	**313,640**	323	$783	**$16,939**	44,379
Garry W Morden Centre	6,174	1,651,085	$245,981	106,154	$26,546	**2,765,699**	7,424	$18,109	**$290,636**	260,176
Fire Station 119	1,040	144,072	$16,102	21,778	$6,472	**372,735**	446	$1,084	**$23,659**	46,368
Totals	28,473	3,220,540	$435,700	488,035	$141,274	**8,344,910**	19,436	$47,170	**$624,144**	1,038,814
Usage / Costs per m^2:		127.0	$17.2	22.4	$6.5	**329**	0.9	$2.2	**$24.6**	40.9

7.4 ACTION PLAN

An action plan has been identified with the goal to save on electricity, natural gas, oil, and/or other form of energy consumption within a facility or location.

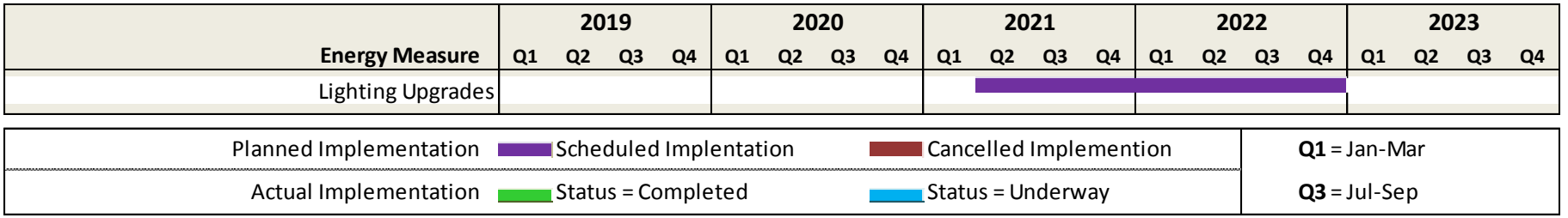
The following figure shows the various projects and initiatives that have been planned for **Fire Stations and Emergency Services**. The chart shows what projects have been planned, when they are planned to be implemented, and the progress of implementation (if applicable). A brief description of each project has been noted below:

- **Lighting Upgrades**: Includes replacement of existing lighting technologies to newer technologies like LEDs, and better controls through localized sensors and BAS scheduling

For the chart below, the **Purple** coloured bars represent the original planned start and completion of a Measure type. The **Green** bar beneath shows the actual start and completion times for a completed measure, while the **Blue** bar shows the actual start time of a Measure that is currently being implemented, but not yet complete. Some Notes:

- A Single Measure timeline may include more than one implementation of that measure (example: In different facilities).
- Due to changing circumstances (change in operations, budget changes, new technology, etc.), a planned measure may be cancelled. These would be indicated by a **Red** plan bar on the chart.

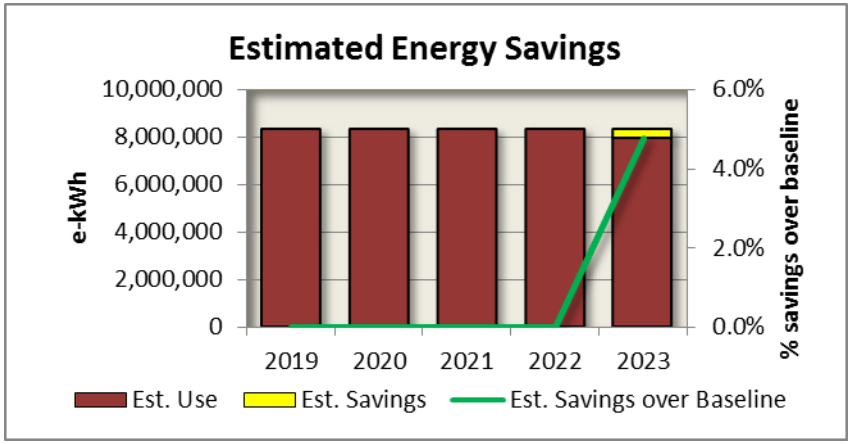
Figure 7-5: Energy Measure Implementation Plan for Fire Stations and Emergency Services



7.5 ESTIMATED SAVINGS

At the end of the plan, **Fire Stations and Emergency Services** are expected to save 4.8% over the base year of 2018, which amounts to a total of $55,000 from all the projects.

Figure 7-6: Energy Measure Annual Savings for Fire Stations and Emergency Services



7.6 PROGRESS TO TARGETS

The City is targeting a 4.8% reduction in energy use in **Fire Stations and Emergency Services** by 2023 over the base year, 2018. The reporting of energy consumption data and savings for **Fire Stations and Emergency Services** will be based on utility meters and assembled annually. Since utility meters monitor energy consumption for the entire facility, the measurement boundary will encompass all parts of the facility. To determine the savings and fairly compare year-to-year energy consumption data, it is important to account for independent variables such as weather and occupancy and apply regression analysis to consumption data. Therefore, actual consumption data for each year starting 2019 will be adjusted to match the weather and occupancy of 2018. The figures below show the updated progress for each year against the set target.

Figure 7-7: Annual Energy Use vs Targeted Energy Use for Fire Stations and Emergency Services

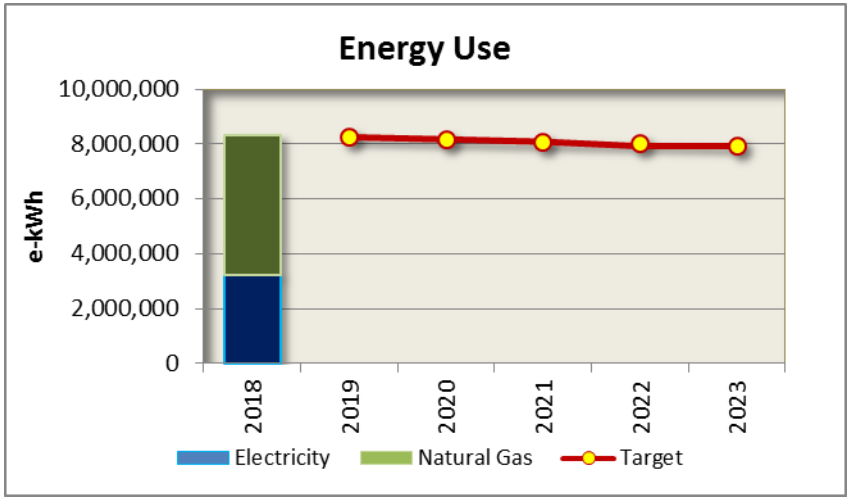
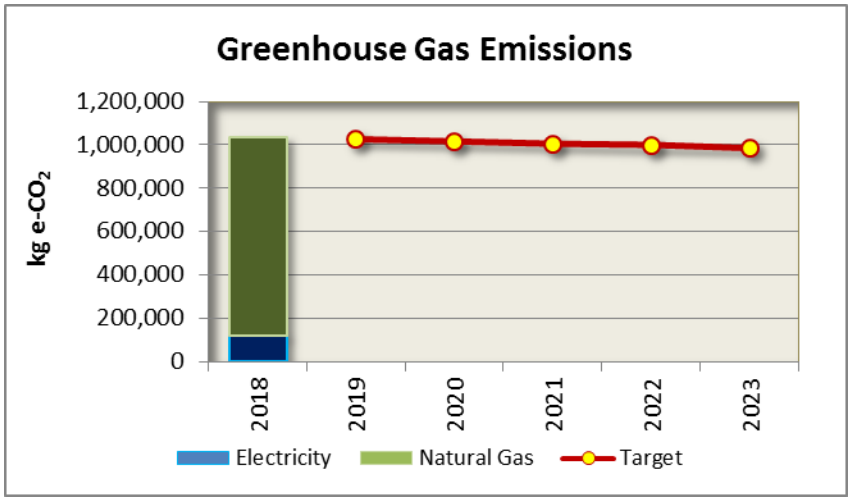


Figure 7-8: Annual GHG Emissions vs Targets for Fire Stations and Emergency Services



7.7 FACILITY INFORMATION FOR FIRE STATIONS AND EMERGENCY SERVICES

Facility: Fire Station 101 (HQ)

Address	15 Fairview Rd W, L5B 1K7		
Area (m^2):	2,646	Area (ft^2):	28,481
Year Built:	1974	Hours per Week :	168
Facility Group:	Fire Station		
Building Components:	Dormitories/Sleeping Quarters; Maintenance Bay; Offices and Meeting Rooms; Truck Bay		

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	231,272	177,958	186,981
Electricity ($)	$38,182	$29,858	$29,667
Natural Gas (m^3)	62,421	61,011	70,176
Natural Gas ($)	$16,309	$16,728	$18,255
Water (m^3)	1,275	1,426	1,593
Water ($)	$2,756	$3,264	$3,878
Total Costs ($)	$57,248	$49,850	$51,800
Total e-kWh	886,697	818,577	923,830
Total e-kWh/m^2	335.1	309.4	349.1
GHG (kg/Yr)	126,365	121,779	139,434
GHG (kg/Yr/m^2)	*48*	*46*	*53*

Energy Measures

Lighting Upgrades

Facility: Fire Station 102 (Lakeview)

Address: 710 Third St, L5E 1B9

Area (m^2): 452 Area (ft^2): 4,865

Year Built: 1979 Hours per Week : 168

Facility Group: Fire Station

Building Components: Dormitories/Sleeping Quarters; Offices and Meeting Rooms; Truck Bay

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	43,258	48,427	50,708
Electricity ($)	$8,792	$6,986	$6,065
Natural Gas (m^3)	14,633	15,145	14,803
Natural Gas ($)	$4,685	$5,055	$4,783
Water (m^3)	511	372	389
Water ($)	$1,097	$851	$941
Total Costs ($)	$14,574	$12,892	$11,788
Total e-kWh	196,899	207,454	206,135
Total e-kWh/m^2	435.6	459.0	456.1
GHG (kg/Yr)	29,227	30,383	29,817
GHG (kg/Yr/m^2)	*65*	*67*	*66*

Energy Measures

Facility: Fire Station 103 (Clarkson)

Address: 2035 Lushes Ave, L5J 1H3

Area (m^2): 568 Area (ft^2): 6,114

Year Built: 1985 Hours per Week : 168

Facility Group: Fire Station

Building Components: Dormitories/Sleeping Quarters; Offices and Meeting Rooms; Truck Bay

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	57,462	57,765	61,142
Electricity ($)	$9,735	$8,430	$7,193
Natural Gas (m^3)	15,014	16,260	13,346
Natural Gas ($)	$4,754	$5,240	$4,338
Water (m^3)	742	1,000	737
Water ($)	$1,609	$2,288	$1,776
Total Costs ($)	$16,098	$15,957	$13,307
Total e-kWh	215,108	228,492	201,274
Total e-kWh/m^2	378.7	402.3	354.4
GHG (kg/Yr)	30,460	32,827	27,438
GHG (kg/Yr/m^2)	*54*	*58*	*48*

Energy Measures

Lighting Upgrades

Facility: Fire Station 104 (Port Credit)

Address: 62 Port St W, L5H 1E3

Area (m^2): 513 Area (ft^2): 8,826

Year Built: 1950 Hours per Week : 168

Facility Group: Fire Station

Building Components: Dormitories/Sleeping Quarters; Offices and Meeting Rooms; Truck Bay

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	27,430	27,306	30,399
Electricity ($)	$4,966	$4,109	$3,802
Natural Gas (m^3)	12,207	13,465	13,266
Natural Gas ($)	$4,035	$4,552	$4,404
Water (m^3)	119	1,105	745
Water ($)	$311	$2,498	$1,896
Total Costs ($)	$9,312	$11,158	$10,102
Total e-kWh	155,598	168,689	169,693
Total e-kWh/m^2	303.3	328.8	330.8
GHG (kg/Yr)	24,070	26,445	26,181
GHG (kg/Yr/m^2)	*47*	*52*	*51*

Energy Measures

Lighting Upgrades

Facility: Fire Station 105 (Malton)

Address: 7101 Goreway Dr, L4T 2T5

Area (m^2): 782 Area (ft^2): 8,417

Year Built: 1980 Hours per Week : 168

Facility Group: Fire Station

Building Components: Dormitories/Sleeping Quarters; Offices and Meeting Rooms; Truck Bay

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	91,319	82,170	86,274
Electricity ($)	$14,686	$11,468	$9,908
Natural Gas (m^3)	20,174	19,136	21,996
Natural Gas ($)	$6,275	$6,281	$6,601
Water (m^3)	630	541	545
Water ($)	$1,366	$1,235	$1,323
Total Costs ($)	$22,327	$18,984	$17,833
Total e-kWh	303,143	283,094	317,236
Total e-kWh/m^2	387.7	362.0	405.7
GHG (kg/Yr)	41,436	39,144	44,701
GHG (kg/Yr/m^2)	*53*	*50*	*57*

Energy Measures

Lighting Upgrades

Facility: Fire Station 106 (Dixie)

Address: 3450 Dixie Rd, L4Y 2B2

Area (m^2): 518 Area (ft^2): 5,576

Year Built: 1979 Hours per Week : 168

Facility Group: Fire Station

Building Components: Dormitories/Sleeping Quarters; Offices and Meeting Rooms; Truck Bay

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	0	0	0
Electricity ($)	$0	$0	$0
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$0	$0	$0
Total e-kWh	0	0	0
Total e-kWh/m^2	0.0	0.0	0.0
GHG (kg/Yr)	0	0	0
GHG (kg/Yr/m^2)	*0*	*0*	*0*

Energy Measures

Facility: Fire Station 106 (Winding Trail)

Address	1355 Winding Trail, L4Y 2V1		
Area (m^2):	1,164	Area (ft^2):	0
Year Built:	1979	Hours per Week :	168
Facility Group:	Fire Station		
Building Components:	Dormitories/Sleeping Quarters; Offices and Meeting Rooms; Truck Bay		

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	156,987	171,995	181,949
Electricity ($)	$25,676	$23,546	$20,195
Natural Gas (m^3)	27,303	30,048	31,186
Natural Gas ($)	$7,516	$8,743	$8,795
Water (m^3)	869	784	1,026
Water ($)	$1,888	$1,432	$2,317
Total Costs ($)	$35,081	$33,721	$31,307
Total e-kWh	443,666	487,501	509,399
Total e-kWh/m^2	381.2	418.8	437.6
GHG (kg/Yr)	57,281	63,013	65,522
GHG (kg/Yr/m^2)	*49*	*54*	*56*

Energy Measures

Facility: Fire Station 107 (Erindale)

Address: 1965 Dundas St W, L5K 1R2

Area (m^2): 537 Area (ft^2): 8,094

Year Built: 1970 Hours per Week : 168

Facility Group: Fire Station

Building Components: Dormitories/Sleeping Quarters; Offices and Meeting Rooms; Truck Bay

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	51,094	52,669	51,997
Electricity ($)	$8,443	$7,330	$6,187
Natural Gas (m^3)	12,230	11,722	12,477
Natural Gas ($)	$4,075	$4,074	$4,212
Water (m^3)	382	343	374
Water ($)	$827	$784	$909
Total Costs ($)	$13,345	$12,188	$11,308
Total e-kWh	179,514	175,747	183,000
Total e-kWh/m^2	334.3	327.3	340.8
GHG (kg/Yr)	24,967	24,062	25,465
GHG (kg/Yr/m^2)	*46*	*45*	*47*

Energy Measures

Lighting Upgrades

Facility: Fire Station 108 (Streetsville)

Address: 2267 Britannia Rd W, L5M 2G6

Area (m^2): 524 Area (ft^2): 5,457

Year Built: 1980 Hours per Week : 168

Facility Group: Fire Station

Building Components: Dormitories/Sleeping Quarters; Offices and Meeting Rooms; Truck Bay

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	45,262	41,341	42,525
Electricity ($)	$7,582	$6,067	$5,145
Natural Gas (m^3)	10,915	12,263	12,642
Natural Gas ($)	$3,707	$4,253	$4,247
Water (m^3)	347	366	542
Water ($)	$751	$837	$1,320
Total Costs ($)	$12,039	$11,157	$10,712
Total e-kWh	159,869	170,104	175,269
Total e-kWh/m^2	305.1	324.6	334.5
GHG (kg/Yr)	22,270	24,678	25,437
GHG (kg/Yr/m^2)	*42*	*47*	*49*

Energy Measures

Lighting Upgrades

Facility: Fire Station 109 (Training)

Address: 1735 Britannia Rd E, L4W 2A3

Area (m^2): 1,362 Area (ft^2): 14,660

Year Built: 1976 Hours per Week : 168

Facility Group: Fire Station

Building Components: Dormitories/Sleeping Quarters; Offices and Meeting Rooms; Truck Bay

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	83,648	80,284	79,947
Electricity ($)	$13,919	$11,870	$9,664
Natural Gas (m^3)	20,176	19,606	21,533
Natural Gas ($)	$5,733	$6,233	$6,412
Water (m^3)	263	367	313
Water ($)	$570	$840	$760
Total Costs ($)	$20,223	$18,943	$16,836
Total e-kWh	295,498	286,149	306,048
Total e-kWh/m^2	217.0	210.1	224.7
GHG (kg/Yr)	41,164	39,966	43,598
GHG (kg/Yr/m^2)	*30*	*29*	*32*

Energy Measures

Facility: Fire Station 110 (Queensway)

Address: 2316 Hurontario Street, L5B 1N1

Area (m^2): 596 Area (ft^2): 6,415

Year Built: 1982 Hours per Week : 168

Facility Group: Fire Station

Building Components: Dormitories/Sleeping Quarters; Offices and Meeting Rooms; Truck Bay

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	72,198	71,991	74,213
Electricity ($)	$12,070	$10,408	$8,621
Natural Gas (m^3)	16,704	16,268	16,810
Natural Gas ($)	$5,082	$5,218	$5,306
Water (m^3)	947	655	842
Water ($)	$2,064	$1,496	$2,045
Total Costs ($)	$19,216	$17,122	$15,971
Total e-kWh	247,589	242,804	250,720
Total e-kWh/m^2	415.4	407.4	420.7
GHG (kg/Yr)	34,186	33,354	34,460
GHG (kg/Yr/m^2)	*57*	*56*	*58*

Energy Measures

Lighting Upgrades

Facility: Fire Station 111 (Meadowvale)

Address: 2740 Derry Rd W, L5N 3N5

Area (m^2): 588 Area (ft^2): 6,329

Year Built: 1983 Hours per Week : 168

Facility Group: Fire Station

Building Components: Dormitories/Sleeping Quarters; Offices and Meeting Rooms; Truck Bay

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	61,094	60,986	63,121
Electricity ($)	$10,399	$8,838	$7,380
Natural Gas (m^3)	14,015	15,527	16,636
Natural Gas ($)	$4,515	$5,173	$5,248
Water (m^3)	746	954	961
Water ($)	$1,916	$2,178	$2,338
Total Costs ($)	$16,831	$16,189	$14,967
Total e-kWh	208,252	224,024	237,794
Total e-kWh/m^2	354.2	381.0	404.4
GHG (kg/Yr)	28,702	31,558	33,730
GHG (kg/Yr/m^2)	*49*	*54*	*57*

Energy Measures

Lighting Upgrades

Facility: Fire Station 112 (Creditview)

Address: 4090 Creditview Rd, L5C 4E3

Area (m^2): 649 Area (ft^2): 6,986

Year Built: 1984 Hours per Week : 168

Facility Group: Fire Station

Building Components: Dormitories/Sleeping Quarters; Offices and Meeting Rooms; Truck Bay

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	50,067	61,123	62,685
Electricity ($)	$8,582	$8,789	$7,365
Natural Gas (m^3)	11,147	10,681	11,608
Natural Gas ($)	$3,785	$3,859	$3,975
Water (m^3)	662	322	355
Water ($)	$1,440	$734	$862
Total Costs ($)	$13,806	$13,382	$12,202
Total e-kWh	167,109	173,269	184,564
Total e-kWh/m^2	257.5	267.0	284.4
GHG (kg/Yr)	22,881	22,397	24,206
GHG (kg/Yr/m^2)	*35*	*35*	*37*

Energy Measures

Lighting Upgrades

Facility: Fire Station 114 (Heartland)

Address	5845 Falbourne St., L5R 3L8		
Area (m^2):	653	Area (ft^2):	7,029
Year Built:	1989	Hours per Week :	168
Facility Group:	Fire Station		
Building Components:	Dormitories/Sleeping Quarters; Offices and Meeting Rooms; Truck Bay		

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	67,090	68,495	70,728
Electricity ($)	$11,304	$9,709	$8,233
Natural Gas (m^3)	17,079	19,259	19,405
Natural Gas ($)	$5,278	$6,164	$5,939
Water (m^3)	688	631	550
Water ($)	$1,475	$1,444	$1,328
Total Costs ($)	$18,057	$17,316	$15,500
Total e-kWh	246,418	270,718	274,482
Total e-kWh/m^2	377.4	414.6	420.3
GHG (kg/Yr)	34,711	38,885	39,241
GHG (kg/Yr/m^2)	*53*	*60*	*60*

Energy Measures

Lighting Upgrades

Facility: Fire Station 115 (Erin Mills)

Address: 4595 Glen Erin Dr., L5M 4E8

Area (m^2): 534 Area (ft^2): 5,748

Year Built: 1990 Hours per Week : 168

Facility Group: Fire Station

Building Components: Dormitories/Sleeping Quarters; Offices and Meeting Rooms; Truck Bay

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	46,794	44,510	47,971
Electricity ($)	$8,068	$6,582	$5,760
Natural Gas (m^3)	15,730	16,165	14,932
Natural Gas ($)	$4,794	$5,146	$4,816
Water (m^3)	433	460	423
Water ($)	$937	$1,051	$1,025
Total Costs ($)	$13,799	$12,779	$11,601
Total e-kWh	211,956	214,242	204,756
Total e-kWh/m^2	396.9	401.2	383.4
GHG (kg/Yr)	31,429	32,170	29,963
GHG (kg/Yr/m^2)	*59*	*60*	*56*

Energy Measures

Lighting Upgrades

Facility: Fire Station 116 (West Malton) & Peel Ambulance Reporting Centre

Address	6825 Tomken Rd, L5T 1N4		
Area (m^2):	3,627	Area (ft^2):	39,041
Year Built:	2011	Hours per Week :	168
Facility Group:	Fire Station		
Building Components:	Dormitories/Sleeping Quarters; Offices and Meeting Rooms; Truck Bay; Ambulance Services		

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	0	0	168
Electricity ($)	$0	$0	$282
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$0	$0	$282
Total e-kWh	0	0	168
Total e-kWh/m^2	0.0	0.0	0.0
GHG (kg/Yr)	0	0	6
GHG (kg/Yr/m^2)	*0*	*0*	*0*

Energy Measures

Facility: Fire Station 117 (North Dixie)

Address: 1090 Nuvik Crt, L4W 5E6

Area (m^2): 697 Area (ft^2): 7,502

Year Built: 1999 Hours per Week : 168

Facility Group: Fire Station

Building Components: Dormitories/Sleeping Quarters; Offices and Meeting Rooms; Truck Bay

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	76,280	73,630	79,376
Electricity ($)	$12,151	$10,215	$9,020
Natural Gas (m^3)	12,451	14,824	14,850
Natural Gas ($)	$3,917	$4,849	$3,999
Water (m^3)	642	498	509
Water ($)	$1,382	$1,136	$1,235
Total Costs ($)	$17,450	$16,201	$14,255
Total e-kWh	207,011	229,282	235,297
Total e-kWh/m^2	297.0	329.0	337.6
GHG (kg/Yr)	26,290	30,683	30,938
GHG (kg/Yr/m^2)	*38*	*44*	*44*

Energy Measures

Lighting Upgrades

Facility: Fire Station 118 (East Credit)

Address	1045 Bristol Rd W, L5V 2J8		
Area (m^2):	733	Area (ft^2):	7,890
Year Built:	1996	Hours per Week :	168
Facility Group:	Fire Station		
Building Components:	Dormitories/Sleeping Quarters; Offices and Meeting Rooms; Truck Bay		

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	74,237	71,790	90,073
Electricity ($)	$12,062	$10,076	$10,277
Natural Gas (m^3)	12,834	13,907	14,231
Natural Gas ($)	$4,098	$4,702	$4,630
Water (m^3)	1,342	1,537	962
Water ($)	$2,952	$3,518	$2,321
Total Costs ($)	$19,112	$18,295	$17,227
Total e-kWh	208,990	217,813	239,493
Total e-kWh/m^2	285.1	297.2	326.7
GHG (kg/Yr)	26,941	28,882	30,152
GHG (kg/Yr/m^2)	*37*	*39*	*41*

Energy Measures

Lighting Upgrades

Facility: Fire Station 119 (Airport-Leased)

Address	3201 Elmbank Road, L4V 1A6		
Area (m^2):	729	Area (ft^2):	7,847
Year Built:	2000	Hours per Week :	168
Facility Group:	Fire Station		
Building Components:	Dormitories/Sleeping Quarters; Offices and Meeting Rooms; Truck Bay		

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	8,675	0	0
Electricity ($)	$1,546	$0	$0
Natural Gas (m^3)	14,018	0	0
Natural Gas ($)	-$337	$0	$0
Water (m^3)	71	0	0
Water ($)	$144	$0	$0
Total Costs ($)	$1,353	$0	$0
Total e-kWh	155,864	0	0
Total e-kWh/m^2	213.8	0.0	0.0
GHG (kg/Yr)	26,820	0	0
GHG (kg/Yr/m^2)	*37*	*0*	*0*

Energy Measures

Facility: Fire Station 121 (Meadowvale Village)

Address: 6745 Mavis Road, L5W 1L9

Area (m^2): 760 Area (ft^2): 8,181

Year Built: 2002 Hours per Week : 168

Facility Group: Fire Station

Building Components: Dormitories/Sleeping Quarters; Offices and Meeting Rooms; Truck Bay

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	79,199	80,334	81,113
Electricity ($)	$12,711	$11,197	$9,275
Natural Gas (m^3)	14,367	16,679	18,340
Natural Gas ($)	$4,505	$5,487	$5,719
Water (m^3)	339	381	380
Water ($)	$734	$869	$921
Total Costs ($)	$17,949	$17,553	$15,915
Total e-kWh	230,054	255,467	273,679
Total e-kWh/m^2	302.7	336.1	360.1
GHG (kg/Yr)	30,019	34,433	37,600
GHG (kg/Yr/m^2)	*39*	*45*	*49*

Energy Measures

Lighting Upgrades

Facility: Fire Station 122 (Churchill Meadows)

Address	3600 Thomas St, L5M 7E2		
Area (m^2):	769	Area (ft^2):	8,277
Year Built:	2003	Hours per Week :	168
Facility Group:	Fire Station		
Building Components:	Dormitories/Sleeping Quarters; Offices and Meeting Rooms; Truck Bay		

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	75,955	77,975	84,015
Electricity ($)	$12,600	$11,039	$9,577
Natural Gas (m^3)	18,790	16,725	21,869
Natural Gas ($)	$5,762	$5,198	$6,578
Water (m^3)	366	321	323
Water ($)	$791	$744	$783
Total Costs ($)	$19,153	$16,981	$16,939
Total e-kWh	273,249	253,587	313,640
Total e-kWh/m^2	355.3	329.8	407.9
GHG (kg/Yr)	38,266	34,434	44,379
GHG (kg/Yr/m^2)	*50*	*45*	*58*

Energy Measures

Lighting Upgrades

Facility: Garry W Morden Centre

Address: 7535 Ninth Line, L5N 7C3

Area (m^2): 6,174 Area (ft^2): 66,273

Year Built: 2012 Hours per Week : 70

Facility Group: Fire Station

Building Components: Offices and Meeting Rooms; Training Rooms; Truck Bay

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	1,667,820	1,673,764	1,651,085
Electricity ($)	$257,363	$255,646	$245,981
Natural Gas (m^3)	100,928	120,060	106,154
Natural Gas ($)	$25,054	$31,292	$26,546
Water (m^3)	12,359	21,340	7,424
Water ($)	$26,997	$42,350	$18,109
Total Costs ($)	$309,414	$329,287	$290,636
Total e-kWh	2,727,561	2,934,392	2,765,699
Total e-kWh/m^2	441.8	475.3	448.0
GHG (kg/Yr)	250,896	287,289	260,176
GHG (kg/Yr/m^2)	*41*	*47*	*42*

Energy Measures

Facility: Fire Station 119

Address: 6375 Airport Rd, L4V 1E4

Area (m^2): 1,040 Area (ft^2): 11,194

Year Built: Hours per Week :

Facility Group: Fire Station

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	112,451	115,624	144,072
Electricity ($)	$17,521	$15,932	$16,102
Natural Gas (m^3)	20,213	19,729	21,778
Natural Gas ($)	$5,206	$5,826	$6,472
Water (m^3)	404	421	446
Water ($)	$911	$961	$1,084
Total Costs ($)	$23,638	$22,720	$23,659
Total e-kWh	324,687	322,781	372,735
Total e-kWh/m^2	312.2	310.4	358.4
GHG (kg/Yr)	42,271	41,471	46,368
GHG (kg/Yr/m^2)	*41*	*40*	*45*

Energy Measures

8.0 GOLF COURSES AND ASSOCIATED FACILITIES

8.1 SCOPE AND BOUNDARY

Golf Courses and Associated Facilities include facilities that consist primarily of the following operations:

- Clubhouse
- Maintenance Shed
- Golf Course

For the purposes of this report, the City of Mississauga has 7 facilities/locations that fall under this category. They include:

- Brae Ben Gen Stn
- BraeBen Academy
- BraeBen Golf Course
- BraeBen Golf Course Maintenance Shed
- Lakeview Golf Course
- Lakeview Golf Course Open Pond
- Lakeview Greenskeeper

The above listed locations have a total floor area of approximately 4,800 square meters. This would account for 1.0% of the total building area for City of Mississauga facilities included in this Plan.

8.2 BASELINE

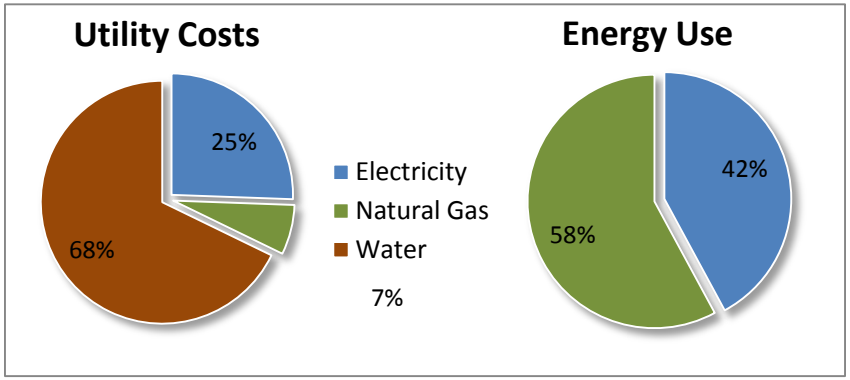
8.2.1 ENERGY USE

The energy use (combined electricity and natural gas) for **Golf Courses and Associated Facilities** was 1,586,000 equivalent kilowatt hours in 2018. Following are the key takeaways for the energy usage in 2018:

- 42% of the total energy usage was due to electricity use, which has dropped by 13.3% since 2013
- 58% of the total energy usage was due to natural gas use, which has increased by 4.5% since 2013
- A total of $424,000 in utility costs was incurred, out of which 25% is attributed to electricity, 7% to natural gas, and 68% to water

Golf Courses and Associated Facilities accounted for 2.4% of the City's total utility budget for 2018.

Figure 8-1: Utility Costs and Energy Use Breakdown for Golf Courses and Associated Facilities



8.2.2 ENERGY USE INTENSITY

Energy Use Intensity (EUI) is a measurement that expresses a building's energy use as a function of its size or other characteristic. It is used to give a better picture of the energy efficiency of a facility. The lower the EUI, the more efficient the facility is.

When reviewing EUI, the facility operation type and hours should be taken into account. For example, a facility that operates 24 hours a day will most likely have a higher EUI than a similar one that operates 8

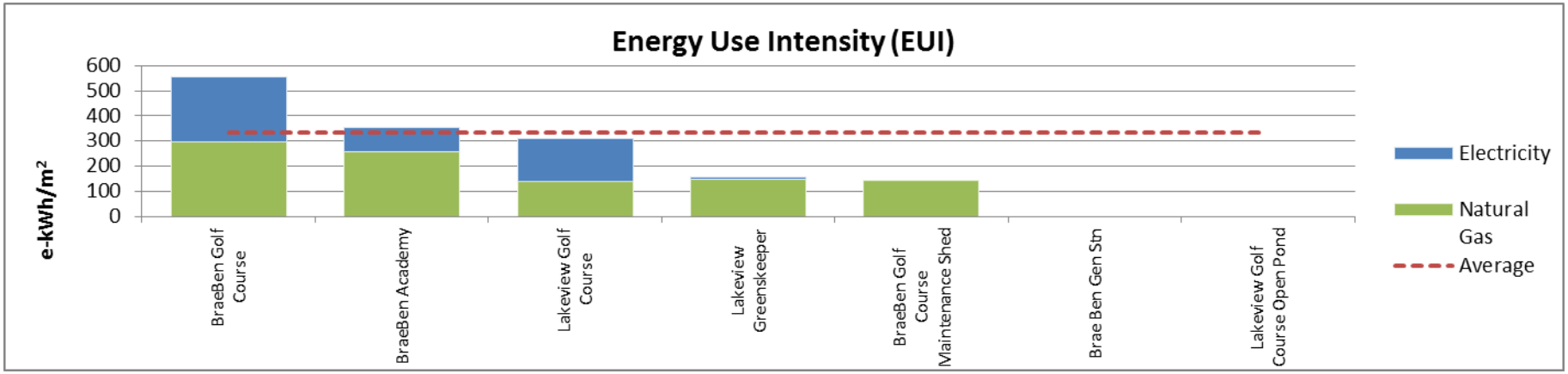
hours a day. Similarly, a facility that has high energy using systems that do not contribute to the building area, such as an outdoor pool or outdoor ice rink, will have a higher EUI than a facility where those systems are located within the facility, as they would add to the facility's area footprint.

For **Golf Courses and Associated Facilities** the average EUI in 2018 was 331.8 e-kWh/m2

The following chart shows the EUI for each facility within **Golf Courses and Associated Facilities**, and compares it to the average for the group.

Note: The Average EUI value is calculated by taking the total energy use of all facilities, and dividing by the total area of the facilities. As such, a larger facility would have a bigger impact on the average than a smaller facility.

Figure 8-2: Energy Use Intensity for Golf Courses and Associated Facilities

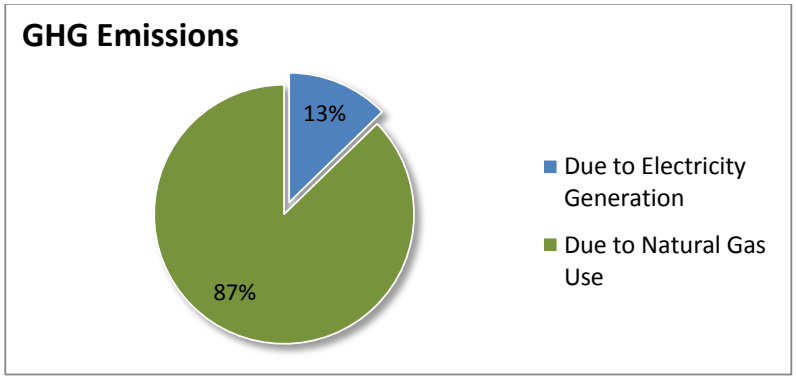


8.2.3 GREENHOUSE GAS (GHG) EMISSIONS

For 2018, **Golf Courses and Associated Facilities** emitted 189,400 kg (or 189 tonnes) of CO2 in 2018. 12.7% of these emissions were due to the generation of electricity, while the use of natural gas accounted for the remaining 87.3%.

Golf Courses and Associated Facilities accounted for 1.0% of the City's total GHG emissions for facilities included in the plan.

Figure 8-3: GHG Emissions Breakdown for Golf Courses and Associated Facilities

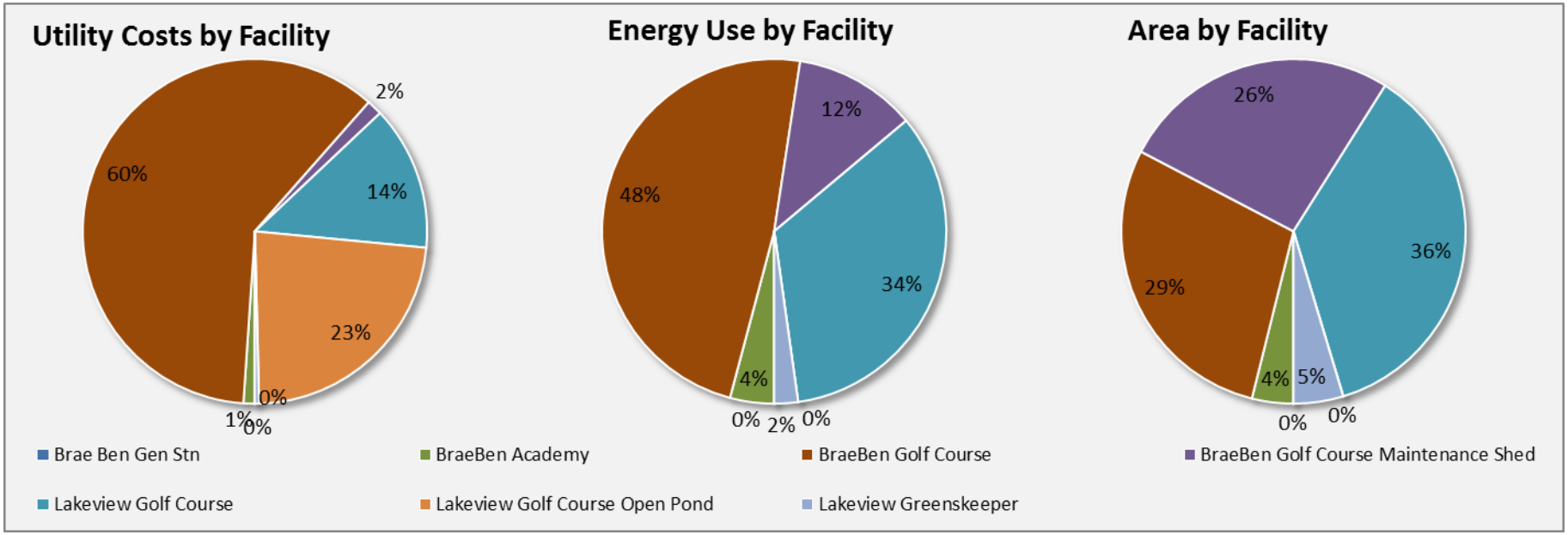


8.3 ENERGY AND GHG BREAKDOWN FOR GOLF COURSES AND ASSOCIATED FACILITIES

This section provides a brief overview/recap of the Utility and GHG data for **Golf Courses and Associated Facilities**. The table below summarizes, by facility, the utility usage and GHG emissions for 2018. Following are the key takeaways:

- The premises at BreaBen Golf Course represent the largest area in the group and contribute towards 64% and 63% of the energy consumption and utility costs respectively in the group
- The premises at Lakeview Golf Course contribute towards 36% and 37% of the energy consumption and utility costs respectively in the group

Figure 8-4: Utility Costs and Energy Use Breakdown by Facility



2018 Annual Report for Golf Courses and Associated Facilities

Facility	Area	Electricity		Natural Gas		Total Energy	Water		Total Costs	GHG Emissions
	m^2	kWh	$	m^3	$	e-kWh	m^3	$	$	kg
Brae Ben Gen Stn	0	0	$0	0	$0	**0**	0	$0	**$0**	0
BraeBen Academy	186	17,428	$2,447	4,596	$2,089	**65,685**	0	$0	**$4,536**	9,318
BraeBen Golf Course	1,375	355,638	$57,169	39,047	$10,895	**765,632**	127,078	$188,069	**$256,133**	86,641
BraeBen Golf Course Maintenance Shed	1,257	0	$0	17,351	$6,146	**182,186**	0	$0	**$6,146**	32,811
Lakeview Golf Course	1,739	292,236	$48,256	23,332	$7,854	**537,220**	929	$1,332	**$57,443**	54,641
Lakeview Golf Course Open Pond	0	0	$0	0	$0	**0**	67,556	$97,857	**$97,857**	0
Lakeview Greenskeeper	223	2,532	$496	3,120	$1,110	**35,296**	12	$29	**$1,634**	5,992
Totals	4,780	667,834	$108,368	87,446	$28,094	**1,586,018**	195,575	$287,287	**$423,749**	189,403
Usage / Costs per m^2:		189.6	$30.8	18.3	$5.9	**332**	38.4	$56.8	**$68.2**	39.6

8.4 ACTION PLAN

An action plan has been identified with the goal to save on electricity, natural gas, oil, and/or other form of energy consumption within a facility or location.

The following figure shows the various projects and initiatives that have been planned for **Golf Courses and Associated Facilities**. The chart shows what projects have been planned, when they are planned to be implemented, and the progress of implementation (if applicable). A brief description of each project has been noted below:

- **Energy Upgrades for Lifecycle Replacements**: Includes energy upgrades for high capital assets that show economic paybacks only at the time of replacement like envelope and HVAC equipment

For the chart below, the **Purple** coloured bars represent the original planned start and completion of a Measure type. The **Green** bar beneath shows the actual start and completion times for a completed measure, while the **Blue** bar shows the actual start time of a Measure that is currently being implemented, but not yet complete. Some Notes:

- A Single Measure timeline may include more than one implementation of that measure (example: In different facilities).
- Due to changing circumstances (change in operations, budget changes, new technology, etc.), a planned measure may be cancelled. These would be indicated by a **Red** plan bar on the chart.

Figure 8-5: Energy Measure Implementation Plan for Golf Courses and Associated Facilities

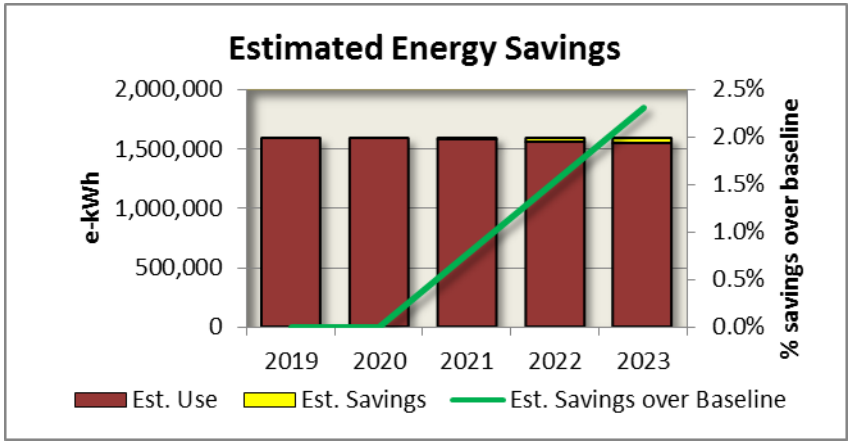
Energy Measure	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1	2022 Q2	2022 Q3	2022 Q4	2023 Q1	2023 Q2	2023 Q3	2023 Q4
Energy Upgrades for Lifecycle Replacements																				

Planned Implementation	Scheduled Implentation	Cancelled Implemention	**Q1** = Jan-Mar
Actual Implementation	Status = Completed	Status = Underway	**Q3** = Jul-Sep

8.5 ESTIMATED SAVINGS

At the end of the plan, **Golf Courses and Associated Facilities** are expected to save 2.3% over the base year of 2018, which amounts to a total of $1,540 from all the projects.

Figure 8-6: Energy Measure Annual Savings for Golf Courses and Associated Facilities



8.6 PROGRESS TO TARGETS

The City is targeting a 2.3% reduction in energy use in **Golf Courses and Associated Facilities** by 2023 over the base year, 2018. The reporting of energy consumption data and savings for **Golf Courses and Associated Facilities** will be based on utility meters and assembled annually. Since utility meters monitor energy consumption for the entire facility, the measurement boundary will encompass all parts of the facility. To determine the savings and fairly compare year-to-year energy consumption data, it is important to account for independent variables such as weather and occupancy and apply regression analysis to consumption data. Therefore, actual consumption data for each year starting 2019 will be adjusted to match the weather and occupancy of 2018. The figures below show the updated progress for each year against the set target.

Figure 8-7: Annual Energy Use vs Targeted Energy Use for Golf Courses and Associated Facilities

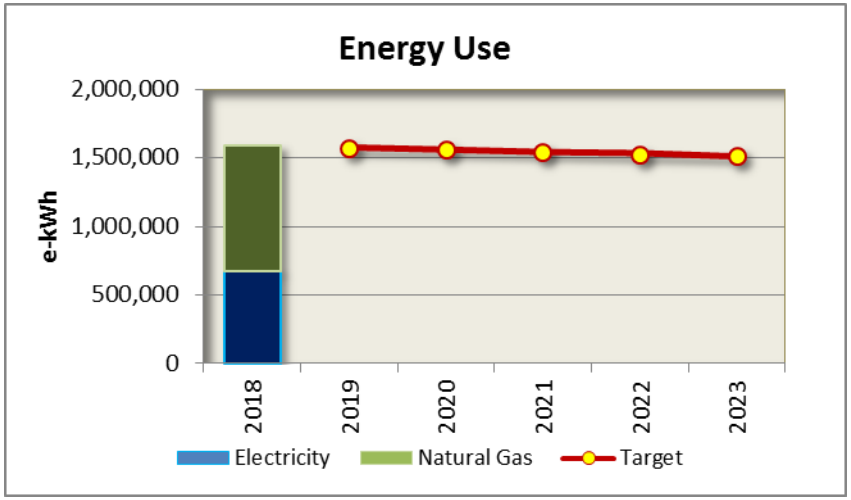
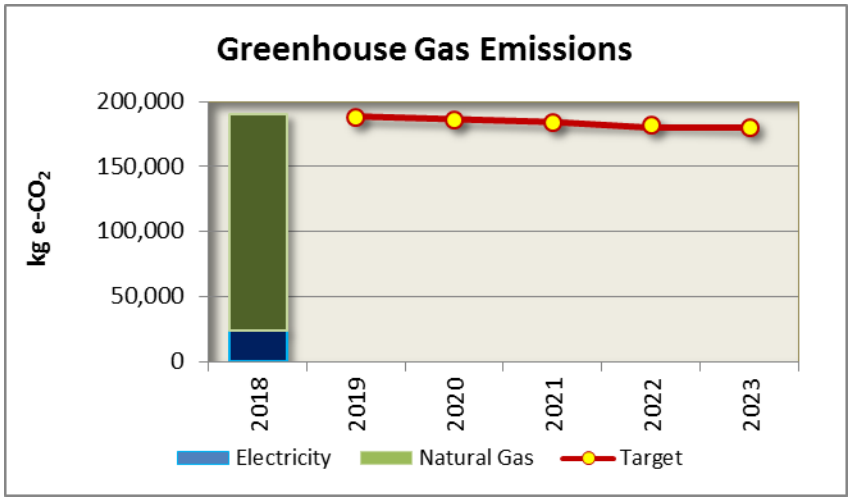


Figure 8-8: Annual GHG Emissions vs Targets for Golf Courses and Associated Facilities



8.7 FACILITY INFORMATION FOR GOLF COURSES AND ASSOCIATED FACILITIES

Facility: BraeBen Academy

Address 5650 Terry Fox Way, L5V 2W2

Area (m^2): 186 Area (ft^2): 0

Year Built: Hours per Week :

Facility Group: Golf

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	19,562	24,171	17,428
Electricity ($)	$3,747	$3,369	$2,447
Natural Gas (m^3)	5,263	5,737	4,596
Natural Gas ($)	$2,231	$2,482	$2,089
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$5,979	$5,851	$4,536
Total e-kWh	74,827	84,405	65,685
Total e-kWh/m^2	402.3	453.8	353.1
GHG (kg/Yr)	10,657	11,718	9,318
GHG (kg/Yr/m^2)	*57*	*63*	*50*

Energy Measures

Facility: BraeBen Golf Course

Address: 5700 Terry Fox Way, RR 6, L5V 2W2

Area (m^2): 1,375 Area (ft^2): 14,800

Year Built: 2005 Hours per Week : 84

Facility Group: Golf

Building Components: Clubhouse; Golf Course

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	392,172	376,207	355,638
Electricity ($)	$65,629	$60,998	$57,169
Natural Gas (m^3)	32,371	29,798	39,047
Natural Gas ($)	$9,406	$9,360	$10,895
Water (m^3)	164,967	100,654	127,078
Water ($)	$240,594	$136,739	$188,069
Total Costs ($)	$315,628	$207,096	$256,133
Total e-kWh	732,072	689,090	765,632
Total e-kWh/m^2	532.4	501.2	556.8
GHG (kg/Yr)	75,333	69,892	86,641
GHG (kg/Yr/m^2)	*55*	*51*	*63*

Energy Measures

Energy Upgrades for Lifecycle Replacements
Controls Upgrades
Lighting Upgrades

Facility: BraeBen Golf Course Maintenance Shed

Address: 5750 Terry Fox Way, L5V 2W2

Area (m^2): 1,257 Area (ft^2): 0

Year Built: Hours per Week :

Facility Group: Golf

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	0	0	0
Electricity ($)	$0	$0	$0
Natural Gas (m^3)	14,760	18,979	17,351
Natural Gas ($)	$4,637	$5,999	$6,146
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$4,637	$5,999	$6,146
Total e-kWh	154,982	199,284	182,186
Total e-kWh/m^2	123.3	158.5	144.9
GHG (kg/Yr)	27,911	35,890	32,811
GHG (kg/Yr/m^2)	*22*	*29*	*26*

Energy Measures

Facility: Lakeview Golf Course

Address: 1190 Dixie Rd, L5E 2P4

Area (m^2): 1,739 Area (ft^2): 18,718

Year Built: 1939 Hours per Week : 84

Facility Group: Golf

Building Components: Clubhouse; Golf Course; Cart Storage/Repair

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	306,631	299,675	292,236
Electricity ($)	$59,843	$53,067	$48,256
Natural Gas (m^3)	33,600	23,777	23,332
Natural Gas ($)	$10,511	$8,774	$7,854
Water (m^3)	1,228	821	929
Water ($)	$2,095	$1,551	$1,332
Total Costs ($)	$72,449	$63,392	$57,443
Total e-kWh	659,430	549,332	537,220
Total e-kWh/m^2	379.2	315.9	308.9
GHG (kg/Yr)	74,576	55,750	54,641
GHG (kg/Yr/m^2)	*43*	*32*	*31*

Energy Measures

Energy Upgrades for Lifecycle Replacements

Facility: Lakeview Golf Course Open Pond

Address 1190 Dixie Rd, L5E 2P4

Area (m^2): Area (ft^2):

Year Built: Hours per Week :

Facility Group: Golf

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	0	0	0
Electricity ($)	$0	$0	$0
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	82,927	47,375	67,556
Water ($)	$104,978	$63,151	$97,857
Total Costs ($)	$104,978	$63,151	$97,857
Total e-kWh	0	0	0
Total e-kWh/m^2	N/A	N/A	N/A
GHG (kg/Yr)	0	0	0
GHG (kg/Yr/m^2)	*N/A*	*N/A*	*N/A*

Energy Measures

Facility: Lakeview Greenskeeper

Address: 1392 Dixie Road, L5E 3E1

Area (m^2): 223 Area (ft^2): 2,400

Year Built: 1939 Hours per Week : 70

Facility Group: Golf

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	3,520	1,452	2,532
Electricity ($)	$780	$415	$496
Natural Gas (m^3)	2,227	721	3,120
Natural Gas ($)	$1,612	$610	$1,110
Water (m^3)	18	7	12
Water ($)	$43	$16	$29
Total Costs ($)	$2,436	$1,040	$1,634
Total e-kWh	26,899	9,023	35,296
Total e-kWh/m^2	120.6	40.5	158.3
GHG (kg/Yr)	4,337	1,416	5,992
GHG (kg/Yr/m^2)	*19*	*6*	*27*

Energy Measures

9.0 HERITAGE BUILDINGS

9.1 SCOPE AND BOUNDARY

For the purposes of this report, the City of Mississauga has 6 facilities/locations that fall under the **Heritage Buildings** category. They include:

- Riverwood - Chappel Estate House
- Riverwood - Chappel Estate Cabin
- Bussell House
- Meadowvale Hall
- Pinchin Property
- Pinchin Property - Leslie Log House

The above listed locations have a total floor area of approximately 1,000 square meters. This would account for 0.2% of the total building area for City of Mississauga facilities included in this Plan.

9.2 BASELINE

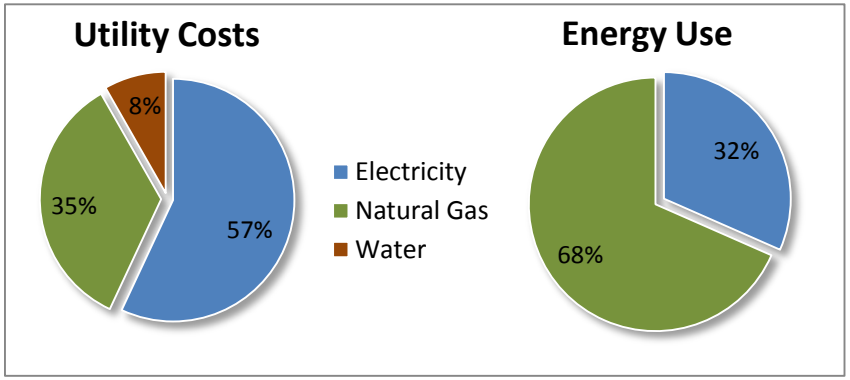
9.2.1 ENERGY USE

The energy use (combined electricity and natural gas) for **Heritage Buildings** was 365,000 equivalent kilowatt hours in 2018. Following are the key takeaways for the energy usage in 2018:

- 32% of the total energy usage was due to electricity use, which has dropped by 15.6% since 2013
- 68% of the total energy usage was due to natural gas use, which has increased by 80.6% since 2013
- A total of $24,000 in utility costs was incurred, out of which 57% is attributed to electricity, 35% to natural gas, and 8% to water

Heritage Buildings accounted for 0.1% of the City's total utility budget for 2018.

Figure 9-1: Utility Costs and Energy Use Breakdown for Heritage Buildings



9.2.2 ENERGY USE INTENSITY

Energy Use Intensity (EUI) is a measurement that expresses a building's energy use as a function of its size or other characteristic. It is used to give a better picture of the energy efficiency of a facility. The lower the EUI, the more efficient the facility is.

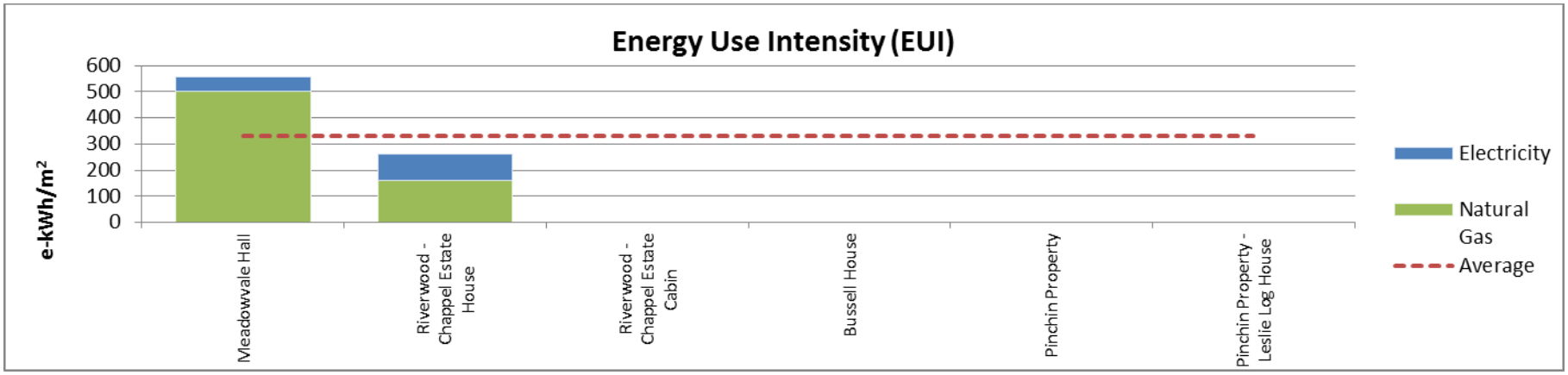
When reviewing EUI, the facility operation type and hours should be taken into account. For example, a facility that operates 24 hours a day will most likely have a higher EUI than a similar one that operates 8 hours a day. Similarly, a facility that has high energy using systems that do not contribute to the building area, such as an outdoor pool or outdoor ice rink, will have a higher EUI than a facility where those systems are located within the facility, as they would add to the facility's area footprint.

For **Heritage Buildings** the average EUI in 2018 was 332.9 e-kWh/m2.

The following chart shows the EUI for each facility within **Heritage Buildings**, and compares it to the average for the group.

Note: The Average EUI value is calculated by taking the total energy use of all facilities, and dividing by the total area of the facilities. As such, a larger facility would have a bigger impact on the average than a smaller facility.

Figure 9-2: Energy Use Intensity for Heritage Buildings

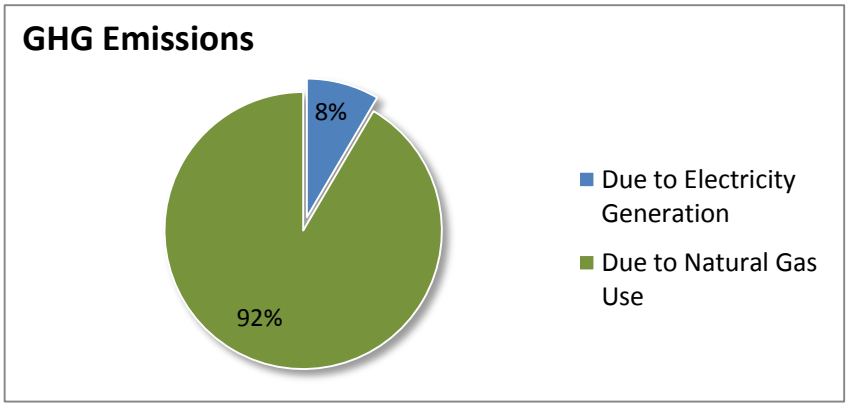


9.2.3 GREENHOUSE GAS (GHG) EMISSIONS

For 2018, **Heritage Buildings** emitted 49,200 kg (or 49 tonnes) of CO2 in 2018. 8.5% of these emissions were due to the generation of electricity, while the use of natural gas accounted for the remaining 91.5%.

Heritage Buildings accounted for 0.2% of the City's total GHG emissions for facilities included in the plan.

Figure 9-3: GHG Emissions Breakdown for Heritage Buildings

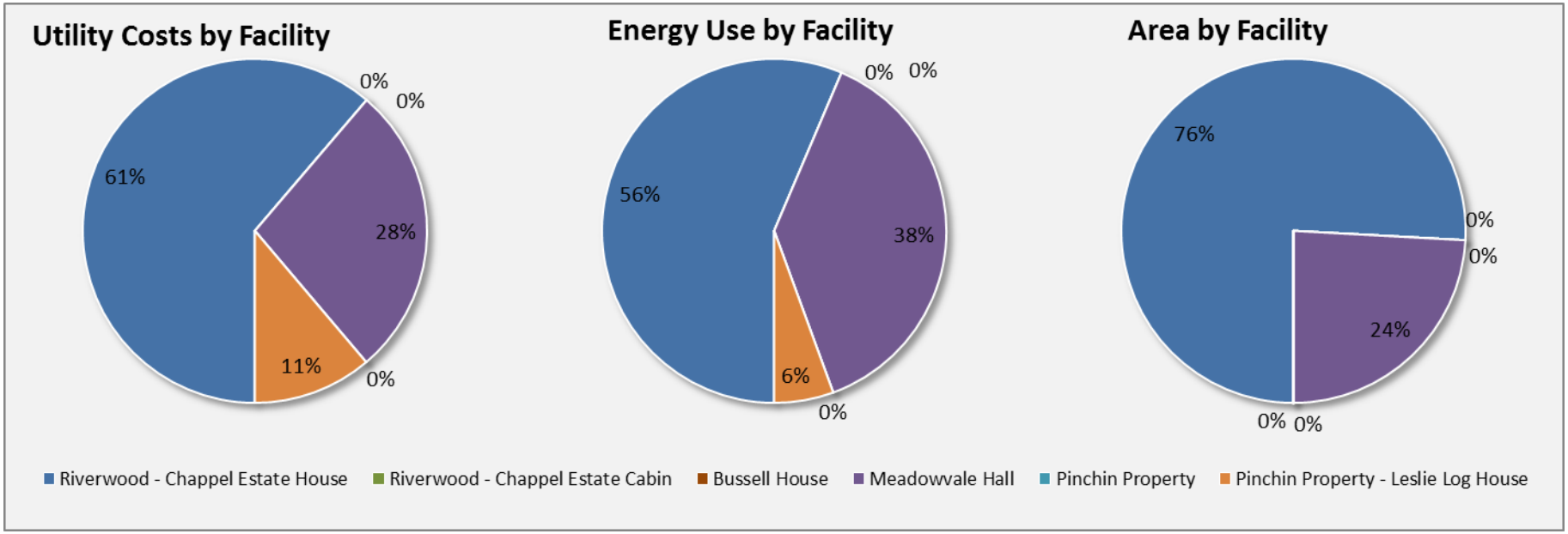


9.3 ENERGY AND GHG BREAKDOWN FOR HERITAGE BUILDINGS

This section provides a brief overview/recap of the Utility and GHG data for **Heritage Buildings**. The table below summarizes, by facility, the utility usage and GHG emissions for 2018. Following are the key takeaways:

- The Riverwood Chappel Estate House represents the largest area in the group and contributes towards 56% and 61% of the energy consumption and utility costs respectively in the group
- The Meadowvale Hall is the second largest area in the group and contributes towards 38% and 28% of the energy consumption and utility costs respectively in the group

Figure 8-4: Utility Costs and Energy Use Breakdown by Facility



2018 Annual Report for Heritage Buildings

Facility	Area	Electricity		Natural Gas		Total Energy	Water		Total Costs	GHG Emissions
	m^2	kWh	$	m^3	$	e-kWh	m^3	$	$	kg
Riverwood - Chappel Estate House	786	81,185	$9,217	11,887	$4,003	**206,002**	1,217	$1,756	**$14,976**	25,402
Riverwood - Chappel Estate Cabin	0	0	$0	0	$0	**0**	0	$0	**$0**	0
Bussell House	0	0	$0	0	$0	**0**	0	$0	**$0**	0
Meadowvale Hall	250	13,846	$2,018	11,909	$4,504	**138,885**	90	$219	**$6,741**	23,017
Pinchin Property	0	0	$0	0	$0	**0**	0	$0	**$0**	0
Pinchin Property - Leslie Log House	0	20,353	$2,692	0	$0	**20,353**	30	$43	**$2,735**	733
Totals	1,036	115,384	$13,927	23,796	$8,507	**365,240**	1,337	$2,018	**$24,451**	49,152
Usage / Costs per m^2:		91.7	$10.8	23.0	$8.2	**333**	1.3	$1.9	**$21.0**	46.7

9.4 ACTION PLAN

No action plan has been identified with the goal to save on electricity, natural gas, oil, and/or other form of energy consumption due to the historic and heritage-designation of the facilities in this group.

9.5 ESTIMATED SAVINGS

Since no action plan exists for this category, no savings are expected.

9.6 PROGRESS TO TARGETS

The City is not targeting any reduction in energy use in **Heritage Buildings** by 2023 over the base year, 2018. However, the energy consumption data will be reported each year for **Heritage Buildings** and will be based on utility meters. Since utility meters monitor energy consumption for the entire facility, the measurement boundary will encompass all parts of the facility. To determine the savings and fairly compare year-to-year energy consumption data, it is important to account for independent variables such as weather and occupancy and apply regression analysis to consumption data. Therefore, actual consumption data for each year starting 2019 will be adjusted to match the weather and occupancy of 2018. The figures below show the updated progress for each year against the set target.

Figure 9-7: Annual Energy Use vs Targeted Energy Use for Heritage Buildings

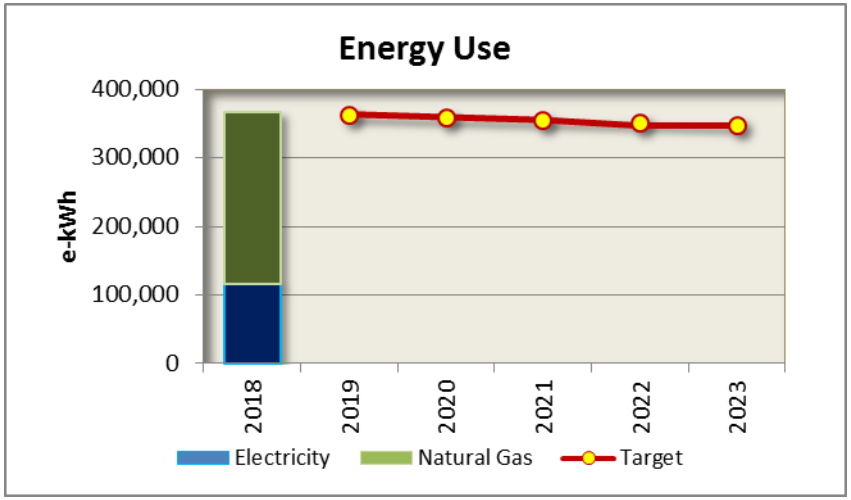
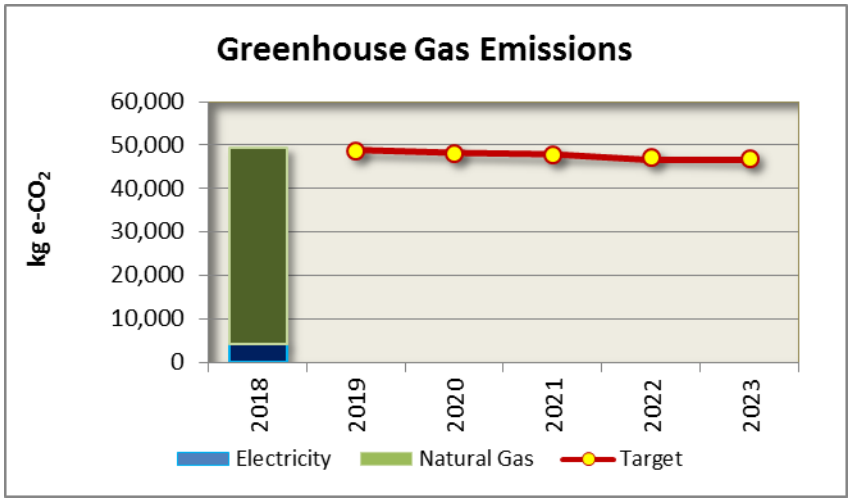


Figure 9-8: Annual GHG Emissions vs Targets for Heritage Buildings



9.7 FACILITY INFORMATION FOR HERITAGE BUILDINGS

Facility: Riverwood - Chappel Estate House

Address: 1447 Burnhamthorpe Rd W, L5C 2S7

Area (m^2): 786 Area (ft^2): 13,326

Year Built: 1919 Hours per Week : 70

Facility Group: Heritage

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	82,651	88,056	81,185
Electricity ($)	$13,111	$12,204	$9,217
Natural Gas (m^3)	0	4,584	11,887
Natural Gas ($)	$0	$1,745	$4,003
Water (m^3)	1,183	1,171	1,217
Water ($)	$1,483	$1,542	$1,756
Total Costs ($)	$14,594	$15,490	$14,976
Total e-kWh	82,651	136,186	206,002
Total e-kWh/m^2	105.2	173.3	262.1
GHG (kg/Yr)	2,975	11,838	25,402
GHG (kg/Yr/m^2)	*4*	*15*	*32*

Energy Measures

Facility: Meadowvale Hall

Address: 6970 Second Line W, L5W 1A1

Area (m^2): 250 Area (ft^2): 2,691

Year Built: 1871 Hours per Week : 72

Facility Group: Heritage

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	15,588	10,304	13,846
Electricity ($)	$2,879	$1,886	$2,018
Natural Gas (m^3)	10,909	12,955	11,909
Natural Gas ($)	$3,674	$4,440	$4,504
Water (m^3)	73	60	90
Water ($)	$161	$138	$219
Total Costs ($)	$6,714	$6,463	$6,741
Total e-kWh	130,138	146,329	138,885
Total e-kWh/m^2	520.6	585.3	555.5
GHG (kg/Yr)	21,191	24,868	23,017
GHG (kg/Yr/m^2)	*85*	*99*	*92*

Energy Measures

Facility: Pinchin Property - Leslie Log House

Address 4415 Mississauga Road, L5M 7C6

Area (m^2): Area (ft^2):

Year Built: 1826 Hours per Week : 0

Facility Group: Heritage

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	15,295	18,014	20,353
Electricity ($)	$3,744	$3,027	$2,692
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	64	261	30
Water ($)	$80	$345	$43
Total Costs ($)	$3,824	$3,372	$2,735
Total e-kWh	15,295	18,014	20,353
Total e-kWh/m^2	N/A	N/A	N/A
GHG (kg/Yr)	551	648	733
GHG (kg/Yr/m^2)	*N/A*	*N/A*	*N/A*

Energy Measures

10.0 LEASED FACILITIES AND PROPERTIES

10.1 SCOPE AND BOUNDARY

For the purposes of this report, the City of Mississauga has 9 facilities/locations that fall under this category. They include:

- Front Street Pumping Station
- Harding Estate
- Mary Fix House
- Old Fire Hall - Malton (Malton Boy Scouts)
- Riverwood - Art Studio (Visual Arts Mississauga)
- Riverwood - McEwan Estate House
- Riverwood - McEwan Estate Barn
- Russell Langmaid Property
- Sheridan College Parking Lot

The above listed locations have a total floor area of approximately 2,900 square meters. This would account for 0.6% of the total building area for City of Mississauga facilities included in this Plan.

10.2 BASELINE

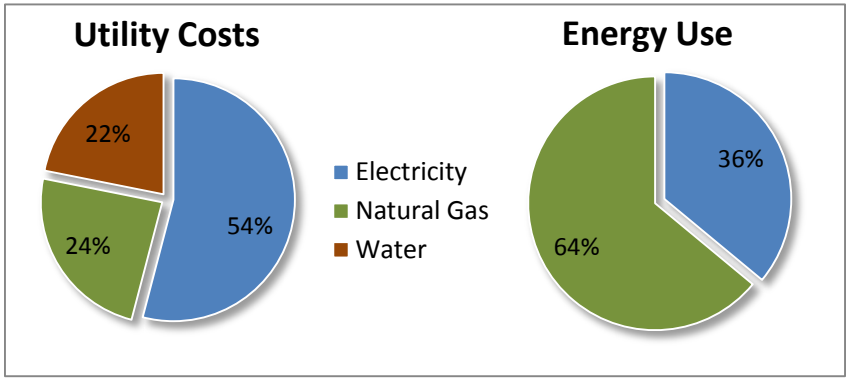
10.2.1 ENERGY USE

The energy use (combined electricity and natural gas) for **Leased Facilities and Properties** was 1,131,000 equivalent kilowatt hours in 2018. Following are the key takeaways for the energy usage in 2018:

- 36% of the total energy usage was due to electricity use, which has increased by 10.3% since 2013
- 64% of the total energy usage was due to natural gas use, which has increased by 1.1% since 2013
- A total of $89,000 in utility costs was incurred, out of which 54% is attributed to electricity, 24% to natural gas, and 22% to water

Leased Facilities and Properties accounted for 0.5% of the City's total utility budget for 2018.

Figure 10-1: Utility Costs and Energy Use Breakdown for Leased Facilities and Properties



10.2.2 ENERGY USE INTENSITY

Energy Use Intensity (EUI) is a measurement that expresses a building's energy use as a function of its size or other characteristic. It is used to give a better picture of the energy efficiency of a facility. The lower the EUI, the more efficient the facility is.

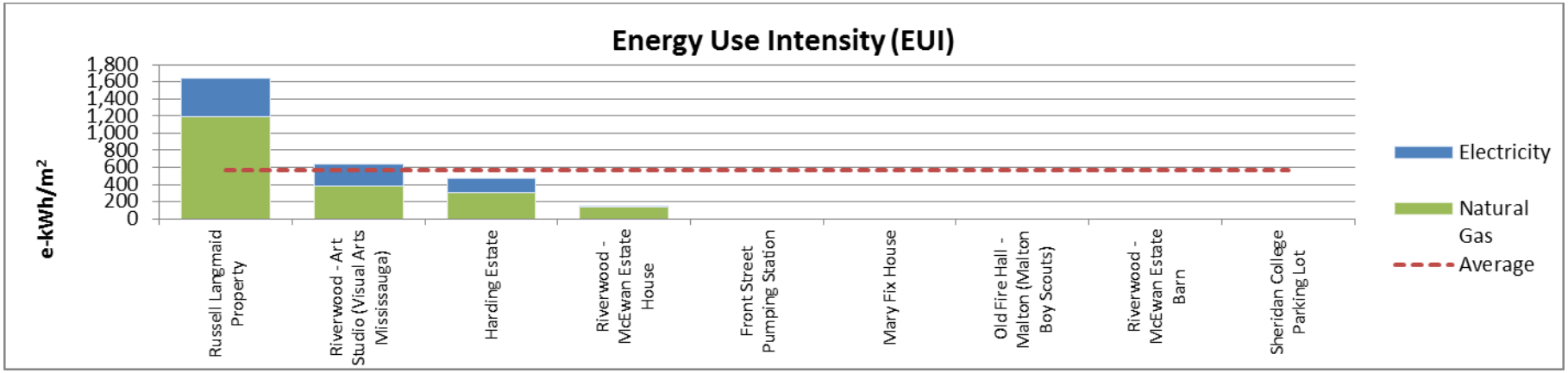
When reviewing EUI, the facility operation type and hours should be taken into account. For example, a facility that operates 24 hours a day will most likely have a higher EUI than a similar one that operates 8 hours a day. Similarly, a facility that has high energy using systems that do not contribute to the building area, such as an outdoor pool or

outdoor ice rink, will have a higher EUI than a facility where those systems are located within the facility, as they would add to the facility's area footprint.

For **Heritage Buildings** the average EUI in 2018 was 570.2 e-kWh/m2.

The following chart shows the EUI for each facility within **Leased Facilities and Properties**, and compares it to the average for the group.

Figure 10-2: Energy Use Intensity for Leased Facilities and Properties



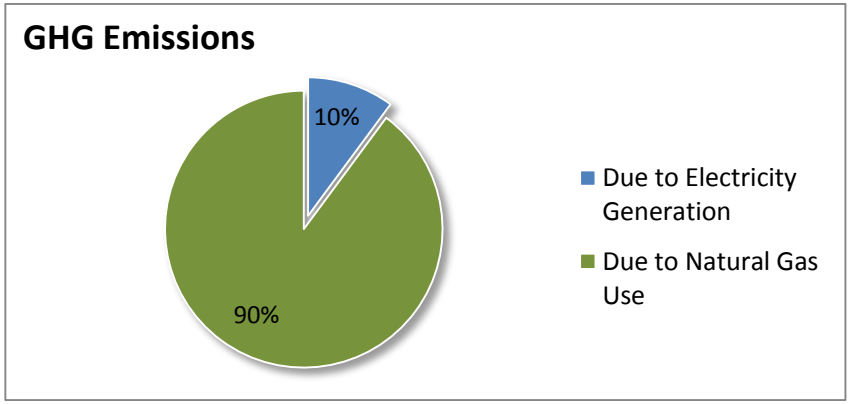
Note: The Average EUI value is calculated by taking the total energy use of all facilities, and dividing by the total area of the facilities. As such, a larger facility would have a bigger impact on the average than a smaller facility.

10.2.3 GREENHOUSE GAS (GHG) EMISSIONS

For 2018, **Leased Facilities and Properties** emitted 145,000 kg (or 145 tonnes) of CO2 in 2018. 10.1% of these emissions were due to the generation of electricity, while the use of natural gas accounted for the remaining 89.9%.

Leased Facilities and Properties accounted for 0.7% of the City's total GHG emissions for facilities included in the plan.

Figure 10-3: GHG Emissions Breakdown for Leased Facilities and Properties

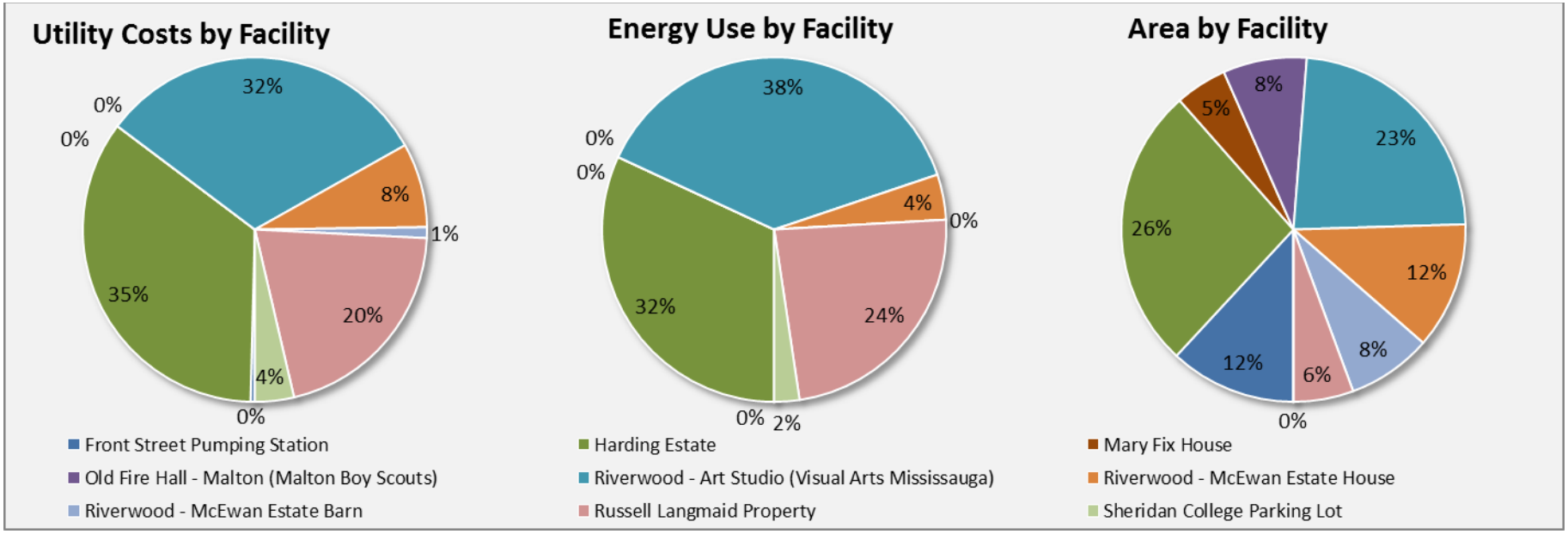


10.3 ENERGY AND GHG BREAKDOWN FOR LEASED FACILITIES AND PROPERTIES

This section provides a brief overview/recap of the Utility and GHG data for **Leased Facilities and Properties**. The table below summarizes, by facility, the utility usage and GHG emissions for 2018.

- The Harding Estate represents the largest area in the group and contributes towards 32% and 35% of the energy consumption and utility costs respectively in the group
- The Riverwood Art Studio is the second largest area in the group and contributes towards 38% and 32% of the energy consumption and utility costs respectively in the group

Figure 8-4: Utility Costs and Energy Use Breakdown by Facility



2018 Annual Report for Leased Facilities and Properties

Facility	Area	Electricity		Natural Gas		Total Energy	Water		Total Costs	GHG Emissions
	m^2	kWh	$	m^3	$	e-kWh	m^3	$	$	kg
Front Street Pumping Station	342	0	$0	0	$0	**0**	252	$360	**$360**	0
Harding Estate	764	132,476	$15,610	21,766	$6,506	**361,017**	6,094	$8,745	**$30,861**	45,928
Mary Fix House	140	0	$0	0	$0	**0**	0	$0	**$0**	0
Old Fire Hall - Malton (Malton Boy Scouts)	226	0	$0	0	$0	**0**	0	$0	**$0**	0
Riverwood - Art Studio (Visual Arts Mississauga)	669	173,381	$19,293	24,335	$7,133	**428,897**	638	$1,560	**$27,986**	52,259
Riverwood - McEwan Estate House	342	664	$588	4,525	$2,084	**48,181**	1,966	$4,339	**$7,011**	8,581
Riverwood - McEwan Estate Barn	228	0	$0	0	$0	**0**	364	$900	**$900**	0
Russell Langmaid Property	162	74,200	$9,162	18,301	$5,580	**266,364**	1,421	$3,459	**$18,201**	37,279
Sheridan College Parking Lot	0	26,683	$3,233	0	$0	**26,683**	0	$0	**$3,233**	961
Totals	2,873	407,404	$47,886	68,927	$21,303	**1,131,141**	10,736	$19,363	**$88,551**	145,008
Usage / Costs per m^2:		196.6	$23.1	35.6	$11.0	**570**	4.3	$7.7	**$34.0**	74.4

10.4 ACTION PLAN

No action plan has been identified with the goal to save on electricity, natural gas, oil, and/or other form of energy consumption since the facilities are operated and occupied by another entity.

10.5 ESTIMATED SAVINGS

Since no action plan exists for this category, no savings are expected.

10.6 PROGRESS TO TARGETS

The City is not targeting any reduction in energy use in **Leased Facilities and Properties** by 2023 over the base year, 2018. However, the energy consumption data will be reported each year for **Leased Facilities and Properties** and will be based on utility meters. Since utility meters monitor energy consumption for the entire facility, the measurement boundary will encompass all parts of the facility. To determine the savings and fairly compare year-to-year energy consumption data, it is important to account for independent variables such as weather and occupancy and apply regression analysis to consumption data. Therefore, actual consumption data for each year starting 2019 will be adjusted to match the weather and occupancy of 2018. The figures below show the updated progress for each year against the set target.

Figure 9-7: Annual Energy Use vs Targeted Energy Use for Leased Facilities and Properties

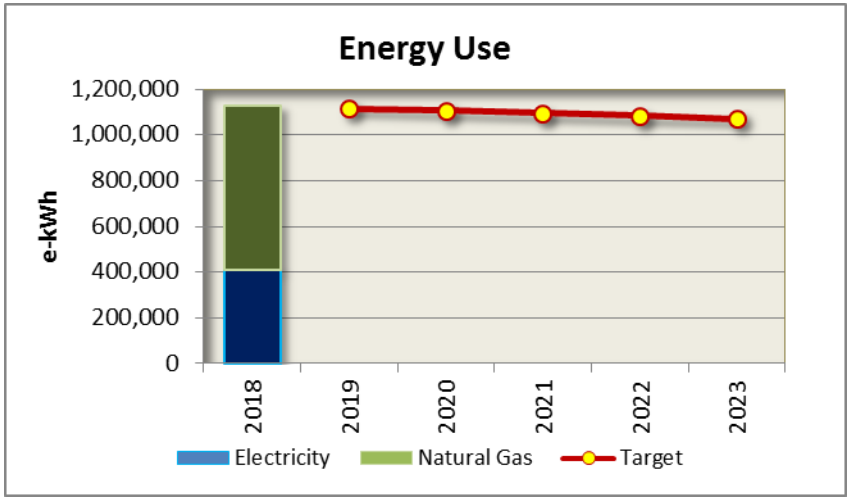
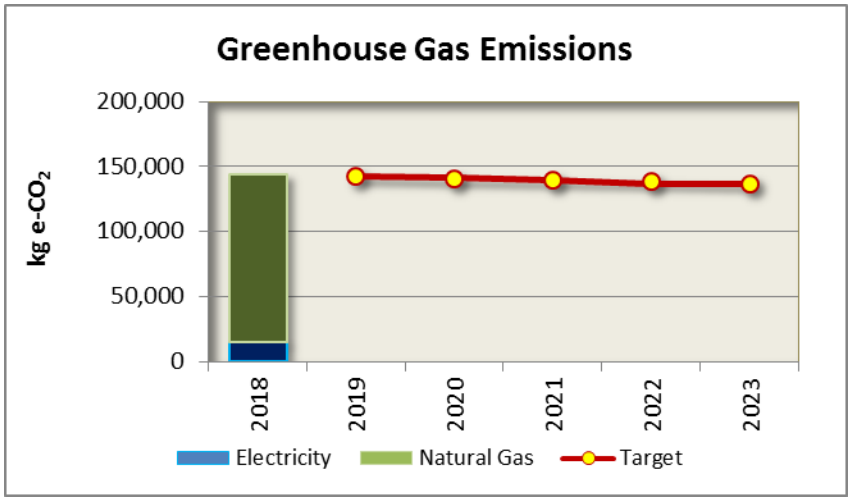


Figure 9-8: Annual GHG Emissions vs Targets for Leased Facilities and Properties



10.7 FACILITY INFORMATION FOR LEASED FACILITIES AND PROPERTIES

Facility: Front Street Pumping Station

Address: 105 Lakeshore Rd W, L5H 1E9

Area (m^2): 342 Area (ft^2): 3,681

Year Built: 1990 Hours per Week : 70

Facility Group: Leased Properties

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	0	0	0
Electricity ($)	$0	$0	$0
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	351	290	252
Water ($)	$438	$381	$360
Total Costs ($)	$438	$381	$360
Total e-kWh	0	0	0
Total e-kWh/m^2	0.0	0.0	0.0
GHG (kg/Yr)	0	0	0
GHG (kg/Yr/m^2)	*0*	*0*	*0*

Energy Measures

Facility: Harding Estate

Address: 2700 Lakeshore Rd W, L5J 1K3

Area (m^2): 764 Area (ft^2): 8,224

Year Built: Hours per Week :

Facility Group: Leased Properties

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	120,034	119,789	132,476
Electricity ($)	$21,156	$16,436	$15,610
Natural Gas (m^3)	18,426	21,404	21,599
Natural Gas ($)	$5,473	$6,599	$6,506
Water (m^3)	4,314	5,746	6,094
Water ($)	$5,411	$7,586	$8,745
Total Costs ($)	$32,040	$30,621	$30,861
Total e-kWh	313,507	344,528	359,261
Total e-kWh/m^2	410.3	451.0	470.2
GHG (kg/Yr)	39,165	44,787	45,612
GHG (kg/Yr/m^2)	*51*	*59*	*60*

Energy Measures

Facility: Riverwood - Art Studio (Visual Arts Mississauga)

Address: 4170 Riverwood Park Lane, L5C 2S7

Area (m^2): 669 Area (ft^2): 7,201

Year Built: Hours per Week :

Facility Group: Leased Properties

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	167,027	169,040	173,381
Electricity ($)	$26,286	$22,985	$19,293
Natural Gas (m^3)	22,912	23,885	24,151
Natural Gas ($)	$6,655	$7,381	$7,133
Water (m^3)	587	473	638
Water ($)	$1,286	$1,083	$1,560
Total Costs ($)	$34,226	$31,450	$27,986
Total e-kWh	407,601	419,834	426,967
Total e-kWh/m^2	609.3	627.6	638.2
GHG (kg/Yr)	49,339	51,252	51,911
GHG (kg/Yr/m^2)	*74*	*77*	*78*

Energy Measures

Facility: Riverwood - McEwan Estate Barn

Address , L5C 2S7

Area (m^2): 228 Area (ft^2): 4,273

Year Built: Hours per Week :

Facility Group: Leased Properties

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	0	0	0
Electricity ($)	$0	$0	$0
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	119	342	364
Water ($)	$248	$788	$900
Total Costs ($)	$248	$788	$900
Total e-kWh	0	0	0
Total e-kWh/m^2	0.0	0.0	0.0
GHG (kg/Yr)	0	0	0
GHG (kg/Yr/m^2)	*0*	*0*	*0*

Energy Measures

Facility: Russell Langmaid Property

Address: 170 Church St, L5M 1M6

Area (m^2): 162 Area (ft^2): 1,744

Year Built: 0 Hours per Week : 0

Facility Group: Leased Properties

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	73,589	66,296	71,861
Electricity ($)	$12,287	$10,572	$9,162
Natural Gas (m^3)	19,824	21,159	18,173
Natural Gas ($)	$6,786	$6,250	$5,580
Water (m^3)	791	1,124	1,421
Water ($)	$1,713	$2,580	$3,459
Total Costs ($)	$20,787	$19,403	$18,201
Total e-kWh	281,742	288,461	262,681
Total e-kWh/m^2	1,739.1	1,780.6	1,621.5
GHG (kg/Yr)	40,137	42,397	36,953
GHG (kg/Yr/m^2)	*248*	*262*	*228*

Energy Measures

Facility:	Sheridan College Parking Lot
Address	4219 Living Arts Dr,
Area (m^2):	Area (ft^2):
Year Built:	Hours per Week :
Facility Group:	Leased Properties
Building Components:	

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	21,383	29,899	26,683
Electricity ($)	$4,604	$4,395	$3,233
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$4,604	$4,395	$3,233
Total e-kWh	21,383	29,899	26,683
Total e-kWh/m^2	N/A	N/A	N/A
GHG (kg/Yr)	770	1,076	961
GHG (kg/Yr/m^2)	*N/A*	*N/A*	*N/A*

Energy Measures

11.0 LIBRARIES

11.1 SCOPE AND BOUNDARY

The Libraries Group includes all facilities that act as standalone libraries. Libraries located in a community centre are listed under that community centre and would not be included in this section.

For the purposes of this report, the City of Mississauga has 11 facilities/locations that fall under this category. They include:

- Burnhamthorpe Library & Maja Prentice Theatre
- Churchill Meadows Library
- Lakeview Library
- Lorne Park Library
- Meadowvale Library
- Mississauga Central Library
- Port Credit Library
- Sheridan Library
- Streetsville Library
- Woodlands Library
- Woodlands Library (old)

The above listed locations have a total floor area of approximately 46,800 square meters. This would account for 10.1% of the total building area for City of Mississauga facilities included in this Plan.

11.2 BASELINE

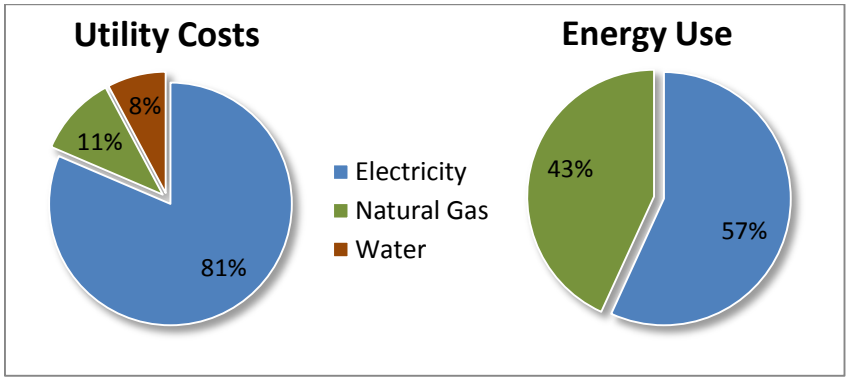
11.2.1 ENERGY USE

The energy use (combined electricity and natural gas) for **Libraries** was 8,390,000 equivalent kilowatt hours in 2018. Following are the key takeaways for the energy usage in 2018:

- 43% of the total energy usage was due to electricity use, which has dropped by 4.0% since 2013
- 57% of the total energy usage was due to natural gas use, which has increased by 2.2% since 2013
- A total of $850,000 in utility costs was incurred, out of which 81% is attributed to electricity, 11% to natural gas, and 8% to water

Libraries accounted for 4.7% of the City's total utility budget for 2018.

Figure 11-1: Utility Costs and Energy Use Breakdown for Libraries



11.2.2 ENERGY USE INTENSITY

Energy Use Intensity (EUI) is a measurement that expresses a building's energy use as a function of its size or other characteristic. It is used to give a better picture of the energy efficiency of a facility. The lower the EUI, the more efficient the facility is.

When reviewing EUI, the facility operation type and hours should be taken into account. For example, a facility that operates 24 hours a day

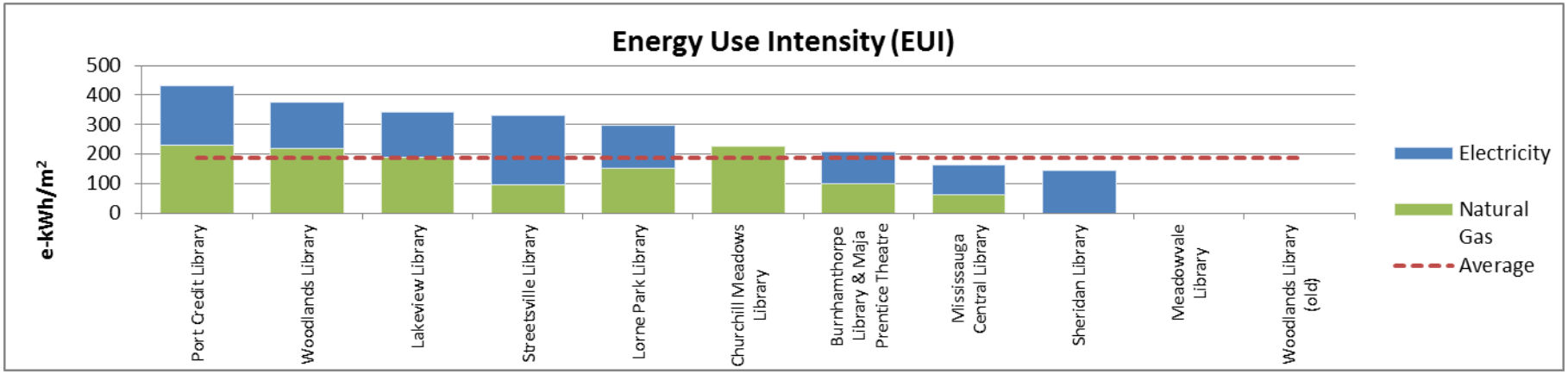
will most likely have a higher EUI than a similar one that operates 8 hours a day. Similarly, a facility that has high energy using systems that do not contribute to the building area, such as an outdoor pool or outdoor ice rink, will have a higher EUI than a facility where those systems are located within the facility, as they would add to the facility's area footprint.

For **Libraries** the average EUI in 2018 was 187.4 e-kWh/m2.

The following chart shows the EUI for each facility within **Libraries**, and compares it to the average for the group.

Note: The Average EUI value is calculated by taking the total energy use of all facilities, and dividing by the total area of the facilities. As such, a larger facility would have a bigger impact on the average than a smaller facility.

Figure 11-2: Energy Use Intensity for Libraries

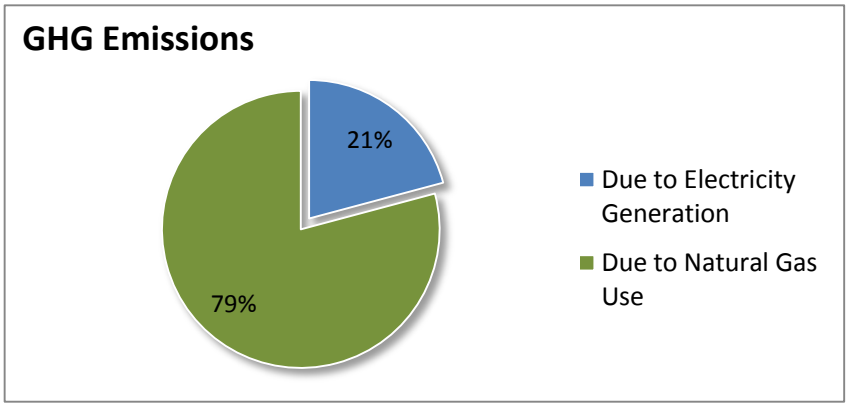


11.2.3 GREENHOUSE GAS (GHG) EMISSIONS

For 2018, **Libraries** emitted 823,900 kg (or 824 tonnes) of CO2 in 2018. 20.8% of these emissions were due to the generation of electricity, while the use of natural gas accounted for the remaining 79.2%.

Libraries accounted for 4.2% of the City's total GHG emissions for facilities included in the plan.

Figure 11-3: GHG Emissions Breakdown for Libraries

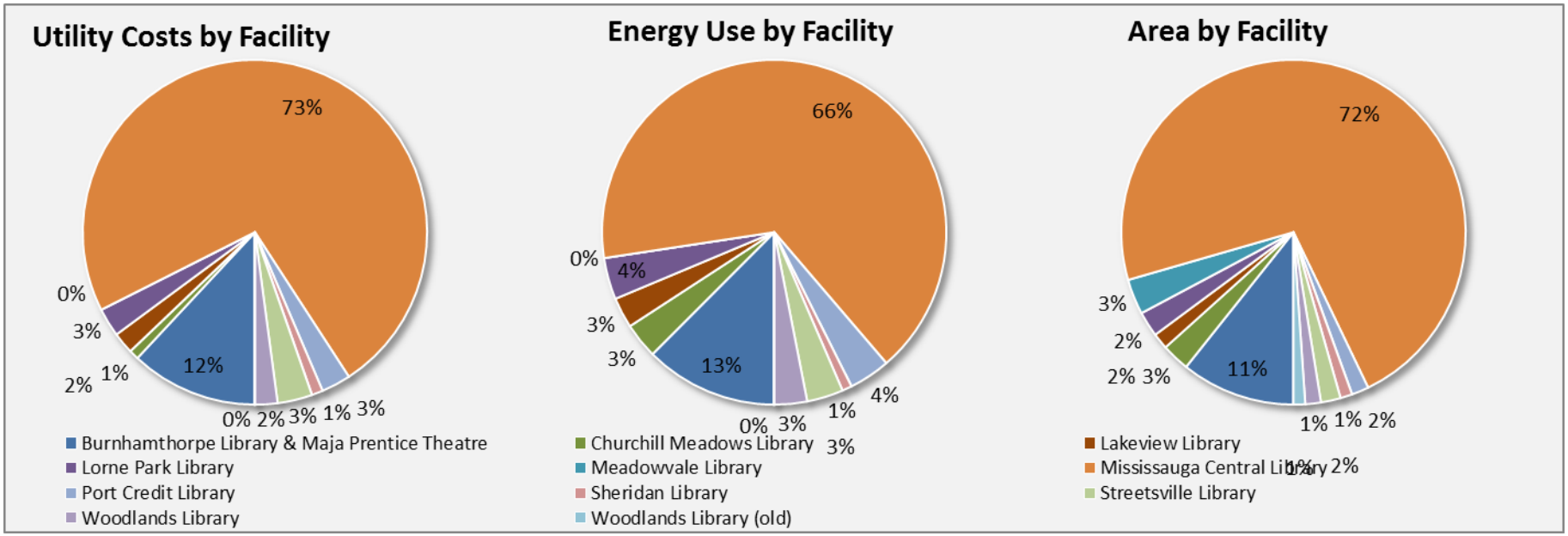


11.3 ENERGY AND GHG BREAKDOWN FOR LIBRARIES

This section provides a brief overview/recap of the Utility and GHG data for **Libraries**. The table below summarizes, by facility, the utility usage and GHG emissions for 2018. Following are the key takeaways:

- Mississauga Central Library is by far the largest facility in this group by area and represents the largest energy consumption (66%) and utility consumption (73%) in this group
- Burnhamthorpe Library & Maja Prentice Theatre represents the second largest facility by area in this group and contributes 13% and 12% towards the energy consumption and utility consumption in the group
- The remaining nine (9) libraries represent 17% of the facility area in the group and contribute 21% and 15% towards the energy consumption and utility consumption in the group
- Electrical loads such as lighting and fan energy dominate the energy usage in this group
- For this reason, priority was given to the two electricity reduction projects for previous and future planned projects since they greatly reduce utility budget and energy usage

Figure 11-4: Utility Costs and Energy Use Breakdown by Facility



2018 Annual Report for Libraries

Facility	Area	Electricity		Natural Gas		Total Energy	Water		Total Costs	GHG Emissions
	m^2	kWh	$	m^3	$	e-kWh	m^3	$	$	kg
Burnhamthorpe Library & Maja Prentice Theatre	5,024	542,609	$85,383	48,169	$12,999	**1,048,383**	1,375	$3,337	**$101,719**	110,621
Churchill Meadows Library	1,232	0	$0	26,625	$7,731	**279,557**	0	$0	**$7,731**	50,347
Lakeview Library	705	106,446	$12,331	12,768	$4,404	**240,513**	150	$363	**$17,098**	27,977
Lorne Park Library	1,108	161,378	$17,672	15,869	$4,494	**328,001**	275	$669	**$22,834**	35,818
Meadowvale Library	1,552	0	$0	0	$0	**0**	0	$0	**$0**	0
Mississauga Central Library	33,877	3,419,862	$514,286	202,537	$48,731	**5,546,501**	24,128	$59,348	**$622,364**	506,113
Port Credit Library	754	150,498	$17,434	16,657	$5,206	**325,396**	337	$820	**$23,460**	36,916
Sheridan Library	525	76,565	$8,982	0	$0	**76,565**	0	$0	**$8,982**	2,756
Streetsville Library	867	203,184	$23,456	8,005	$3,033	**287,240**	516	$1,266	**$27,754**	22,453
Woodlands Library	686	107,861	$12,565	14,284	$4,777	**257,841**	228	$554	**$17,897**	30,894
Woodlands Library (old)	511	0	$0	0	$0	**0**	0	$0	**$0**	0
Totals	46,841	4,768,404	$692,109	344,914	$91,375	**8,389,998**	27,009	$66,356	**$849,840**	823,894
Usage / Costs per m^2:		109.5	$15.9	7.8	$2.1	**187**	0.6	$1.5	**$19.0**	18.4

11.4 ACTION PLAN

An action plan has been identified with the goal to save on electricity, natural gas, oil, and/or other form of energy consumption within a facility or location.

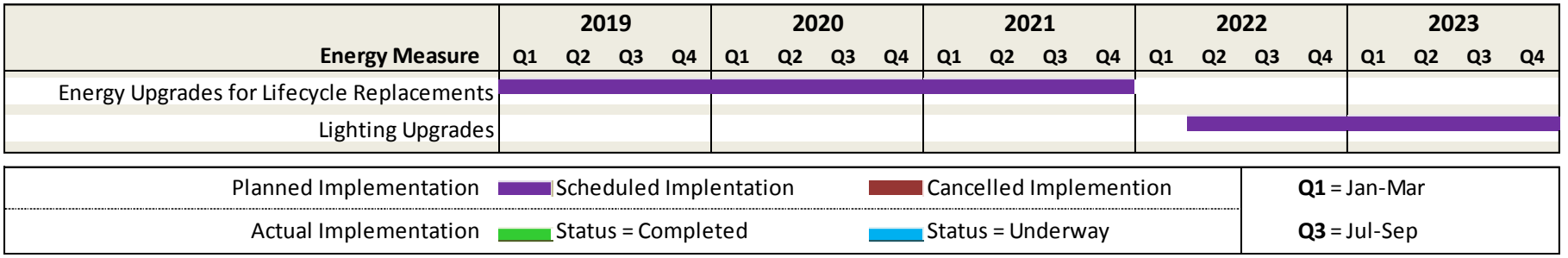
The following figure shows the various projects and initiatives that have been planned for **Libraries**. The chart shows what projects have been planned, when they are planned to be implemented, and the progress of implementation (if applicable). A brief description of each project has been noted below:

- **Energy Upgrades for Lifecycle Replacements**: Includes energy upgrades for high capital assets that show economic paybacks only at the time of replacement like envelope and HVAC equipment
- **Lighting Upgrades**: Includes replacement of existing lighting technologies to newer technologies like LEDs, and better controls through localized sensors and BAS scheduling

For the chart below, the **Purple** coloured bars represent the original planned start and completion of a Measure type. The **Green** bar beneath shows the actual start and completion times for a completed measure, while the **Blue** bar shows the actual start time of a Measure that is currently being implemented, but not yet complete. Some Notes:

- A Single Measure timeline may include more than one implementation of that measure (example: In different facilities).
- Due to changing circumstances (change in operations, budget changes, new technology, etc.), a planned measure may be cancelled. These would be indicated by a **Red** plan bar on the chart.

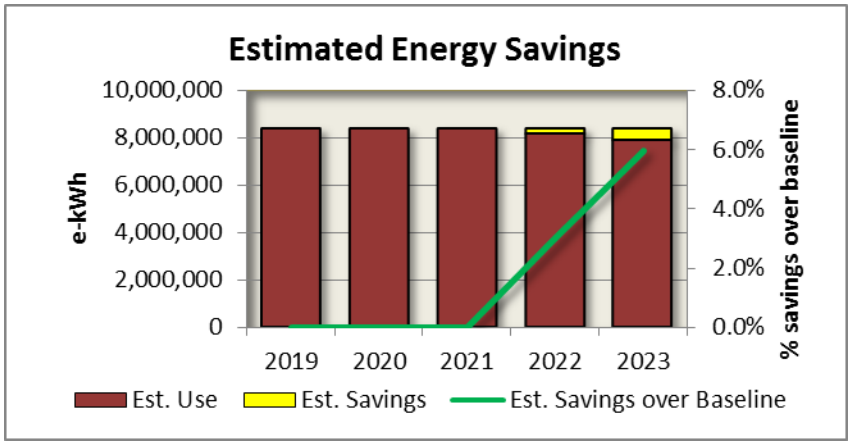
Figure 11-5: Energy Measure Implementation Plan for Libraries



11.5 ESTIMATED SAVINGS

At the end of the plan, **Libraries** are expected to save 6.0% over the base year of 2018, which amounts to a total of $69,000 from all the projects.

Figure 11-6: Energy Measure Annual Savings for Libraries



11.6 PROGRESS TO TARGETS

The City is targeting a 6.0% reduction in energy use in **Libraries** by 2023 over the base year, 2018. The reporting of energy consumption data and savings for **Libraries** will be based on utility meters and assembled annually. Since utility meters monitor energy consumption for the entire facility, the measurement boundary will encompass all parts of the facility. To determine the savings and fairly compare year-to-year energy consumption data, it is important to account for independent variables such as weather and occupancy and apply regression analysis to consumption data. Therefore, actual consumption data for each year starting 2019 will be adjusted to match the weather and occupancy of 2018. The figures below show the updated progress for each year against the set target.

Figure 11-7: Annual Energy Use vs Targeted Energy Use for Libraries

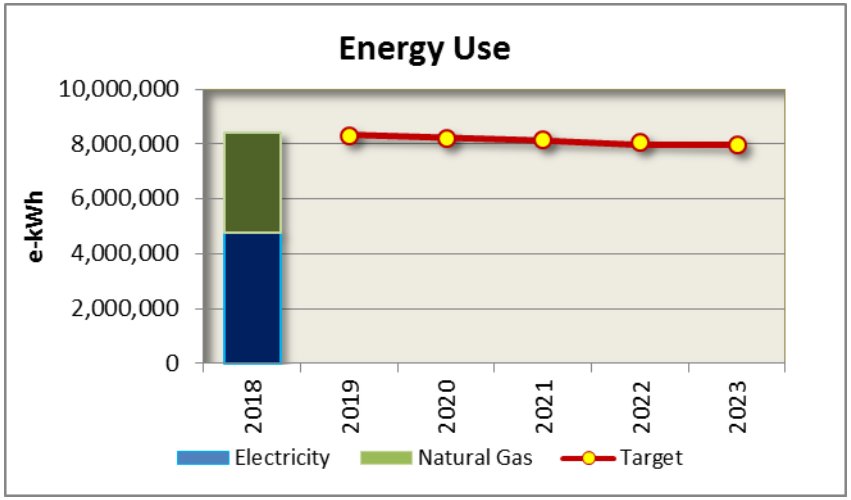
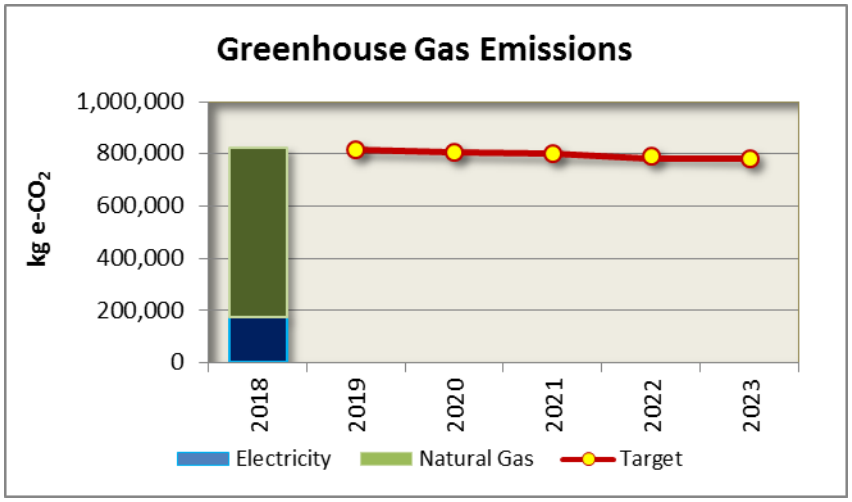


Figure 11-8: Annual GHG Emissions vs Targets for Libraries



11.7 FACILITY INFORMATION FOR LIBRARIES

Facility: Burnhamthorpe Library & Maja Prentice Theatre

Address 3650 Dixie Rd, L4Y 3V9

Area (m^2): 5,024 Area (ft^2): 54,078

Year Built: 1976 Hours per Week : 72

Facility Group: Library

Building Components: Library; Theatre

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	535,744	528,336	542,609
Electricity ($)	$87,885	$85,835	$85,383
Natural Gas (m^3)	51,761	53,924	48,169
Natural Gas ($)	$13,149	$15,568	$12,999
Water (m^3)	1,868	2,017	1,375
Water ($)	$4,069	$4,597	$3,337
Total Costs ($)	$105,103	$106,000	$101,719
Total e-kWh	1,079,237	1,094,537	1,048,383
Total e-kWh/m^2	214.8	217.9	208.7
GHG (kg/Yr)	117,167	120,990	110,621
GHG (kg/Yr/m^2)	*23*	*24*	*22*

Energy Measures

Lighting Upgrades

Facility: Churchill Meadows Library

Address: 3801 Thomas St., L5M 7G2

Area (m^2): 1,232 Area (ft^2): 13,261

Year Built: 2008 Hours per Week : 72

Facility Group: Library

Building Components: Library

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	0	0	0
Electricity ($)	$0	$0	$0
Natural Gas (m^3)	26,155	24,690	26,625
Natural Gas ($)	$7,532	$7,396	$7,731
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$7,532	$7,396	$7,731
Total e-kWh	274,625	259,241	279,557
Total e-kWh/m^2	222.9	210.4	226.9
GHG (kg/Yr)	49,459	46,688	50,347
GHG (kg/Yr/m^2)	*40*	*38*	*41*

Energy Measures

Lighting Upgrades

Facility: Lakeview Library

Address: 1110 Atwater Ave, L5E 1M9

Area (m^2): 705 Area (ft^2): 7,589

Year Built: 1967 Hours per Week : 49

Facility Group: Library

Building Components: Library

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	103,993	105,153	106,446
Electricity ($)	$18,055	$14,943	$12,331
Natural Gas (m^3)	12,384	12,063	12,768
Natural Gas ($)	$3,863	$4,145	$4,404
Water (m^3)	155	153	150
Water ($)	$338	$349	$363
Total Costs ($)	$22,255	$19,437	$17,098
Total e-kWh	234,023	231,816	240,513
Total e-kWh/m^2	331.9	328.8	341.2
GHG (kg/Yr)	27,162	26,597	27,977
GHG (kg/Yr/m^2)	*39*	*38*	*40*

Energy Measures

Facility: Lorne Park Library

Address: 1474 Truscott Dr, L5J 1Z2

Area (m^2): 1,108 Area (ft^2): 11,926

Year Built: 1967 Hours per Week : 72

Facility Group: Library

Building Components: Library

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	139,879	151,828	161,378
Electricity ($)	$24,505	$22,719	$17,672
Natural Gas (m^3)	24,167	28,644	15,869
Natural Gas ($)	$6,771	$8,320	$4,494
Water (m^3)	257	297	275
Water ($)	$581	$679	$669
Total Costs ($)	$31,857	$31,718	$22,834
Total e-kWh	393,627	452,591	328,001
Total e-kWh/m^2	355.3	408.5	296.0
GHG (kg/Yr)	50,735	59,632	35,818
GHG (kg/Yr/m^2)	*46*	*54*	*32*

Energy Measures

Facility: Meadowvale Library

Address 6677 Meadowvale T.Cen., L5N 2R5

Area (m^2): 1,552 Area (ft^2): 16,706

Year Built: 2002 Hours per Week : 69

Facility Group: Library

Building Components: Library

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	141,628	0	0
Electricity ($)	$24,310	$0	$0
Natural Gas (m^3)	19,751	9,298	0
Natural Gas ($)	$6,407	$3,105	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$30,717	$3,105	$0
Total e-kWh	349,009	97,631	0
Total e-kWh/m^2	224.9	62.9	0.0
GHG (kg/Yr)	42,447	17,583	0
GHG (kg/Yr/m^2)	*27*	*11*	*0*

Energy Measures

Facility: Mississauga Central Library

Address: 301 Burnhamthorpe, L5B 3Y3

Area (m^2): 33,877 Area (ft^2): 364,649

Year Built: 1990 Hours per Week : 64

Facility Group: Library

Building Components: Auditorium; Library; Underground Parking

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	3,386,337	3,301,197	3,419,862
Electricity ($)	$538,561	$498,311	$514,286
Natural Gas (m^3)	167,457	168,868	202,537
Natural Gas ($)	$39,683	$44,412	$48,731
Water (m^3)	11,404	10,973	24,128
Water ($)	$24,906	$25,176	$59,348
Total Costs ($)	$603,150	$567,898	$622,364
Total e-kWh	5,144,637	5,074,316	5,546,501
Total e-kWh/m^2	151.9	149.8	163.7
GHG (kg/Yr)	438,570	438,173	506,113
GHG (kg/Yr/m^2)	*13*	*13*	*15*

Energy Measures

Energy Upgrades for Lifecycle Replacements
Metering & Sub-metering Equipment
Operation Optimization
Lighting Upgrades

Facility: Port Credit Library

Address: 20 Lakeshore Rd E, L5G 1C8

Area (m^2): 754 Area (ft^2): 8,116

Year Built: 1962 Hours per Week : 53

Facility Group: Library

Building Components: Library

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	117,756	117,233	150,498
Electricity ($)	$19,556	$16,174	$17,434
Natural Gas (m^3)	22,811	14,956	16,657
Natural Gas ($)	$6,383	$4,848	$5,206
Water (m^3)	337	330	337
Water ($)	$733	$756	$820
Total Costs ($)	$26,672	$21,778	$23,460
Total e-kWh	357,268	274,268	325,396
Total e-kWh/m^2	473.8	363.8	431.6
GHG (kg/Yr)	47,374	32,502	36,916
GHG (kg/Yr/m^2)	*63*	*43*	*49*

Energy Measures

Facility: Sheridan Library

Address: 2225 Erin Mills Parkway #149, L5K 1T9

Area (m^2): 525 Area (ft^2): 5,651

Year Built: 1970 Hours per Week : 57

Facility Group: Library

Building Components: Library

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	76,717	78,320	76,565
Electricity ($)	$12,874	$11,209	$8,982
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$12,874	$11,209	$8,982
Total e-kWh	76,717	78,320	76,565
Total e-kWh/m^2	146.1	149.2	145.8
GHG (kg/Yr)	2,762	2,820	2,756
GHG (kg/Yr/m^2)	*5*	*5*	*5*

Energy Measures

Facility: Streetsville Library

Address: 112 Queen St S, L5M 1K8

Area (m^2): 867 Area (ft^2): 9,332

Year Built: 1967 Hours per Week : 59

Facility Group: Library

Building Components: Library

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	160,527	184,644	203,184
Electricity ($)	$26,301	$25,865	$23,456
Natural Gas (m^3)	9,892	10,255	8,005
Natural Gas ($)	$3,438	$3,646	$3,033
Water (m^3)	887	504	516
Water ($)	$1,946	$1,155	$1,266
Total Costs ($)	$31,686	$30,665	$27,754
Total e-kWh	264,389	292,316	287,240
Total e-kWh/m^2	304.9	337.2	331.3
GHG (kg/Yr)	24,484	26,038	22,453
GHG (kg/Yr/m^2)	*28*	*30*	*26*

Energy Measures

Lighting Upgrades

Facility: Woodlands Library

Address: 3255 Erindale Station Rd, L5C 1L6

Area (m^2): 686 Area (ft^2): 7,384

Year Built: 2014 Hours per Week : 57

Facility Group: Library

Building Components: Library

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	102,496	103,207	107,861
Electricity ($)	$17,827	$14,741	$12,565
Natural Gas (m^3)	10,801	15,699	14,284
Natural Gas ($)	$3,517	$4,969	$4,777
Water (m^3)	240	259	228
Water ($)	$522	$593	$554
Total Costs ($)	$21,866	$20,303	$17,897
Total e-kWh	215,908	268,044	257,841
Total e-kWh/m^2	314.7	390.7	375.9
GHG (kg/Yr)	24,115	33,402	30,894
GHG (kg/Yr/m^2)	*35*	*49*	*45*

Energy Measures

12.0 COMMUNITY HALLS, MARINAS, AND ANIMAL SERVICES

12.1 SCOPE AND BOUNDARY

For the purposes of this report, the City of Mississauga has 16 facilities/locations that fall under this category. They include:

- 69 Church St
- Adamson Estate - Barn
- Adamson Estate - Derry House
- Adamson Estate - Main House
- Animal Services Centre
- Brookmede Centre
- Cawthra Elliot Estate - House
- Clarke Memorial Hall
- Credit Village Marina
- Erindale Community Hall
- Lakefront Promenade Marina
- Lorne Park Hall
- Malton Hall (Victory)
- Mississauga Canoe Club
- Streetsville Village Hall
- Streetsville Kinsmen Hall

The above listed locations have a total floor area of approximately 7,900 square meters. This would account for 1.7% of the total building area for City of Mississauga facilities included in this Plan.

12.2 BASELINE

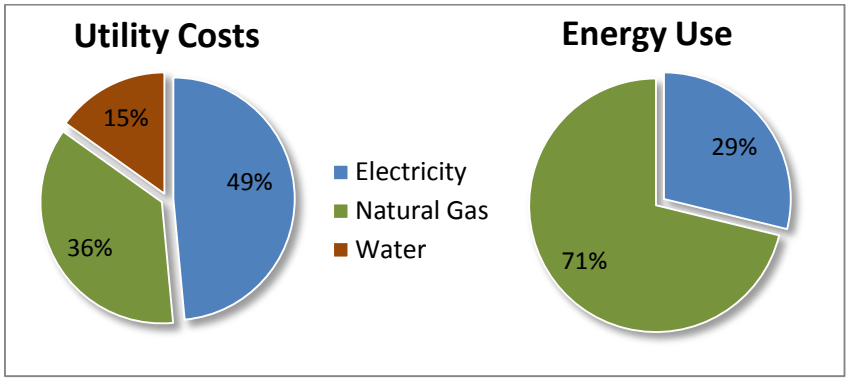
12.2.1 ENERGY USE

The energy use (combined electricity and natural gas) for **Community Halls, Marinas, and Animal Services** was 2,406,000 equivalent kilowatt hours in 2018. Following are the key takeaways for the energy usage in 2018:

- 29% of the total energy usage was due to electricity use, which has increased by 37.6% since 2013
- 71% of the total energy usage was due to natural gas use, which has dropped by 6.4% since 2013
- A total of $166,000 in utility costs was incurred, out of which 49% is attributed to electricity, 36% to natural gas, and 15% to water

Community Halls, Marinas, and Animal Services accounted for 0.9% of the City's total utility budget for 2018.

Figure 12-1: Utility Costs and Energy Use Breakdown for Community Halls, Marinas, and Animal Services



12.2.2 ENERGY USE INTENSITY

Energy Use Intensity (EUI) is a measurement that expresses a building's energy use as a function of its size or other characteristic. It is used to

give a better picture of the energy efficiency of a facility. The lower the EUI, the more efficient the facility is.

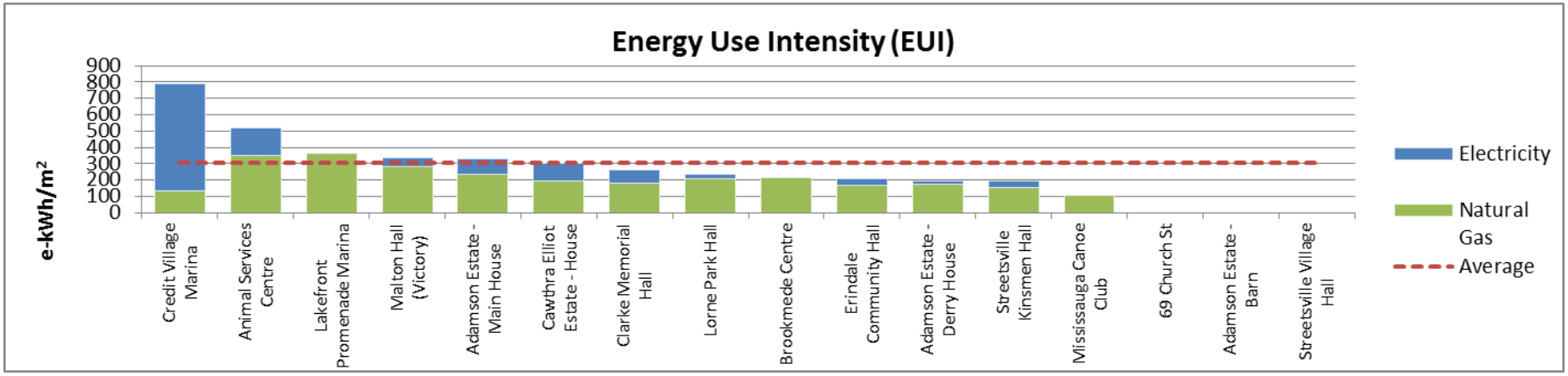
When reviewing EUI, the facility operation type and hours should be taken into account. For example, a facility that operates 24 hours a day will most likely have a higher EUI than a similar one that operates 8 hours a day. Similarly, a facility that has high energy using systems that do not contribute to the building area, such as an outdoor pool or outdoor ice rink, will have a higher EUI than a facility where those systems are located within the facility, as they would add to the facility's area footprint.

For **Community Halls, Marinas, and Animal Services** the average EUI in 2018 was 307.8 e-kWh/m2.

The following chart shows the EUI for each facility within **Community Halls, Marinas, and Animal Services**, and compares it to the average for the group.

Note: The Average EUI value is calculated by taking the total energy use of all facilities, and dividing by the total area of the facilities. As such, a larger facility would have a bigger impact on the average than a smaller facility.

Figure 12-2: Energy Use Intensity for Community Halls, Marinas, and Animal Services

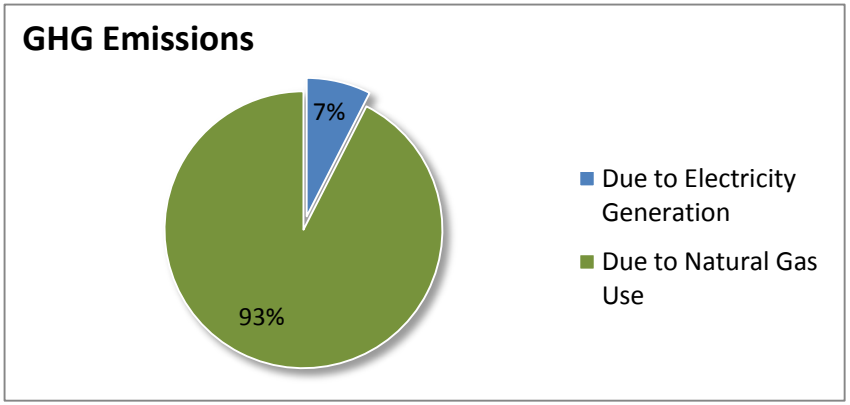


12.2.3 GREENHOUSE GAS (GHG) EMISSIONS

For 2018, **Community Halls, Marinas, and Animal Services** emitted 333,400 kg (or 333 tonnes) of CO2 in 2018. 7.5% of these emissions were due to the generation of electricity, while the use of natural gas accounted for the remaining 92.5%.

Community Halls, Marinas, and Animal Services accounted for 1.7% of the City's total GHG emissions for facilities included in the plan.

Figure 12-3: GHG Emissions Breakdown for Community Halls, Marinas, and Animal Services

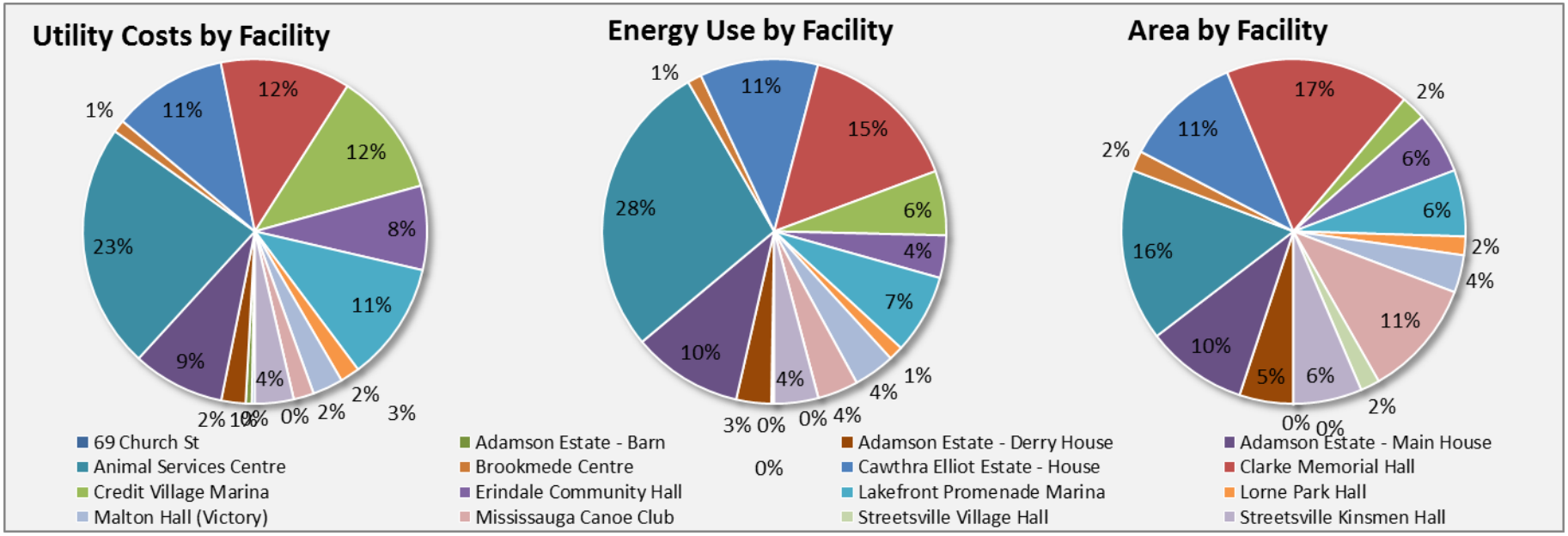


12.3 ENERGY AND GHG BREAKDOWN FOR COMMUNITY HALLS, MARINAS, AND ANIMAL SERVICES

This section provides a brief overview/recap of the Utility and GHG data for **Community Halls, Marinas, and Animal Services**. The table below summarizes, by facility, the utility usage and GHG emissions for 2018. Following are the key takeaways:

- Clarke Memorial Hall, Erindale Community Hall, Streetsville Kinsmen Hall, Malton Hall, Lorne Park Hall, Streetsville Village Hall, represent 37% of the floor area in the group and contribute 28% and 29% towards the energy consumption and utility consumption in the group
- The two estates: Adamson Estate and Cawthra Elliot Estate, represent 26% of the floor area in the group and contribute 24% and 22% towards the energy consumption and utility consumption in the group
- Animal Services Centre represents the second largest facility by area in this group and contributes 28% and 23% towards the energy consumption and utility consumption in the group

Figure 12-4: Utility Costs and Energy Use Breakdown by Facility



2018 Annual Report for Community Halls, Marinas, and Animal Services

Facility	Area	Electricity		Natural Gas		Total Energy	Water		Total Costs	GHG Emissions
	m^2	kWh	$	m^3	$	e-kWh	m^3	$	$	kg
69 Church St	0	2,631	$504	0	$0	**2,631**	0	$0	**$504**	95
Adamson Estate - Barn	0	3,888	$926	0	$0	**3,888**	0	$0	**$926**	140
Adamson Estate - Derry House	403	9,074	$1,136	6,657	$2,657	**78,968**	0	$0	**$3,793**	12,914
Adamson Estate - Main House	757	69,866	$8,067	17,128	$5,368	**249,708**	385	$941	**$14,376**	34,904
Animal Services Centre	1,283	214,567	$23,966	43,096	$11,814	**667,077**	1,021	$2,482	**$38,262**	89,219
Brookmede Centre	149	0	$0	3,047	$1,598	**31,994**	144	$351	**$1,949**	5,762
Cawthra Elliot Estate - House	877	97,613	$11,258	16,156	$5,083	**267,252**	627	$1,539	**$17,879**	34,065
Clarke Memorial Hall	1,383	114,632	$13,021	23,964	$7,085	**366,249**	64	$156	**$20,262**	49,442
Credit Village Marina	184	120,776	$13,035	2,359	$1,508	**145,540**	1,967	$4,854	**$19,397**	8,808
Erindale Community Hall	460	19,585	$2,607	7,266	$10,239	**95,880**	101	$244	**$13,090**	14,445
Lakefront Promenade Marina	495	0	$0	17,114	$5,453	**179,692**	5,324	$13,072	**$18,525**	32,362
Lorne Park Hall	139	3,881	$932	2,736	$1,614	**32,605**	198	$490	**$3,036**	5,313
Malton Hall (Victory)	279	14,210	$2,055	7,511	$2,330	**93,073**	144	$351	**$4,735**	14,714
Mississauga Canoe Club	875	0	$0	8,757	$2,855	**91,945**	133	$327	**$3,182**	16,559
Streetsville Village Hall	143	0	$0	0	$0	**0**	0	$0	**$0**	0

Streetsville Kinsmen Hall	511	22,573	$2,990	7,312	$2,716	**99,352**	108	$298	**$6,004**	14,640
Totals	7,938	693,295	$80,496	163,101	$60,319	**2,405,853**	10,214	$25,104	**$165,919**	333,382
Usage / Costs per m^2:		109.4	$12.6	20.9	$7.7	**308**	1.4	$3.4	**$21.1**	42.7

12.4 ACTION PLAN

An action plan has not been identified to save on electricity, natural gas, oil, and/or other form of energy consumption within this group since the group represent less than 1.0% of the City's utility budget.

12.5 ESTIMATED SAVINGS

At the end of the plan, **Community Halls, Marinas, and Animal Services** are not expected to save since no action plan has been identified for the group.

12.6 PROGRESS TO TARGETS

The City is not targeting reduction in energy use in **Community Halls, Marinas, and Animal Services** by 2023 over the base year, 2018. The reporting of energy consumption data and savings for **Community Halls, Marinas, and Animal Services** will be based on utility meters and assembled annually. Since utility meters monitor energy consumption for the entire facility, the measurement boundary will encompass all parts of the facility. To determine the savings and fairly compare year-to-year energy consumption data, it is important to account for independent variables such as weather and occupancy and apply regression analysis to consumption data. Therefore, actual consumption data for each year starting 2019 will be adjusted to match the weather and occupancy of 2018. The figures below show the updated progress for each year against the set target.

Figure 12-7: Annual Energy Use vs Targeted Energy Use for Community Halls, Marinas, and Animal Services

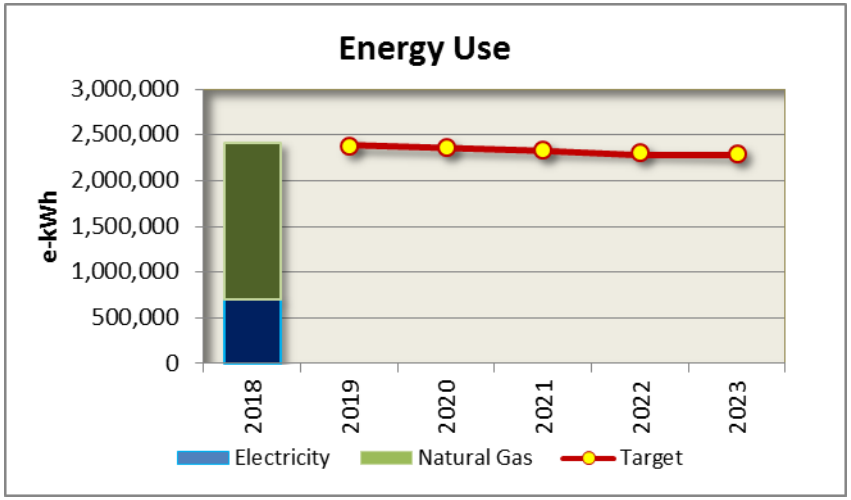
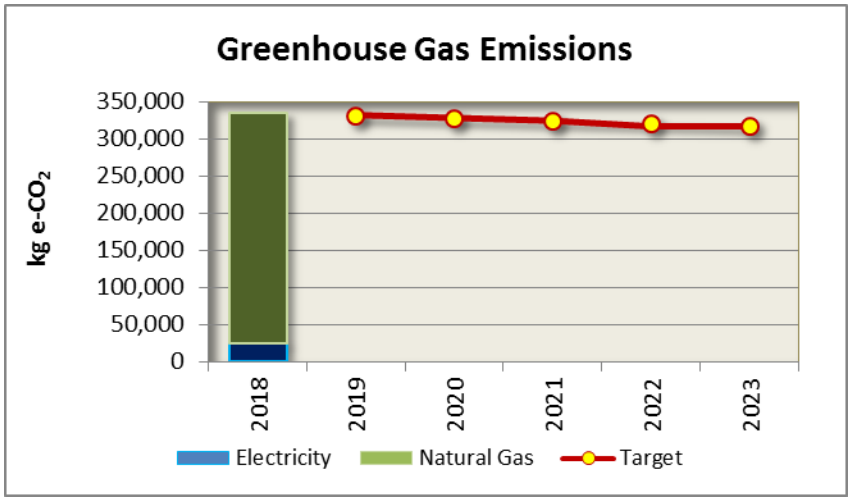


Figure 12-8: Annual GHG Emissions vs Targets for Community Halls, Marinas, and Animal Services



12.7 FACILITY INFORMATION FOR COMMUNITY HALLS, MARINAS, AND ANIMAL SERVICES

Facility: 69 Church St

Address 69 Church St.,

Area (m^2): Area (ft^2):

Year Built: Hours per Week :

Facility Group: Minor Centres/Halls

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	0	0	2,631
Electricity ($)	$0	$0	$504
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$0	$0	$504
Total e-kWh	0	0	2,631
Total e-kWh/m^2	N/A	N/A	N/A
GHG (kg/Yr)	0	0	95
GHG (kg/Yr/m^2)	*N/A*	*N/A*	*N/A*

Energy Measures

Facility: Adamson Estate - Barn

Address 850 Enola Avenue, L5G 4B2

Area (m^2): Area (ft^2):

Year Built: 1920 Hours per Week : 0

Facility Group: Minor Centres/Halls

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	3,866	4,092	3,888
Electricity ($)	$1,186	$1,095	$926
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$1,186	$1,095	$926
Total e-kWh	3,866	4,092	3,888
Total e-kWh/m^2	N/A	N/A	N/A
GHG (kg/Yr)	139	147	140
GHG (kg/Yr/m^2)	*N/A*	*N/A*	*N/A*

Energy Measures

Facility: Adamson Estate - Derry House

Address: 875 Enola Avenue, L5G 4R1

Area (m^2): 403 Area (ft^2): 4,435

Year Built: 1932 Hours per Week : 50

Facility Group: Minor Centres/Halls

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	4,951	8,312	9,074
Electricity ($)	$1,142	$1,258	$1,136
Natural Gas (m^3)	7,025	6,425	6,657
Natural Gas ($)	$2,641	$2,639	$2,657
Water (m^3)	498	262	0
Water ($)	$1,030	$562	$0
Total Costs ($)	$4,813	$4,458	$3,793
Total e-kWh	78,717	75,775	78,968
Total e-kWh/m^2	195.3	188.0	195.9
GHG (kg/Yr)	13,463	12,449	12,914
GHG (kg/Yr/m^2)	*33*	*31*	*32*

Energy Measures

Facility: Adamson Estate - Main House

Address: 850 Enola Ave, L5B 3C1

Area (m^2): 757 Area (ft^2): 8,816

Year Built: 1920 Hours per Week : 50

Facility Group: Minor Centres/Halls

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	74,231	71,056	69,866
Electricity ($)	$12,382	$10,586	$8,067
Natural Gas (m^3)	16,432	17,030	17,128
Natural Gas ($)	$4,586	$5,399	$5,368
Water (m^3)	1,049	906	385
Water ($)	$2,306	$2,085	$941
Total Costs ($)	$19,275	$18,070	$14,376
Total e-kWh	246,769	249,874	249,708
Total e-kWh/m^2	326.0	330.1	329.9
GHG (kg/Yr)	33,746	34,762	34,904
GHG (kg/Yr/m^2)	*45*	*46*	*46*

Energy Measures

Facility: Animal Services Centre

Address: 735 Central Parkway W, L5C 4H4

Area (m^2): 1,283 Area (ft^2): 13,810

Year Built: 1987 Hours per Week : 50

Facility Group: Minor Centres/Halls

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	199,619	232,364	214,567
Electricity ($)	$32,710	$32,237	$23,966
Natural Gas (m^3)	44,534	33,088	43,096
Natural Gas ($)	$12,144	$9,970	$11,814
Water (m^3)	1,357	1,193	1,021
Water ($)	$2,962	$2,722	$2,482
Total Costs ($)	$47,815	$44,929	$38,262
Total e-kWh	667,229	579,793	667,077
Total e-kWh/m^2	520.1	451.9	519.9
GHG (kg/Yr)	91,401	70,935	89,219
GHG (kg/Yr/m^2)	*71*	*55*	*70*

Energy Measures

Facility: Brookmede Centre

Address: 2250 Council Ring Road, L5L 1B7

Area (m^2): 149 Area (ft^2): 1,604

Year Built: 1973 Hours per Week : 84

Facility Group: Minor Centres/Halls

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	0	0	0
Electricity ($)	$0	$0	$0
Natural Gas (m^3)	2,481	2,513	3,047
Natural Gas ($)	$1,520	$1,584	$1,598
Water (m^3)	27	95	144
Water ($)	$137	$217	$351
Total Costs ($)	$1,657	$1,801	$1,949
Total e-kWh	26,045	26,386	31,994
Total e-kWh/m^2	174.8	177.1	214.7
GHG (kg/Yr)	4,691	4,752	5,762
GHG (kg/Yr/m^2)	*31*	*32*	*39*

Energy Measures

Facility: Cawthra Elliot Estate - House

Address: 1507 Cawthra Rd, L5G 4L1

Area (m^2): 877 Area (ft^2): 9,655

Year Built: 1926 Hours per Week : 70

Facility Group: Minor Centres/Halls

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	96,730	100,633	97,613
Electricity ($)	$15,962	$14,279	$11,258
Natural Gas (m^3)	14,935	15,542	16,156
Natural Gas ($)	$4,691	$5,011	$5,083
Water (m^3)	1,335	948	627
Water ($)	$2,983	$2,182	$1,539
Total Costs ($)	$23,636	$21,471	$17,879
Total e-kWh	253,547	263,825	267,252
Total e-kWh/m^2	289.1	300.8	304.7
GHG (kg/Yr)	31,724	33,013	34,065
GHG (kg/Yr/m^2)	*36*	*38*	*39*

Energy Measures

Facility: Clarke Memorial Hall

Address: 161 Lakeshore Rd W, L5H 1G3

Area (m^2): 1,383 Area (ft^2): 14,886

Year Built: 1921 Hours per Week : 72

Facility Group: Minor Centres/Halls

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	142,509	119,068	114,632
Electricity ($)	$23,475	$17,026	$13,021
Natural Gas (m^3)	16,622	21,520	23,964
Natural Gas ($)	$5,061	$6,684	$7,085
Water (m^3)	193	1,044	64
Water ($)	$408	$2,383	$156
Total Costs ($)	$28,943	$26,093	$20,262
Total e-kWh	317,039	345,025	366,249
Total e-kWh/m^2	229.2	249.5	264.8
GHG (kg/Yr)	36,562	44,980	49,442
GHG (kg/Yr/m^2)	*26*	*33*	*36*

Energy Measures

Facility: Credit Village Marina

Address: 12 Stavebank Rd S, L5G 2T1

Area (m^2): 184 Area (ft^2): 1,981

Year Built: 1998 Hours per Week : 70

Facility Group: Minor Centres/Halls

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	117,380	135,397	120,776
Electricity ($)	$17,775	$16,500	$13,035
Natural Gas (m^3)	3,572	3,463	2,359
Natural Gas ($)	$1,561	$1,924	$1,508
Water (m^3)	2,299	1,929	1,967
Water ($)	$5,054	$4,453	$4,854
Total Costs ($)	$24,390	$22,876	$19,397
Total e-kWh	154,884	171,760	145,540
Total e-kWh/m^2	841.8	933.5	791.0
GHG (kg/Yr)	10,980	11,423	8,808
GHG (kg/Yr/m^2)	*60*	*62*	*48*

Energy Measures

Facility: Erindale Community Hall

Address: 1620 Dundas St. W, L5C 1E6

Area (m^2): 460 Area (ft^2): 4,951

Year Built: 0 Hours per Week : 72

Facility Group: Minor Centres/Halls

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	18,155	18,805	19,585
Electricity ($)	$3,408	$2,836	$2,607
Natural Gas (m^3)	7,536	7,036	7,266
Natural Gas ($)	$2,791	$2,796	$10,239
Water (m^3)	76	143	101
Water ($)	$165	$328	$244
Total Costs ($)	$6,364	$5,960	$13,090
Total e-kWh	97,284	92,683	95,880
Total e-kWh/m^2	211.5	201.5	208.4
GHG (kg/Yr)	14,904	13,982	14,445
GHG (kg/Yr/m^2)	*32*	*30*	*31*

Energy Measures

Facility: Lakefront Promenade Marina

Address: 135 Lakefront Promenade, L5E 3G6

Area (m^2): 495 Area (ft^2): 5,328

Year Built: 1991 Hours per Week : 70

Facility Group: Minor Centres/Halls

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	0	0	0
Electricity ($)	$0	$0	$0
Natural Gas (m^3)	14,712	15,935	17,114
Natural Gas ($)	$8,358	$7,904	$5,453
Water (m^3)	2,432	3,386	5,324
Water ($)	$5,369	$7,794	$13,072
Total Costs ($)	$13,727	$15,698	$18,525
Total e-kWh	154,477	167,322	179,692
Total e-kWh/m^2	312.1	338.0	363.0
GHG (kg/Yr)	27,821	30,134	32,362
GHG (kg/Yr/m^2)	*56*	*61*	*65*

Energy Measures

Facility: Lorne Park Hall

Address: 1288 Lorne Park Road, L5H 3B1

Area (m^2): 139 Area (ft^2): 1,496

Year Built: 1940 Hours per Week : 72

Facility Group: Minor Centres/Halls

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	1,279	2,370	3,881
Electricity ($)	$736	$851	$932
Natural Gas (m^3)	2,763	2,815	2,736
Natural Gas ($)	$1,594	$1,678	$1,614
Water (m^3)	225	180	198
Water ($)	$498	$415	$490
Total Costs ($)	$2,828	$2,944	$3,036
Total e-kWh	30,290	31,925	32,605
Total e-kWh/m^2	217.9	229.7	234.6
GHG (kg/Yr)	5,271	5,408	5,313
GHG (kg/Yr/m^2)	*38*	*39*	*38*

Energy Measures

Facility: Malton Hall (Victory)

Address: 3091 Victory Cres, L4T 1L5

Area (m^2): 279 Area (ft^2): 3,003

Year Built: 1940 Hours per Week : 72

Facility Group: Minor Centres/Halls

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	13,363	12,145	14,210
Electricity ($)	$2,643	$1,980	$2,055
Natural Gas (m^3)	7,181	7,748	7,511
Natural Gas ($)	$2,131	$2,332	$2,330
Water (m^3)	137	85	144
Water ($)	$294	$194	$351
Total Costs ($)	$5,067	$4,505	$4,735
Total e-kWh	88,766	93,502	93,073
Total e-kWh/m^2	318.2	335.1	333.6
GHG (kg/Yr)	14,061	15,089	14,714
GHG (kg/Yr/m^2)	*50*	*54*	*53*

Energy Measures

Facility: Mississauga Canoe Club

Address: 33 Front St N, L5H 2E1

Area (m^2): 875 Area (ft^2): 9,418

Year Built: 1950 Hours per Week : 70

Facility Group: Minor Centres/Halls

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	0	0	0
Electricity ($)	$0	$0	$0
Natural Gas (m^3)	11,314	12,459	8,757
Natural Gas ($)	$3,866	$4,238	$2,855
Water (m^3)	10	150	133
Water ($)	$21	$344	$327
Total Costs ($)	$3,887	$4,582	$3,182
Total e-kWh	118,800	130,818	91,945
Total e-kWh/m^2	135.8	149.5	105.1
GHG (kg/Yr)	21,395	23,560	16,559
GHG (kg/Yr/m^2)	*24*	*27*	*19*

Energy Measures

Facility: Streetsville Village Hall

Address: 280 Queen St S, L5M 1M1

Area (m^2): 143 Area (ft^2): 1,539

Year Built: 1860 Hours per Week : 72

Facility Group: Minor Centres/Halls

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	0	0	0
Electricity ($)	$0	$0	$0
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$0	$0	$0
Total e-kWh	0	0	0
Total e-kWh/m^2	0.0	0.0	0.0
GHG (kg/Yr)	0	0	0
GHG (kg/Yr/m^2)	*0*	*0*	*0*

Energy Measures

Facility:	Streetsville Kinsmen Hall		
Address	327 Queen St S, L5M 1M3		
Area (m^2):	511	Area (ft^2):	5,500
Year Built:		Hours per Week :	
Facility Group:	Minor Centres/Halls		
Building Components:			

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	0	0	22,573
Electricity ($)	$0	$0	$2,990
Natural Gas (m^3)	0	0	7,312
Natural Gas ($)	$0	$0	$2,716
Water (m^3)	0	0	108
Water ($)	$0	$0	$298
Total Costs ($)	$0	$0	$6,004
Total e-kWh	0	0	99,352
Total e-kWh/m^2	0.0	0.0	194.4
GHG (kg/Yr)	0	0	14,640
GHG (kg/Yr/m^2)	*0*	*0*	*29*

Energy Measures

13.0 OUTDOOR POOL BUILDINGS

13.1 SCOPE AND BOUNDARY

For the purposes of this report, the City of Mississauga has 7 facilities/locations that fall under this category. They include:

- Applewood Heights - Outdoor Pool
- David Ramsey - Outdoor Pool
- Don McLean Westacres - Outdoor Pool
- Ron Lenyk Springfield Park - Erindale Outdoor Pool
- Lewis Bradley Park - Outdoor Pool
- Lions Club of Credit Valley Pool Building
- Streetsville - Outdoor Pool

The above listed locations have a total floor area of approximately 2,500 square meters. This would account for 0.5% of the total building area for City of Mississauga facilities included in this Plan.

13.2 BASELINE

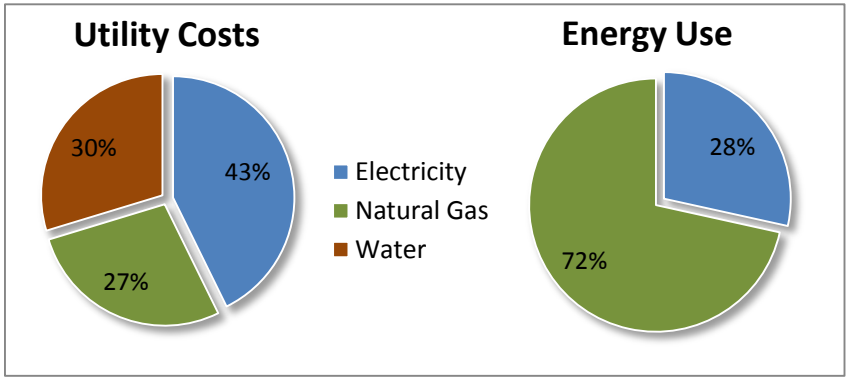
13.2.1 ENERGY USE

The energy use (combined electricity and natural gas) for **Outdoor Pool Buildings** was 1,896,000 equivalent kilowatt hours in 2018. Following are the key takeaways for the energy usage in 2018:

- 28% of the total energy usage was due to electricity use, which has increased by 17.6% since 2013
- 72% of the total energy usage was due to natural gas use, which has dropped by 3.5% since 2013
- A total of $143,000 in utility costs was incurred, out of which 43% is attributed to electricity, 27% to natural gas, and 30% to water

Outdoor Pool Buildings accounted for 0.8% of the City's total utility budget for 2018.

Figure 13-1: Utility Costs and Energy Use Breakdown for Outdoor Pool Buildings



13.2.2 ENERGY USE INTENSITY

Energy Use Intensity (EUI) is a measurement that expresses a building's energy use as a function of its size or other characteristic. It is used to give a better picture of the energy efficiency of a facility. The lower the EUI, the more efficient the facility is.

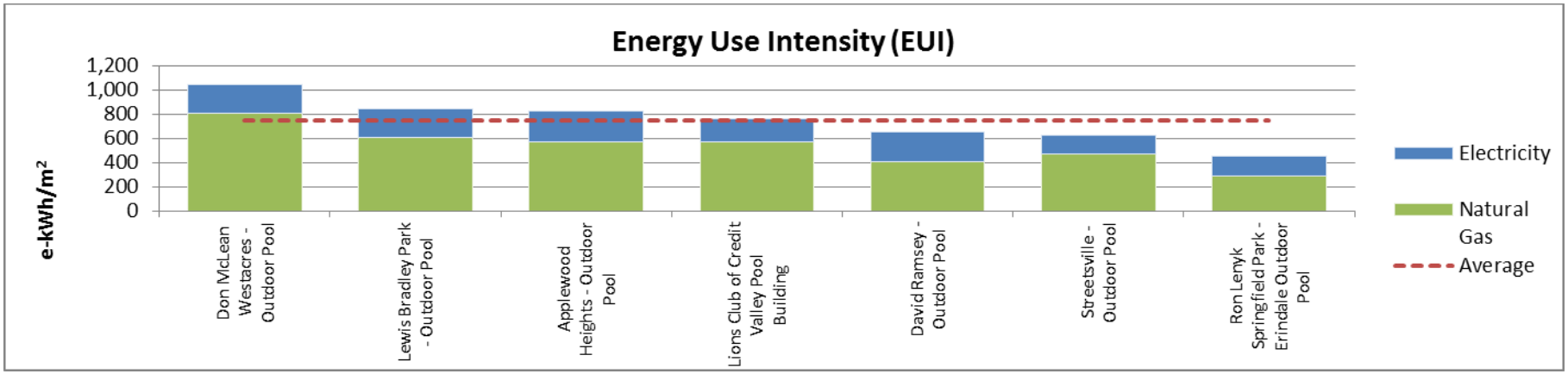
When reviewing EUI, the facility operation type and hours should be taken into account. For example, a facility that operates 24 hours a day will most likely have a higher EUI than a similar one that operates 8 hours a day. Similarly, a facility that has high energy using systems that do not contribute to the building area, such as an outdoor pool or outdoor ice rink, will have a higher EUI than a facility where those systems are located within the facility, as they would add to the facility's area footprint.

For **Outdoor Pool Buildings** the average EUI in 2018 was 744.1 e-kWh/m2.

The following chart shows the EUI for each facility within **Outdoor Pool Buildings**, and compares it to the average for the group.

Note: The Average EUI value is calculated by taking the total energy use of all facilities, and dividing by the total area of the facilities. As such, a larger facility would have a bigger impact on the average than a smaller facility.

Figure 13-2: Energy Use Intensity for Outdoor Pool Buildings

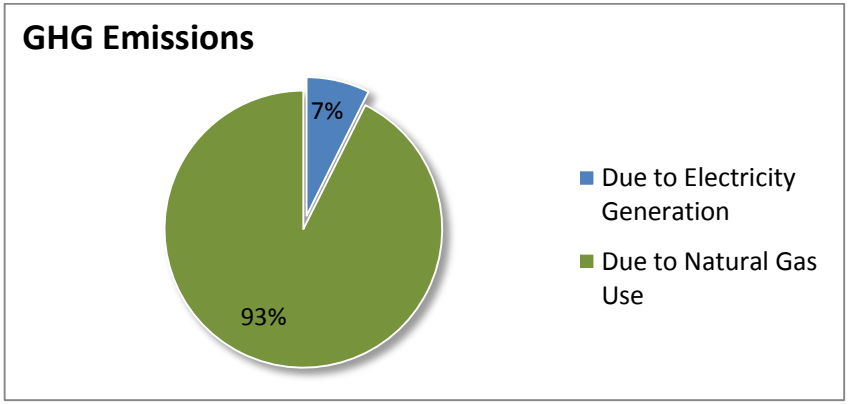


13.2.3 GREENHOUSE GAS (GHG) EMISSIONS

For 2018, **Outdoor Pool Buildings** emitted 263,700 kg (or 264 tonnes) of CO2 in 2018. 7.4% of these emissions were due to the generation of electricity, while the use of natural gas accounted for the remaining 92.6%.

Outdoor Pool Buildings accounted for 1.3% of the City's total GHG emissions for facilities included in the plan.

Figure 13-3: GHG Emissions Breakdown for Outdoor Pool Buildings

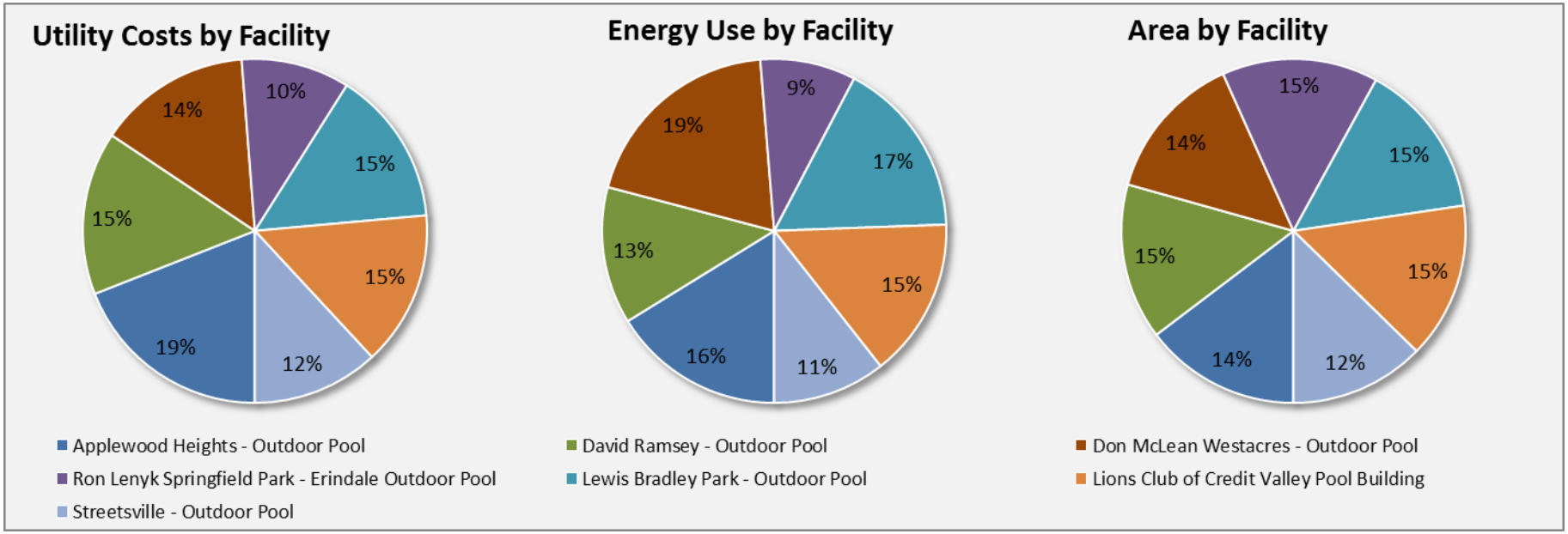


13.3 ENERGY AND GHG BREAKDOWN FOR OUTDOOR POOL BUILDINGS

This section provides a brief overview/recap of the Utility and GHG data for **Outdoor Pool Buildings**. The table below summarizes, by facility, the utility usage and GHG emissions for 2018. Following are the key takeaways:

- The seven (7) outdoor pool buildings represent the same floor area in the group, with Don McLean Westacres Outdoor Pool consuming the most energy due to the higher number of bathers experienced at the facility

Figure 12-4: Utility Costs and Energy Use Breakdown by Facility



2018 Annual Report for Outdoor Pool Buildings

Facility	Area	Electricity		Natural Gas		Total Energy	Water		Total Costs	GHG Emissions
	m^2	kWh	$	m^3	$	e-kWh	m^3	$	$	kg
Applewood Heights - Outdoor Pool	374	92,778	$10,307	20,434	$5,615	**307,332**	4,549	$11,235	**$27,157**	41,980
David Ramsey - Outdoor Pool	374	92,123	$10,381	14,508	$4,492	**244,452**	2,895	$7,016	**$21,889**	30,750
Don McLean Westacres - Outdoor Pool	355	84,826	$9,574	27,314	$7,976	**371,627**	1,209	$2,984	**$20,533**	54,705
Ron Lenyk Springfield Park - Erindale Outdoor Pool	374	60,992	$7,004	10,418	$3,696	**170,376**	1,560	$3,853	**$14,553**	21,895
Lewis Bradley Park - Outdoor Pool	374	89,685	$10,011	21,664	$6,492	**317,155**	1,750	$4,323	**$20,825**	44,195
Lions Club of Credit Valley Pool Building	374	71,095	$8,073	20,263	$6,338	**283,857**	2,565	$6,336	**$20,746**	40,877
Streetsville - Outdoor Pool	323	47,975	$5,619	14,582	$4,729	**201,087**	2,685	$6,631	**$16,979**	29,302
Totals	2,548	539,474	$60,967	129,182	$39,336	**1,895,886**	17,214	$42,378	**$142,681**	263,704
Usage / Costs per m^2:		211.7	$23.9	50.7	$15.4	**744**	6.8	$16.6	**$56.0**	103.5

13.4 ACTION PLAN

An action plan has not been identified to save on electricity, natural gas, oil, and/or other form of energy consumption within this group since the group represent less than 1.0% of the City's utility budget.

13.5 ESTIMATED SAVINGS

At the end of the plan, **Outdoor Pool Buildings** are not expected to save since no action plan has been identified for the group.

13.6 PROGRESS TO TARGETS

The City is not targeting reduction in energy use in **Outdoor Pool Buildings** by 2023 over the base year, 2018. The reporting of energy consumption data and savings for **Outdoor Pool Buildings** will be based on utility meters and assembled annually. Since utility meters monitor energy consumption for the entire facility, the measurement boundary will encompass all parts of the facility. To determine the savings and fairly compare year-to-year energy consumption data, it is important to account for independent variables such as weather and occupancy and apply regression analysis to consumption data. Therefore, actual consumption data for each year starting 2019 will be adjusted to match the weather and occupancy of 2018. The figures below show the updated progress for each year against the set target.

Figure 12-7: Annual Energy Use vs Targeted Energy Use for Outdoor Pool Buildings

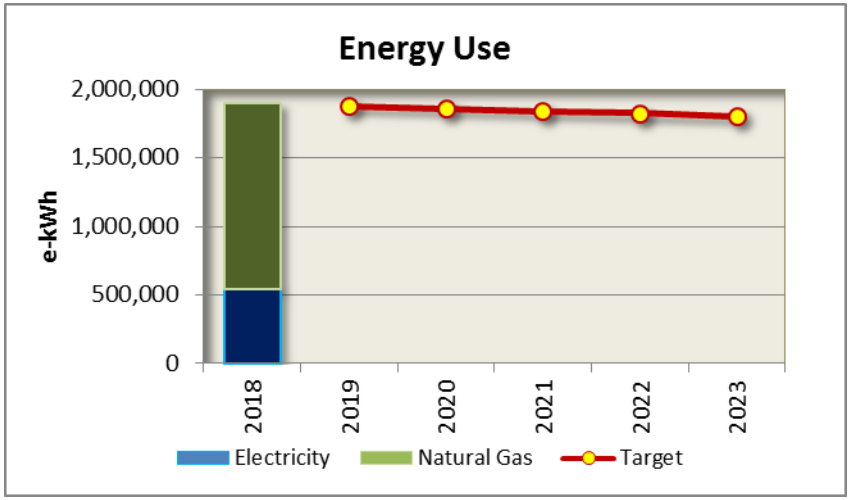
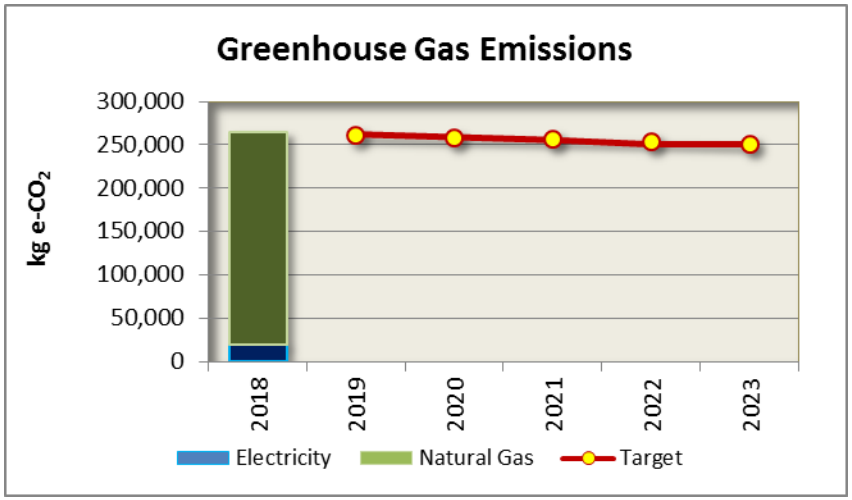


Figure 12-8: Annual GHG Emissions vs Targets for Outdoor Pool Buildings



Facility: Applewood Heights - Outdoor Pool

Address: 3119 Constitution Blvd, L4Y 2Z1

Area (m^2): 374 Area (ft^2): 4,026

Year Built: 1976 Hours per Week : 70

Facility Group: Outdoor Pool Building

Building Components: Pool (Outdoor)

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	78,672	115,034	92,778
Electricity ($)	$12,969	$11,951	$10,307
Natural Gas (m^3)	19,235	19,358	20,434
Natural Gas ($)	$5,654	$6,429	$5,615
Water (m^3)	5,858	3,985	4,549
Water ($)	$12,943	$9,198	$11,235
Total Costs ($)	$31,566	$27,577	$27,157
Total e-kWh	280,635	318,290	307,332
Total e-kWh/m^2	750.4	851.0	821.7
GHG (kg/Yr)	39,205	40,747	41,980
GHG (kg/Yr/m^2)	*105*	*109*	*112*

Energy Measures

Facility: David Ramsey - Outdoor Pool

Address	2470 Thorn Lodge Dr, L5K 1K5		
Area (m^2):	374	Area (ft^2):	4,026
Year Built:	1976	Hours per Week :	100
Facility Group:	Outdoor Pool Building		
Building Components:	Pool (Outdoor)		

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	68,287	97,285	92,123
Electricity ($)	$11,489	$10,116	$10,381
Natural Gas (m^3)	21,795	28,187	14,508
Natural Gas ($)	$5,883	$9,002	$4,492
Water (m^3)	4,174	2,319	2,895
Water ($)	$9,122	$5,299	$7,016
Total Costs ($)	$26,493	$24,417	$21,889
Total e-kWh	297,130	393,245	244,452
Total e-kWh/m^2	794.5	1,051.5	653.6
GHG (kg/Yr)	43,672	56,803	30,750
GHG (kg/Yr/m^2)	*117*	*152*	*82*

Energy Measures

Facility: Don McLean Westacres - Outdoor Pool

Address: 2166 Westfield Dr, L4Y 1P7

Area (m^2): 355 Area (ft^2): 3,821

Year Built: 1962 Hours per Week : 100

Facility Group: Outdoor Pool Building

Building Components: Pool (Outdoor)

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	78,591	103,797	84,826
Electricity ($)	$13,179	$11,106	$9,574
Natural Gas (m^3)	13,546	6,425	27,314
Natural Gas ($)	$4,537	$2,835	$7,976
Water (m^3)	1,295	1,436	1,209
Water ($)	$2,865	$3,310	$2,984
Total Costs ($)	$20,581	$17,251	$20,533
Total e-kWh	220,822	171,263	371,627
Total e-kWh/m^2	622.0	482.4	1,046.8
GHG (kg/Yr)	28,444	15,887	54,705
GHG (kg/Yr/m^2)	*80*	*45*	*154*

Energy Measures

Facility: Ron Lenyk Springfield Park - Erindale Outdoor Pool

Address: 1244 Shamir Cres., L5C 1L1

Area (m^2): 374 Area (ft^2): 4,026

Year Built: 1962 Hours per Week : 100

Facility Group: Outdoor Pool Building

Building Components: Pool (Outdoor)

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	53,372	81,112	60,992
Electricity ($)	$9,358	$7,855	$7,004
Natural Gas (m^3)	13,955	19,522	10,418
Natural Gas ($)	$4,877	$6,412	$3,696
Water (m^3)	2,430	1,970	1,560
Water ($)	$5,375	$4,523	$3,853
Total Costs ($)	$19,610	$18,789	$14,553
Total e-kWh	199,897	286,093	170,376
Total e-kWh/m^2	534.5	765.0	455.5
GHG (kg/Yr)	28,310	39,836	21,895
GHG (kg/Yr/m^2)	*76*	*107*	*59*

Energy Measures

Facility: Lewis Bradley Park - Outdoor Pool

Address: 745 Inverhouse Road, L5J 4N9

Area (m^2): 374 Area (ft^2): 4,026

Year Built: 1976 Hours per Week : 100

Facility Group: Outdoor Pool Building

Building Components: Pool (Outdoor)

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	78,924	106,099	89,685
Electricity ($)	$13,051	$11,180	$10,011
Natural Gas (m^3)	18,551	17,185	21,664
Natural Gas ($)	$5,789	$5,425	$6,492
Water (m^3)	3,710	2,360	1,750
Water ($)	$8,652	$5,448	$4,323
Total Costs ($)	$27,492	$22,053	$20,825
Total e-kWh	273,706	286,546	317,155
Total e-kWh/m^2	731.8	766.2	848.0
GHG (kg/Yr)	37,921	36,317	44,195
GHG (kg/Yr/m^2)	*101*	*97*	*118*

Energy Measures

Facility: Lions Club of Credit Valley Pool Building

Address: 20 Rosewood Ave, L5G 3H9

Area (m^2): 374 Area (ft^2): 4,026

Year Built: 1953 Hours per Week : 100

Facility Group: Outdoor Pool Building

Building Components: Pool (Outdoor)

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	74,500	103,808	71,095
Electricity ($)	$12,599	$10,302	$8,073
Natural Gas (m^3)	22,527	25,069	20,263
Natural Gas ($)	$7,402	$8,186	$6,338
Water (m^3)	3,477	2,520	2,565
Water ($)	$7,691	$5,818	$6,336
Total Costs ($)	$27,693	$24,305	$20,746
Total e-kWh	311,031	367,033	283,857
Total e-kWh/m^2	831.6	981.4	759.0
GHG (kg/Yr)	45,280	51,143	40,877
GHG (kg/Yr/m^2)	*121*	*137*	*109*

Energy Measures

Facility: Streetsville - Outdoor Pool

Address: 335 Church St, L5M 2C2

Area (m^2): 323 Area (ft^2): 3,477

Year Built: 1966 Hours per Week : 100

Facility Group: Outdoor Pool Building

Building Components: Pool (Outdoor)

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	52,360	65,148	47,975
Electricity ($)	$9,821	$7,145	$5,619
Natural Gas (m^3)	15,943	22,168	14,582
Natural Gas ($)	$5,549	$6,730	$4,729
Water (m^3)	2,384	2,240	2,685
Water ($)	$5,118	$5,244	$6,631
Total Costs ($)	$20,488	$19,119	$16,979
Total e-kWh	219,757	297,915	201,087
Total e-kWh/m^2	680.4	922.3	622.6
GHG (kg/Yr)	32,032	44,266	29,302
GHG (kg/Yr/m^2)	*99*	*137*	*91*

Energy Measures

14.0 PARKS AND SPORTS FIELDS

14.1 SCOPE AND BOUNDARY

For the purposes of this report, the City of Mississauga has 242 facilities/locations that fall under this category. The group has a total floor area of approximately 13,500 square meters. This would account for 2.9% of the total building area for City of Mississauga facilities included in this Plan.

14.2 BASELINE

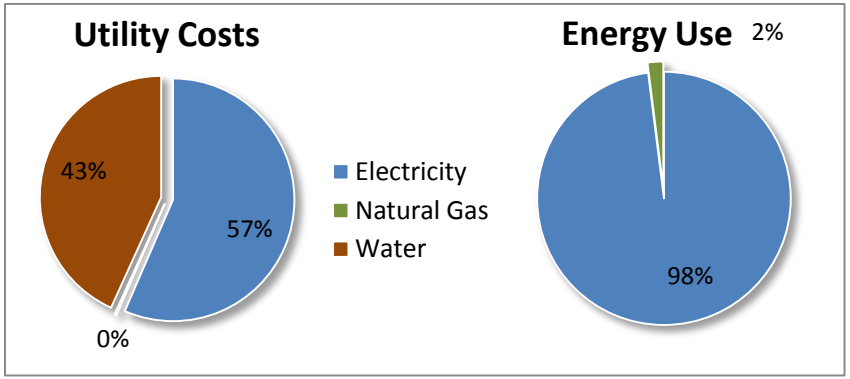
14.2.1 ENERGY USE

The energy use (combined electricity and natural gas) for **Parks and Sports Fields** was 5,959,000 equivalent kilowatt hours in 2018. Following are the key takeaways for the energy usage in 2018:

- 98% of the total energy usage was due to electricity use
- 2% of the total energy usage was due to natural gas use
- A total of $1,593,000 in utility costs was incurred, out of which 57% is attributed to electricity and 43% to water

Parks and Sports Fields accounted for 8.9% of the City's total utility budget for 2018.

Figure 14-1: Utility Costs and Energy Use Breakdown for Parks and Sports Fields



14.2.2 ENERGY USE INTENSITY

Energy Use Intensity (EUI) is a measurement that expresses a building's energy use as a function of its size or other characteristic. It is used to give a better picture of the energy efficiency of a facility. The lower the EUI, the more efficient the facility is.

When reviewing EUI, the facility operation type and hours should be taken into account. For example, a facility that operates 24 hours a day will most likely have a higher EUI than a similar one that operates 8 hours a day. Similarly, a facility that has high energy using systems that do not contribute to the building area, such as an outdoor pool or outdoor ice rink, will have a higher EUI than a facility where those systems are located within the facility, as they would add to the facility's area footprint.

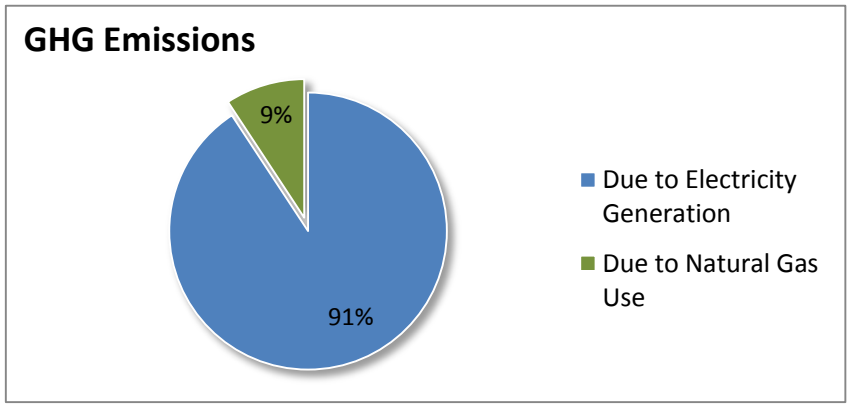
For **Parks and Sports Fields** the average EUI in 2018 was 37.5 e-kWh/m2.

14.2.3 GREENHOUSE GAS (GHG) EMISSIONS

For 2018, **Parks and Sports Fields** emitted 231,700 kg (or 232 tonnes) of CO2 in 2018. 90.7% of these emissions were due to the generation of electricity, while the use of natural gas accounted for the remaining 9.3%.

Parks and Sports Fields accounted for 1.2% of the City's total GHG emissions for facilities included in the plan.

Figure 14-2: GHG Emissions Breakdown for Parks and Sports Fields

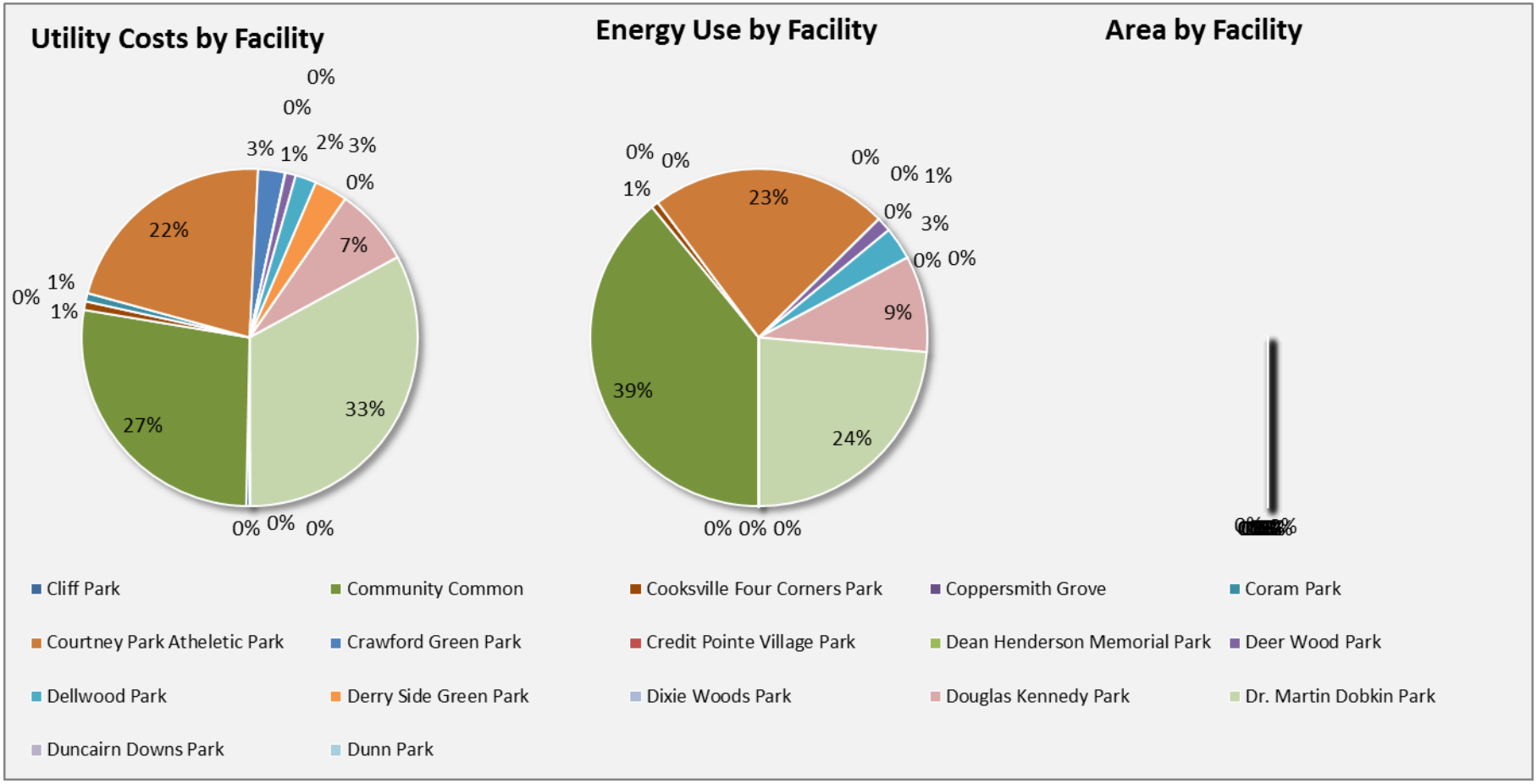


14.3 ENERGY AND GHG BREAKDOWN FOR PARKS AND SPORTS FIELDS

This section provides a brief overview/recap of the Utility and GHG data for **Parks and Sports Fields**. The table below summarizes, by facility, the utility usage and GHG emissions for 2018. Following are the key takeaways:

- Community Common, Dr. Martin Dobkin Park, Courtney Park Athletic Park, and Douglas Kennedy Park are the largest energy and utility consumers in the group due to the presence of both sports field lighting and change room enclosures

Figure 12-4: Utility Costs and Energy Use Breakdown by Facility



2018 Annual Report for Parks and Sports Fields

Facility	Area	Electricity		Natural Gas		Total Energy	Water		Total Costs	GHG Emissions
	m^2	kWh	$	m^3	$	e-kWh	m^3	$	$	kg
Cliff Park	0	0	$0	0	$0	**0**	0	$352	**$352**	0
Community Common	0	98,247	$11,439	6,869	$2,310	**170,375**	6,462	$15,915	**$29,664**	16,527
Cooksville Four Corners Park	0	3,067	$816	0	$0	**3,067**	64	$89	**$905**	110
Coppersmith Grove	0	0	$0	0	$0	**0**	0	$0	**$0**	0
Coram Park	0	0	$512	0	$0	**0**	0	$352	**$864**	0
Courtney Park Atheletic Park	0	99,645	$15,501	0	$0	**99,645**	5,466	$7,915	**$23,416**	3,587
Crawford Green Park	0	0	$0	0	$0	**0**	1,926	$2,791	**$2,791**	0
Credit Pointe Village Park	0	0	$0	0	$0	**0**	21	$50	**$50**	0
Dean Henderson Memorial Park	0	0	$0	0	$0	**0**	0	$0	**$0**	0
Deer Wood Park	0	6,029	$1,074	0	$0	**6,029**	5	$7	**$1,081**	217
Dellwood Park	0	13,709	$1,834	0	$0	**13,709**	0	$352	**$2,186**	494
Derry Side Green Park	0	0	$0	0	$0	**0**	2,398	$3,474	**$3,474**	0
Dixie Woods Park	0	0	$0	0	$0	**0**	0	$0	**$0**	0
Douglas Kennedy Park	0	40,271	$8,107	0	$0	**40,271**	0	$0	**$8,107**	1,450
Dr. Martin Dobkin Park	0	103,006	$25,844	0	$0	**103,006**	6,867	$9,903	**$35,747**	3,708
Duncairn Downs Park	0	0	$0	0	$0	**0**	0	$0	**$0**	0
Dunn Park	0	0	$0	0	$0	**0**	10	$15	**$15**	0

15.0 TRAFFIC AND STREET LIGHTING

15.1 SCOPE AND BOUNDARY

For the purposes of this report, the City of Mississauga has 7 facilities/locations that fall under this category. They include:

- Bus Shelters
- Decorative Bridge Lighting
- Gateway Lighting Feature
- Street Lighting
- Street Lighting - LED
- Traffic Bollards
- Traffic Signals

The above listed locations have a total floor area of approximately 0 square meters. This would account for 0.0% of the total building area for City of Mississauga facilities included in this Plan.

15.2 BASELINE

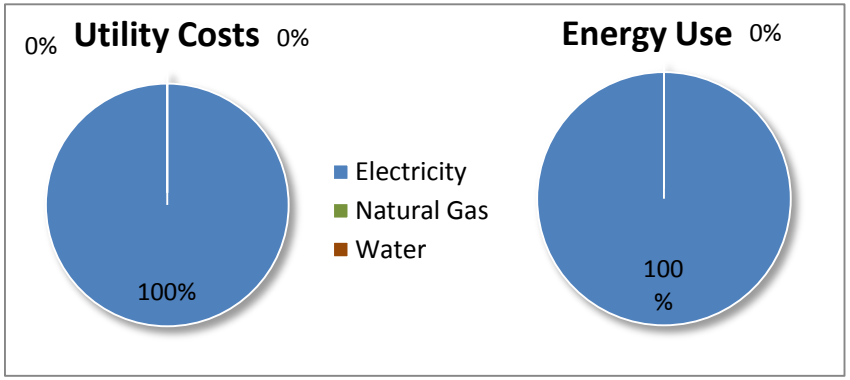
15.2.1 ENERGY USE

The energy use (combined electricity and natural gas) for **Traffic and Street Lighting** was 17,388,000 equivalent kilowatt hours in 2018. Following are the key takeaways for the energy usage in 2018:

- 100% of the total energy usage was due to electricity use
- A total of $2,855,000 in utility costs was incurred, out of which 100% is attributed to electricity

Traffic and Street Lighting accounted for 15.9% of the City's total utility budget for 2018.

Figure 15-1: Utility Costs and Energy Use Breakdown for Traffic and Street Lighting

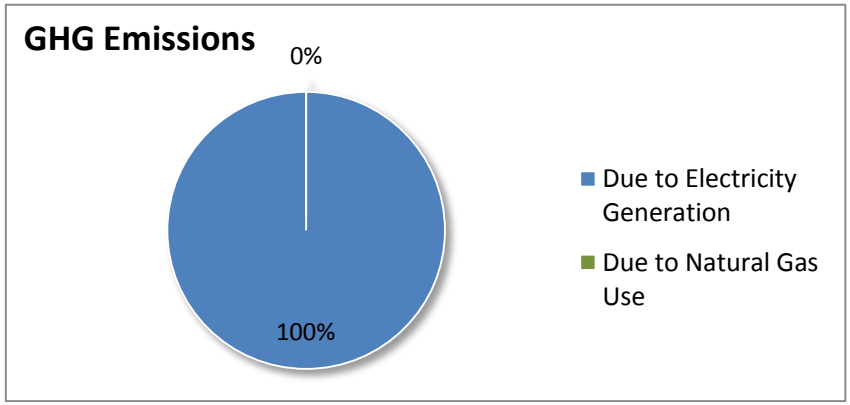


15.2.2 GREENHOUSE GAS (GHG) EMISSIONS

For 2018, **Traffic and Street Lighting** emitted 626,000 kg (or 626 tonnes) of CO2 in 2018. 100.0% of these emissions were due to the generation of electricity, while the use of natural gas accounted for the remaining 0.0%.

Traffic and Street Lighting accounted for 3.2% of the City's total GHG emissions for facilities included in the plan.

Figure 15-2: GHG Emissions Breakdown for Traffic and Street Lighting

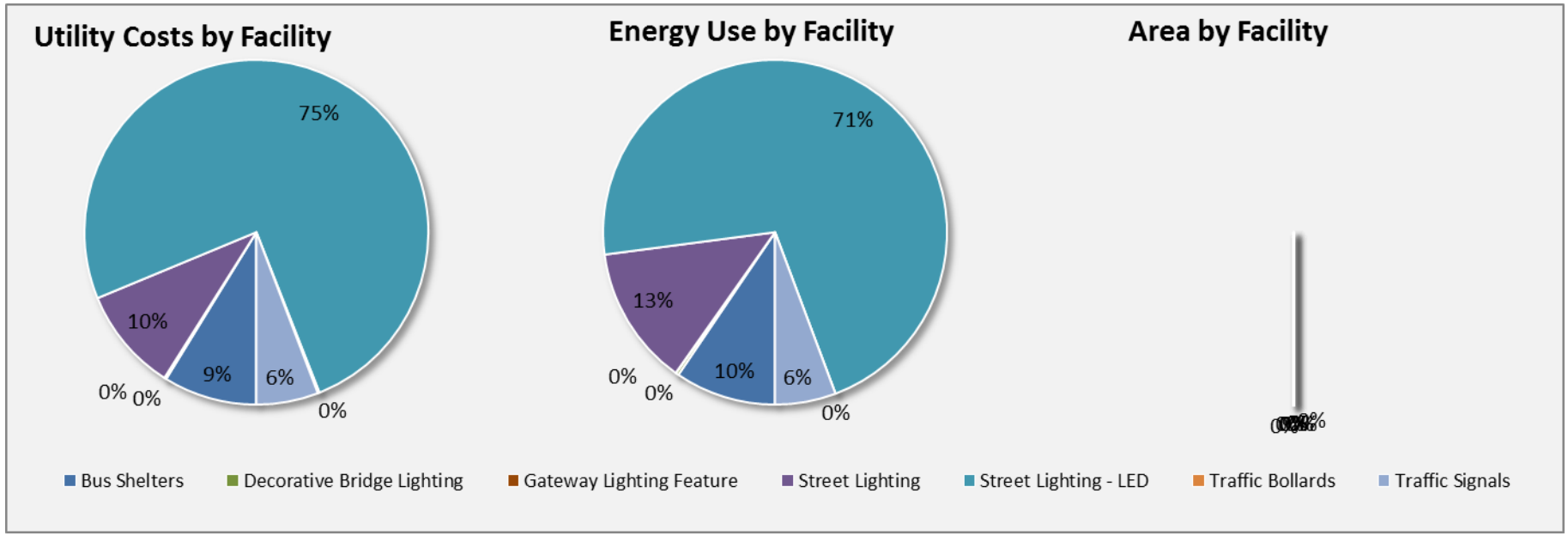


15.3 ENERGY AND GHG BREAKDOWN FOR TRAFFIC AND STREET LIGHTING

This section provides a brief overview/recap of the Utility and GHG data for **Traffic and Street Lighting**. The table below summarizes, by facility, the utility usage and GHG emissions for 2018. Following are the key takeaways:

- Street Lighting is the largest energy and utility consumer in the group, with the bus shelters and traffic signals as the next largest energy and utility consumers in the group

Figure 12-4: Utility Costs and Energy Use Breakdown by Facility



2018 Annual Report for Traffic and Street Lighting

Facility	Area	Electricity		Natural Gas		Total Energy	Water		Total Costs	GHG Emissions
	m^2	kWh	$	m^3	$	e-kWh	m^3	$	$	kg
Bus Shelters	0	1,653,815	$251,072	0	$0	**1,653,815**	0	$0	**$251,072**	59,537
Decorative Bridge Lighting	0	47,739	$5,024	0	$0	**47,739**	0	$0	**$5,024**	1,719
Gateway Lighting Feature	0	3,679	$496	0	$0	**3,679**	0	$0	**$496**	132
Street Lighting	0	2,282,474	$279,016	0	$0	**2,282,474**	0	$0	**$279,016**	82,169
Street Lighting - LED	0	12,406,722	$2,148,774	0	$0	**12,406,722**	0	$0	**$2,148,774**	446,642
Traffic Bollards	0	1,117	$4,763	0	$0	**1,117**	0	$0	**$4,763**	40
Traffic Signals	0	992,903	$165,990	0	$0	**992,903**	0	$0	**$165,990**	35,745
Totals	0	17,388,450	$2,855,134	0	$0	**17,388,450**	0	$0	**$2,855,134**	625,984
Usage / Costs per m^2:		-	-	-	-	**-**	-	-	**-**	-

15.4 FACILITY INFORMATION FOR TRAFFIC AND STREET LIGHTING

Facility: Bus Shelters

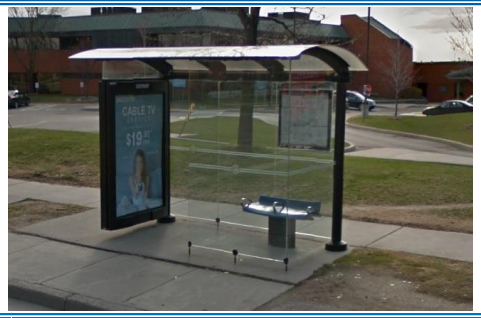
Address: Various Locations, L5B 3C1

Area (m^2): Area (ft^2):

Year Built: Hours per Week :

Facility Group: Traffic/Street Lighting

Building Components:



Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	1,615,588	1,653,815	1,653,815
Electricity ($)	$315,201	$294,875	$251,072
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$315,201	$294,875	$251,072
Total e-kWh	1,615,588	1,653,815	1,653,815
Total e-kWh/m^2	N/A	N/A	N/A
GHG (kg/Yr)	58,161	59,537	59,537
GHG (kg/Yr/m^2)	*N/A*	*N/A*	*N/A*

Energy Measures

Facility: Decorative Bridge Lighting

Address: Nw Cnr Confederation Pkwy & Rathburn Rd, L5B 3C1

Area (m^2): Area (ft^2):

Year Built: Hours per Week :

Facility Group: Traffic/Street Lighting

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	38,007	62,137	47,739
Electricity ($)	$6,607	$8,814	$5,024
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$6,607	$8,814	$5,024
Total e-kWh	38,007	62,137	47,739
Total e-kWh/m^2	N/A	N/A	N/A
GHG (kg/Yr)	1,368	2,237	1,719
GHG (kg/Yr/m^2)	*N/A*	*N/A*	*N/A*

Energy Measures

Facility: Gateway Lighting Feature

Address: 500 Eglinton Ave W - West Entrance, L4Z 1Y8

Area (m^2): Area (ft^2):

Year Built: Hours per Week :

Facility Group: Traffic/Street Lighting

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	3,689	3,679	3,679
Electricity ($)	$654	$592	$496
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$654	$592	$496
Total e-kWh	3,689	3,679	3,679
Total e-kWh/m^2	N/A	N/A	N/A
GHG (kg/Yr)	133	132	132
GHG (kg/Yr/m^2)	*N/A*	*N/A*	*N/A*

Energy Measures

Facility: Street Lighting

Address: Various Locations, L5B 3C1

Area (m^2): Area (ft^2):

Year Built: Hours per Week :

Facility Group: Traffic/Street Lighting

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	4,754,379	2,772,244	2,282,474
Electricity ($)	$902,204	$521,012	$279,016
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$902,204	$521,012	$279,016
Total e-kWh	4,754,379	2,772,244	2,282,474
Total e-kWh/m^2	N/A	N/A	N/A
GHG (kg/Yr)	171,158	99,801	82,169
GHG (kg/Yr/m^2)	*N/A*	*N/A*	*N/A*

Energy Measures

LED Street Lighting

Facility: Street Lighting - LED

Address: Various,

Area (m^2): Area (ft^2):

Year Built: Hours per Week :

Facility Group: Traffic/Street Lighting

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	11,614,118	12,140,331	12,406,722
Electricity ($)	$2,760,609	$2,903,925	$2,148,774
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$2,760,609	$2,903,925	$2,148,774
Total e-kWh	11,614,118	12,140,331	12,406,722
Total e-kWh/m^2	N/A	N/A	N/A
GHG (kg/Yr)	418,108	437,052	446,642
GHG (kg/Yr/m^2)	*N/A*	*N/A*	*N/A*

Energy Measures

Facility: Traffic Bollards

Address: Various Locations, L5B 3C1

Area (m^2): Area (ft^2):

Year Built: Hours per Week :

Facility Group: Traffic/Street Lighting

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	1,249	1,204	1,117
Electricity ($)	$4,581	$4,800	$4,763
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$4,581	$4,800	$4,763
Total e-kWh	1,249	1,204	1,117
Total e-kWh/m^2	N/A	N/A	N/A
GHG (kg/Yr)	45	43	40
GHG (kg/Yr/m^2)	*N/A*	*N/A*	*N/A*

Energy Measures

Facility: Traffic Signals

Address: Various Locations, L5B 3C1

Area (m^2): Area (ft^2):

Year Built: Hours per Week :

Facility Group: Traffic/Street Lighting

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	974,397	980,038	992,903
Electricity ($)	$202,770	$190,634	$165,990
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$202,770	$190,634	$165,990
Total e-kWh	974,397	980,038	992,903
Total e-kWh/m^2	N/A	N/A	N/A
GHG (kg/Yr)	35,078	35,281	35,745
GHG (kg/Yr/m^2)	*N/A*	*N/A*	*N/A*

Energy Measures

16.0 TRANSIT AND ASSOCIATED FACILITIES

16.1 SCOPE AND BOUNDARY

For the purposes of this report, the City of Mississauga has 17 facilities/locations that fall under this category. They include:

- Cawthra Road Station
- CCTT Transitway Terminal
- Central Parkway Station
- City Centre Transit Terminal
- Dixie Rd Station
- Etobicoke Creek Station
- Go Bus Stop
- Malton Satellite Terminal
- Orbitor Drive Station
- Semenyk Crt - T&W Administration-TEP
- Spectrum Way Station
- Tahoe Blvd Station
- Tomken Rd Station
- Edward J. Dowling Transit Facility (Bldg ABCD)
- Transit Central - New Bus Storage Building (Bldg E)
- Transit Central - Body Shop (Bldg F)
- Transit Drivers Lounge & WC

The above listed locations have a total floor area of approximately 55,400 square meters. This would account for 11.9% of the total building area for City of Mississauga facilities included in this Plan.

16.2 BASELINE

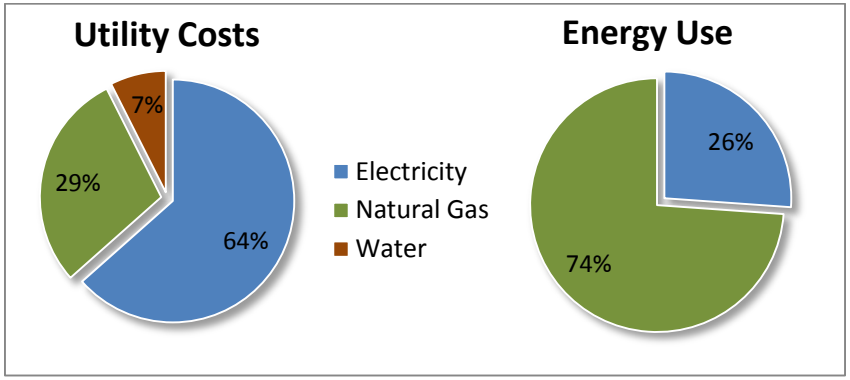
16.2.1 ENERGY USE

The energy use (combined electricity and natural gas) for **Transit and Associated Facilities** was 31,705,000 equivalent kilowatt hours in 2018. Following are the key takeaways for the energy usage in 2018:

- 26% of the total energy usage was due to electricity use, which has dropped by 18.6% since 2013
- 74% of the total energy usage was due to natural gas use, which has increased by 11.6% since 2013
- A total of $1,877,000 in utility costs was incurred, out of which 64% is attributed to electricity, 29% to natural gas, and 7% to water

Transit and Associated Facilities accounted for 10.4% of the City's total utility budget for 2018.

Figure 16-1: Utility Costs and Energy Use Breakdown for Transit and Associated Facilities



16.2.2 ENERGY USE INTENSITY

Energy Use Intensity (EUI) is a measurement that expresses a building's energy use as a function of its size or other characteristic. It is used to give a better picture of the energy efficiency of a facility. The lower the EUI, the more efficient the facility is.

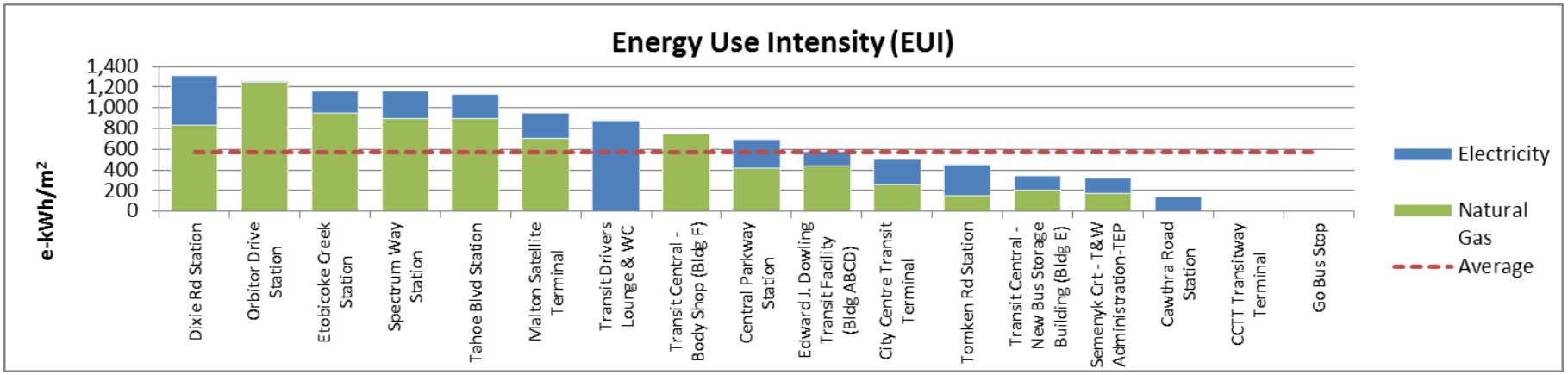
When reviewing EUI, the facility operation type and hours should be taken into account. For example, a facility that operates 24 hours a day will most likely have a higher EUI than a similar one that operates 8 hours a day. Similarly, a facility that has high energy using systems that do not contribute to the building area, such as an outdoor pool or outdoor ice rink, will have a higher EUI than a facility where those systems are located within the facility, as they would add to the facility's area footprint.

For **Transit and Associated Facilities** the average EUI in 2018 was 572.2 e-kWh/m2.

The following chart shows the EUI for each facility within **Transit and Associated Facilities**, and compares it to the average for the group.

Note: The Average EUI value is calculated by taking the total energy use of all facilities, and dividing by the total area of the facilities. As such, a larger facility would have a bigger impact on the average than a smaller facility.

Figure 16-2: Energy Use Intensity for Transit and Associated Facilities

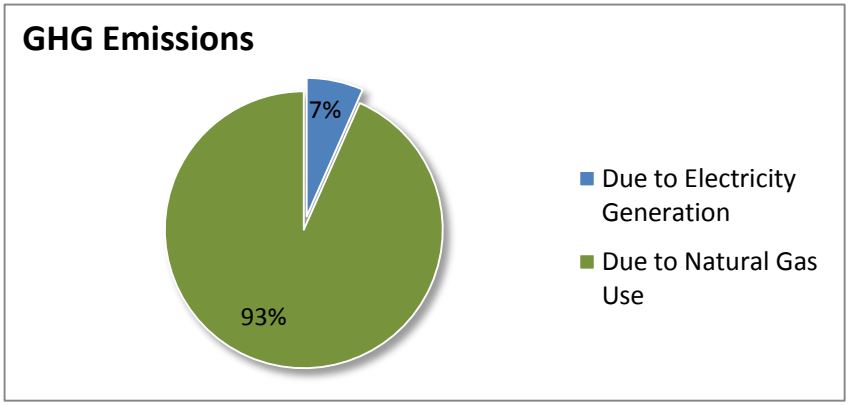


16.2.3 GREENHOUSE GAS (GHG) EMISSIONS

For 2018, **Transit and Associated Facilities** emitted 4,516,400 kg (or 4,516 tonnes) of CO2 in 2018. 6.6% of these emissions were due to the generation of electricity, while the use of natural gas accounted for the remaining 93.4%.

Transit and Associated Facilities accounted for 22.9% of the City's total GHG emissions for facilities included in the plan.

Figure 16-3: GHG Emissions Breakdown for Transit and Associated Facilities

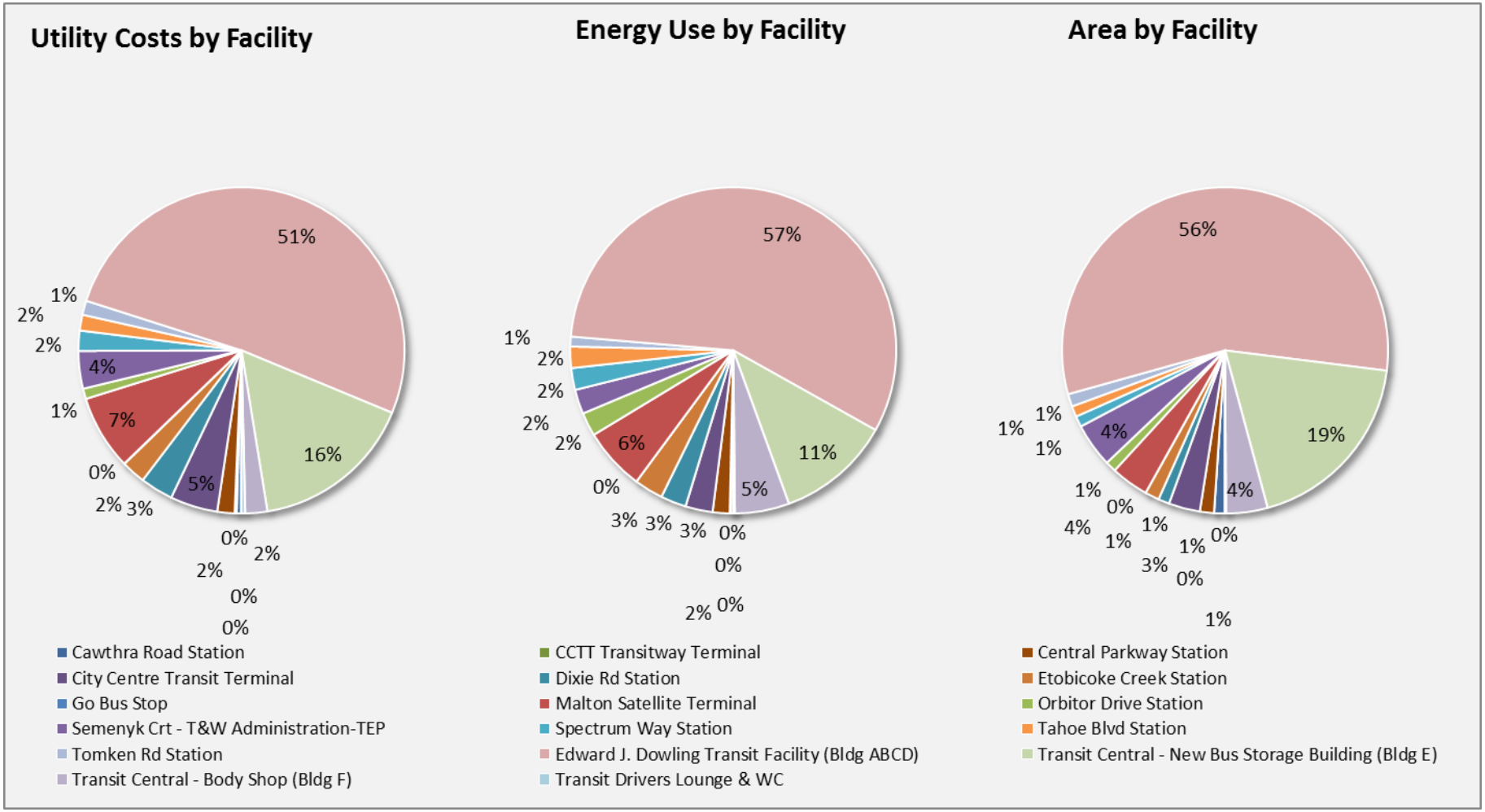


16.3 ENERGY AND GHG BREAKDOWN FOR TRANSIT AND ASSOCIATED FACILITIES

This section provides a brief overview/recap of the Utility and GHG data for **Transit and Associated Facilities**. The table below summarizes, by facility, the utility usage and GHG emissions for 2018. Following are the key takeaways:

- The Transit Central campus consisting of Edward J Dowling Transit Facility (Bldg ABCD), New Bus Storage Building (Bldg E) and Body Shop (Bldg F) is by far the largest facility in this group by area and represents the largest energy consumption (69%) and utility consumption (73%) in this group
- The T&W Administration Building and Malton Satellite Terminal represent the second and third largest facility by area in this group and contribute 8% and 11% towards the energy consumption and utility consumption in the group
- City Centre Transit Terminal and the BRT Stations represent 13% of the facility area in the group and contribute 23% and 16% towards the energy consumption and utility consumption in the group
- Natural gas-fired space heating loads dominate the energy usage in this group, while compressed air equipment, lighting, and fan energy dominate the electrical loads
- For this reason, priority was given to space heating, lighting, and fan energy reduction projects for future planned projects since they greatly reduce utility budget and energy usage

Figure 16-4: Utility Costs and Energy Use Breakdown by Facility



2018 Annual Report for Transit and Associated Facilities

Facility	Area	Electricity		Natural Gas		Total Energy	Water		Total Costs	GHG Emissions
	m^2	kWh	$	m^3	$	e-kWh	m^3	$	$	kg
Cawthra Road Station	600	81,264	$8,942	0	$0	**81,264**	0	$0	**$8,942**	2,926
CCTT Transitway Terminal	0	27,023	$3,469	0	$0	**27,023**	0	$0	**$3,469**	973
Central Parkway Station	773	212,691	$23,532	30,809	$8,745	**536,186**	61	$146	**$32,423**	65,917
City Centre Transit Terminal	1,718	413,874	$65,978	42,112	$11,541	**856,053**	4,379	$10,719	**$88,238**	94,534
Dixie Rd Station	614	294,434	$43,401	48,363	$13,093	**802,240**	2,010	$4,888	**$61,382**	102,053
Etobicoke Creek Station	781	169,723	$26,664	70,411	$18,126	**909,035**	50	$118	**$44,908**	139,257
Go Bus Stop	0	259	$536	0	$0	**259**	0	$0	**$536**	9
Malton Satellite Terminal	2,070	522,537	$76,650	137,858	$34,379	**1,970,042**	11,558	$27,989	**$139,018**	279,500
Orbitor Drive Station	591	683	$1,088	70,327	$18,082	**739,116**	24	$60	**$19,229**	133,013
Semenyk Crt - T&W Administration-TEP	2,422	351,976	$57,026	39,691	$10,963	**768,734**	834	$2,028	**$70,018**	87,727
Spectrum Way Station	591	154,836	$24,073	50,606	$13,566	**686,196**	17	$40	**$37,679**	101,270
Tahoe Blvd Station	591	143,155	$15,926	50,177	$13,304	**670,009**	9	$21	**$29,251**	100,038
Tomken Rd Station	693	207,694	$23,119	9,821	$3,225	**310,809**	80	$114	**$26,458**	26,048
Edward J. Dowling Transit Facility (Bldg ABCD)	31,178	4,238,831	$600,194	1,310,278	$311,086	**17,996,753**	21,397	$51,741	**$963,020**	2,630,334

Transit Central - New Bus Storage Building (Bldg E)	10,412	1,415,188	$214,195	207,384	$49,813	**3,592,722**	16,549	$40,146	**$304,154**	443,110
Transit Central - Body Shop (Bldg F)	2,274	0	$0	162,842	$40,570	**1,709,841**	153	$373	**$40,943**	307,934
Transit Drivers Lounge & WC	56	48,981	$5,745	0	$0	**48,981**	471	$1,147	**$6,892**	1,763
Totals	55,364	8,283,148	$1,190,537	2,230,678	$546,494	**31,705,263**	57,593	$139,528	**$1,876,559**	4,516,405
Usage / Costs per m^2:		155.5	$22.3	40.8	$10.0	**572**	1.1	$2.5	**$33.8**	81.6

16.4 ACTION PLAN

An action plan has been identified with the goal to save on electricity, natural gas, oil, and/or other form of energy consumption within a facility or location.

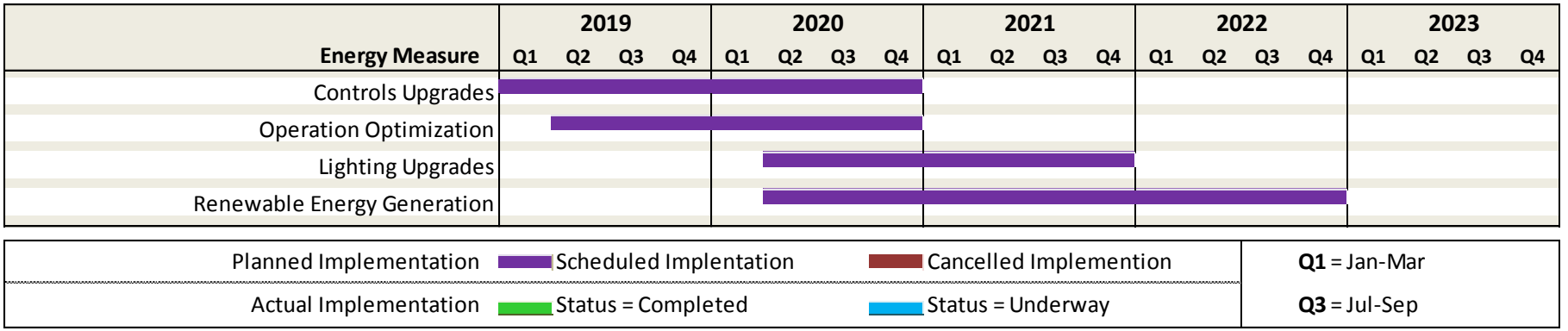
The following figure shows the various projects and initiatives that have been planned for **Transit and Associated Facilities**. The chart shows what projects have been planned, when they are planned to be implemented, and the progress of implementation (if applicable). A brief description of each project has been noted below:

- **Controls Upgrades**: Includes controller upgrades, optimized sequence of operations, and additional points to better manage and control building systems
- **Operation Optimization**: Includes optimizing energy-consuming equipment operation and promoting energy awareness to drive energy efficiency
- **Lighting Upgrades**: Includes replacement of existing lighting technologies to newer technologies like LEDs, and better controls through localized sensors and BAS scheduling
- **Renewable Energy Generation**: Includes energy generation from renewable sources like solar photovoltaics, solar hot water heating, solar lighting

For the chart below, the **Purple** coloured bars represent the original planned start and completion of a Measure type. The **Green** bar beneath shows the actual start and completion times for a completed measure, while the **Blue** bar shows the actual start time of a Measure that is currently being implemented, but not yet complete. Some Notes:

- A Single Measure timeline may include more than one implementation of that measure (example: In different facilities).
- Due to changing circumstances (change in operations, budget changes, new technology, etc.), a planned measure may be cancelled. These would be indicated by a **Red** plan bar on the chart.

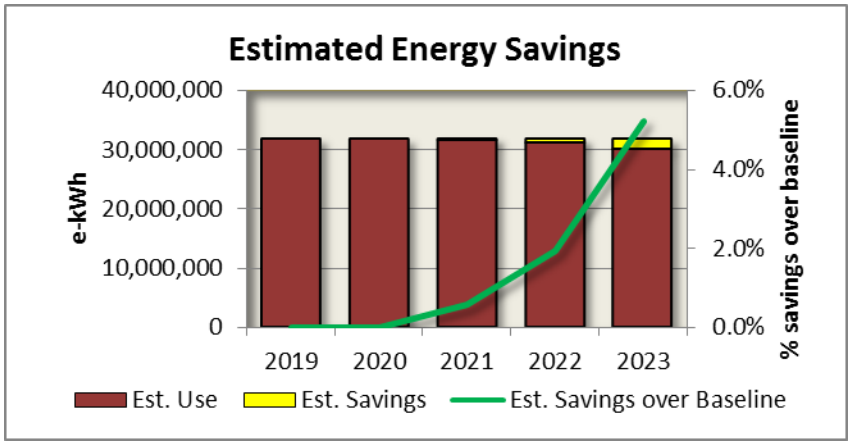
Figure 16-5: Energy Measure Implementation Plan for Transit and Associated Facilities



16.5 ESTIMATED SAVINGS

At the end of the plan, **Transit and Associated Facilities** are expected to save 5.2% over the base year of 2018, which amounts to a total of $207,400 from all the projects.

Figure 16-6: Energy Measure Annual Savings for Transit and Associated Facilities



16.6 PROGRESS TO TARGETS

The City is targeting a 5.2% reduction in energy use in **Transit and Associated Facilities** by 2023 over the base year, 2018. The reporting of energy consumption data and savings for **Transit and Associated Facilities** will be based on utility meters and assembled annually. Since utility meters monitor energy consumption for the entire facility, the measurement boundary will encompass all parts of the facility. To determine the savings and fairly compare year-to-year energy consumption data, it is important to account for independent variables such as weather and occupancy and apply regression analysis to consumption data. Therefore, actual consumption data for each year starting 2019 will be adjusted to match the weather and occupancy of 2018. The figures below show the updated progress for each year against the set target.

Figure 11-7: Annual Energy Use vs Targeted Energy Use for Transit and Associated Facilities

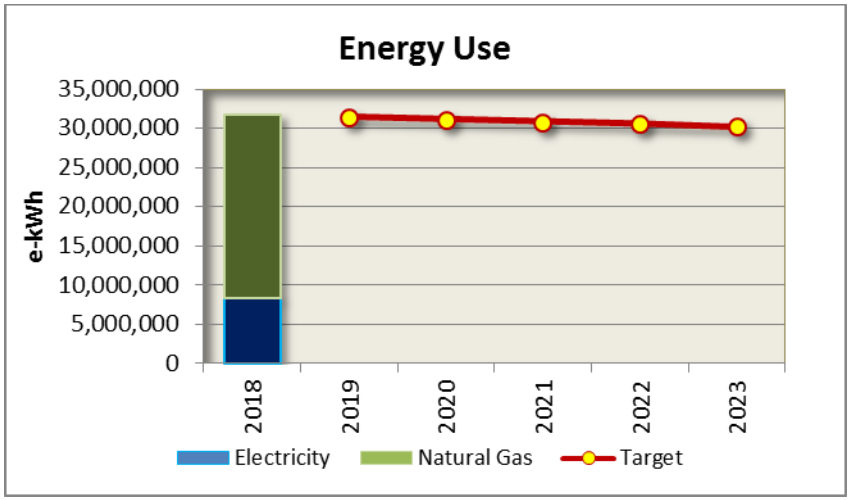
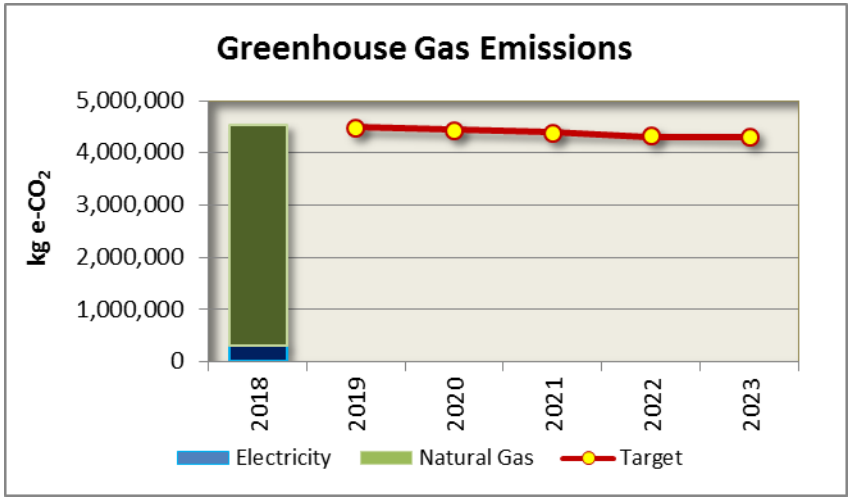


Figure 11-8: Annual GHG Emissions vs Targets for Transit and Associated Facilities



16.7 FACILITY INFORMATION FOR TRANSIT AND ASSOCIATED FACILITIES

Facility: Cawthra Road Station

Address 775 Eastgate Parkway,

Area (m^2): 600 Area (ft^2): 0

Year Built: Hours per Week :

Facility Group: Transit

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	79,332	81,177	81,264
Electricity ($)	$13,894	$11,178	$8,942
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$13,894	$11,178	$8,942
Total e-kWh	79,332	81,177	81,264
Total e-kWh/m^2	132.2	135.3	135.4
GHG (kg/Yr)	2,856	2,922	2,926
GHG (kg/Yr/m^2)	*5*	*5*	*5*

Energy Measures

Facility: CCTT Transitway Terminal

Address: 209 Rathburn Rd W, L5B 4C1

Area (m^2): Area (ft^2):

Year Built: Hours per Week :

Facility Group: Transit

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	27,447	29,680	27,023
Electricity ($)	$4,820	$4,696	$3,469
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$4,820	$4,696	$3,469
Total e-kWh	27,447	29,680	27,023
Total e-kWh/m^2	N/A	N/A	N/A
GHG (kg/Yr)	988	1,068	973
GHG (kg/Yr/m^2)	*N/A*	*N/A*	*N/A*

Energy Measures

Facility: Central Parkway Station

Address: 4325/4327 Central Parkway East,

Area (m^2): 773 Area (ft^2): 8,310

Year Built: Hours per Week :

Facility Group: Transit

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	179,125	212,461	212,691
Electricity ($)	$27,640	$28,605	$23,532
Natural Gas (m^3)	19,746	17,771	30,809
Natural Gas ($)	$5,640	$5,672	$8,745
Water (m^3)	175	253	61
Water ($)	$386	$583	$146
Total Costs ($)	$33,666	$34,860	$32,423
Total e-kWh	386,460	399,053	536,186
Total e-kWh/m^2	499.9	516.2	693.6
GHG (kg/Yr)	43,789	41,253	65,917
GHG (kg/Yr/m^2)	*57*	*53*	*85*

Energy Measures

Facility: City Centre Transit Terminal

Address: 200 Rathburn Rd W, L5B 4E5

Area (m^2): 1,718 Area (ft^2): 8,267

Year Built: 1997 Hours per Week : 168

Facility Group: Transit

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	482,761	466,684	413,874
Electricity ($)	$77,051	$75,239	$65,978
Natural Gas (m^3)	47,513	41,447	42,112
Natural Gas ($)	$6,102	$12,436	$11,541
Water (m^3)	5,965	3,175	4,379
Water ($)	$13,064	$7,236	$10,719
Total Costs ($)	$96,217	$94,912	$88,238
Total e-kWh	981,646	901,881	856,053
Total e-kWh/m^2	571.4	525.0	498.3
GHG (kg/Yr)	107,226	95,178	94,534
GHG (kg/Yr/m^2)	*62*	*55*	*55*

Energy Measures

Energy Upgrades for Lifecycle Replacements
Lighting Upgrades

Facility: Dixie Rd Station

Address: 4440/4442 Dixie Rd,

Area (m^2): 614 Area (ft^2): 6,609

Year Built: Hours per Week :

Facility Group: Transit

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	288,899	233,455	294,434
Electricity ($)	$45,148	$36,961	$43,401
Natural Gas (m^3)	36,329	38,494	48,363
Natural Gas ($)	$9,811	$9,949	$13,093
Water (m^3)	2,245	2,124	2,010
Water ($)	$4,897	$4,857	$4,888
Total Costs ($)	$59,857	$51,767	$61,382
Total e-kWh	670,357	637,644	802,240
Total e-kWh/m^2	1,091.8	1,038.5	1,306.6
GHG (kg/Yr)	79,099	81,197	102,053
GHG (kg/Yr/m^2)	*129*	*132*	*166*

Energy Measures

Facility: Etobicoke Creek Station

Address: 1915 Eglinton Ave E,

Area (m^2): 781 Area (ft^2): 0

Year Built: Hours per Week :

Facility Group: Transit

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	139,163	190,053	169,723
Electricity ($)	$22,865	$30,273	$26,664
Natural Gas (m^3)	60,565	61,791	70,411
Natural Gas ($)	$8,843	$14,737	$18,126
Water (m^3)	30	63	50
Water ($)	$150	$145	$118
Total Costs ($)	$31,858	$45,154	$44,908
Total e-kWh	775,097	838,855	909,035
Total e-kWh/m^2	992.4	1,074.1	1,163.9
GHG (kg/Yr)	119,538	123,688	139,257
GHG (kg/Yr/m^2)	*153*	*158*	*178*

Energy Measures

Facility: Go Bus Stop

Address: Centre View/Station Gate Rd, L5B 3C1

Area (m^2): Area (ft^2):

Year Built: Hours per Week :

Facility Group: Transit

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	892	564	259
Electricity ($)	$658	$616	$536
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$658	$616	$536
Total e-kWh	892	564	259
Total e-kWh/m^2	N/A	N/A	N/A
GHG (kg/Yr)	32	20	9
GHG (kg/Yr/m^2)	*N/A*	*N/A*	*N/A*

Energy Measures

Facility: Malton Satellite Terminal

Address	6780 Professional Court, L4V 1X6		
Area (m^2):	2,070	Area (ft^2):	22,281
Year Built:	1991	Hours per Week :	168
Facility Group:	Transit		
Building Components:	Maintenance Bay; Offices and Meeting Rooms; Outdoor Bus Storage; Wash Bay		

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	593,132	642,778	522,537
Electricity ($)	$92,157	$97,930	$76,650
Natural Gas (m^3)	201,618	153,544	137,858
Natural Gas ($)	$47,108	$39,413	$34,379
Water (m^3)	12,159	11,930	11,558
Water ($)	$27,873	$27,264	$27,989
Total Costs ($)	$167,139	$164,606	$139,018
Total e-kWh	2,710,120	2,254,990	1,970,042
Total e-kWh/m^2	1,309.2	1,089.4	951.7
GHG (kg/Yr)	402,612	313,492	279,500
GHG (kg/Yr/m^2)	*194*	*151*	*135*

Energy Measures

Lighting Upgrades

Facility: Orbitor Drive Station

Address: 5015/5017 Orbitor Drive,

Area (m^2): 591 Area (ft^2): 0

Year Built: Hours per Week :

Facility Group: Transit

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	0	91	683
Electricity ($)	$0	$131	$1,088
Natural Gas (m^3)	0	28,821	70,327
Natural Gas ($)	$0	$7,995	$18,082
Water (m^3)	0	46	24
Water ($)	$0	$185	$60
Total Costs ($)	$0	$8,311	$19,229
Total e-kWh	0	302,708	739,116
Total e-kWh/m^2	0.0	512.2	1,250.6
GHG (kg/Yr)	0	54,503	133,013
GHG (kg/Yr/m^2)	*0*	*92*	*225*

Energy Measures

Facility: Semenyk Crt - T&W Administration-TEP

Address: 3484 Semenyk Court, L5C 4R1

Area (m^2): 2,422 Area (ft^2): 26,070

Year Built: 1989 Hours per Week : 50

Facility Group: Transit

Building Components: Offices and Meeting Rooms

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	304,550	316,402	351,976
Electricity ($)	$52,663	$52,900	$57,026
Natural Gas (m^3)	30,242	32,620	39,691
Natural Gas ($)	$8,229	$9,600	$10,963
Water (m^3)	984	946	834
Water ($)	$2,150	$2,160	$2,028
Total Costs ($)	$63,042	$64,660	$70,018
Total e-kWh	622,087	658,916	768,734
Total e-kWh/m^2	256.8	272.1	317.4
GHG (kg/Yr)	68,151	73,076	87,727
GHG (kg/Yr/m^2)	*28*	*30*	*36*

Energy Measures

Lighting Upgrades

Facility: Spectrum Way Station

Address: 5005/5007 Spectrum Way,

Area (m^2): 591 Area (ft^2): 0

Year Built: Hours per Week :

Facility Group: Transit

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	0	6,654	154,836
Electricity ($)	$0	$1,091	$24,073
Natural Gas (m^3)	0	50,147	50,606
Natural Gas ($)	$0	$13,664	$13,566
Water (m^3)	0	22	17
Water ($)	$0	$131	$40
Total Costs ($)	$0	$14,886	$37,679
Total e-kWh	0	533,194	686,196
Total e-kWh/m^2	0.0	902.2	1,161.1
GHG (kg/Yr)	0	95,067	101,270
GHG (kg/Yr/m^2)	*0*	*161*	*171*

Energy Measures

Facility: Tahoe Blvd Station

Address: 4651/4653 Tahoe Blvd,

Area (m^2): 591 Area (ft^2): 0

Year Built: Hours per Week :

Facility Group: Transit

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	120,400	144,777	143,155
Electricity ($)	$19,402	$20,294	$15,926
Natural Gas (m^3)	49,987	53,548	50,177
Natural Gas ($)	$8,141	$13,850	$13,304
Water (m^3)	7	13	9
Water ($)	$96	$29	$21
Total Costs ($)	$27,639	$34,173	$29,251
Total e-kWh	645,263	707,031	670,009
Total e-kWh/m^2	1,091.8	1,196.3	1,133.7
GHG (kg/Yr)	98,860	106,471	100,038
GHG (kg/Yr/m^2)	*167*	*180*	*169*

Energy Measures

Facility: Tomken Rd Station

Address: 4450/4452 Tomken Rd,

Area (m^2): 693 Area (ft^2): 6,598

Year Built: Hours per Week :

Facility Group: Transit

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	185,732	222,553	207,694
Electricity ($)	$29,859	$29,972	$23,119
Natural Gas (m^3)	19,975	18,574	9,821
Natural Gas ($)	$5,485	$6,147	$3,225
Water (m^3)	196	382	80
Water ($)	$242	$503	$114
Total Costs ($)	$35,585	$36,623	$26,458
Total e-kWh	395,469	417,579	310,809
Total e-kWh/m^2	570.7	602.6	448.5
GHG (kg/Yr)	44,459	43,135	26,048
GHG (kg/Yr/m^2)	*64*	*62*	*38*

Energy Measures

Facility: Edward J. Dowling Transit Facility (Bldg ABCD)

Address	975 Central Parkway W, L5C 3B1		
Area (m^2):	31,178	Area (ft^2):	335,565
Year Built:	1975	Hours per Week :	168
Facility Group:	Transit		
Building Components:	Indoor Bus Storage; Maintenance Bay; Offices and Meeting Rooms; Wash Bay		

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	4,530,854	4,692,156	4,238,831
Electricity ($)	$675,401	$683,984	$600,194
Natural Gas (m^3)	1,276,533	1,233,036	1,310,278
Natural Gas ($)	$300,802	$309,820	$311,086
Water (m^3)	18,106	18,947	21,397
Water ($)	$39,129	$43,221	$51,741
Total Costs ($)	$1,015,333	$1,037,025	$963,020
Total e-kWh	17,934,450	17,639,029	17,996,753
Total e-kWh/m^2	575.2	565.8	577.2
GHG (kg/Yr)	2,577,035	2,500,588	2,630,334
GHG (kg/Yr/m^2)	*83*	*80*	*84*

Energy Measures

Controls Upgrades
Operation Optimization
Renewable Energy Generation

Facility: Transit Central - New Bus Storage Building (Bldg E)

Address	3567 Erindale Station Rd, L5C 2S9		
Area (m^2):	10,412	Area (ft^2):	112,074
Year Built:	2009	Hours per Week :	168
Facility Group:	Transit		
Building Components:	Indoor Bus Storage		

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	1,433,680	1,572,800	1,415,188
Electricity ($)	$229,864	$246,021	$214,195
Natural Gas (m^3)	168,383	172,010	207,384
Natural Gas ($)	$41,668	$45,488	$49,813
Water (m^3)	11,978	14,490	16,549
Water ($)	$29,738	$33,077	$40,146
Total Costs ($)	$301,270	$324,586	$304,154
Total e-kWh	3,201,700	3,378,909	3,592,722
Total e-kWh/m^2	307.5	324.5	345.1
GHG (kg/Yr)	370,025	381,892	443,110
GHG (kg/Yr/m^2)	*36*	*37*	*43*

Energy Measures

Controls Upgrades
Operation Optimization

Facility: Transit Central - Body Shop (Bldg F)

Address	3585 Erindale Station Rd, L5C 2S9		
Area (m^2):	2,274	Area (ft^2):	24,477
Year Built:	2008	Hours per Week :	56
Facility Group:	Transit		
Building Components:	Maintenance Bay		

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	0	0	0
Electricity ($)	$0	$0	$0
Natural Gas (m^3)	148,590	123,796	162,842
Natural Gas ($)	$36,799	$33,386	$40,570
Water (m^3)	185	167	153
Water ($)	$402	$383	$373
Total Costs ($)	$37,201	$33,768	$40,943
Total e-kWh	1,560,193	1,299,861	1,709,841
Total e-kWh/m^2	686.1	571.6	751.9
GHG (kg/Yr)	280,983	234,099	307,934
GHG (kg/Yr/m^2)	*124*	*103*	*135*

Energy Measures

Controls Upgrades
Operation Optimization

Facility: Transit Drivers Lounge & WC

Address: 7205 Goreway Dr, L5B 3C1

Area (m^2): 56 Area (ft^2): 603

Year Built: Hours per Week :

Facility Group: Transit

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	36,353	50,174	48,981
Electricity ($)	$8,843	$7,329	$5,745
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	420	401	471
Water ($)	$908	$916	$1,147
Total Costs ($)	$9,750	$8,244	$6,892
Total e-kWh	36,353	50,174	48,981
Total e-kWh/m^2	649.2	896.0	874.7
GHG (kg/Yr)	1,309	1,806	1,763
GHG (kg/Yr/m^2)	*23*	*32*	*31*

Energy Measures

17.0 SERVICE YARDS, CENTRAL STORES, AND MAINTENANCE FACILITIES

17.1 SCOPE AND BOUNDARY

For the purposes of this report, the City of Mississauga has 7 facilities/locations that fall under this category. They include:

- Clarkson Yard
- Lakefront Promenade Maintenance Depot
- Malton Yard
- Mavis Maintenance Hut
- Mavis North
- Mavis South
- Meadowvale Depot

The above listed locations have a total floor area of approximately 15,700 square meters. This would account for 3.4% of the total building area for City of Mississauga facilities included in this Plan.

17.2 BASELINE

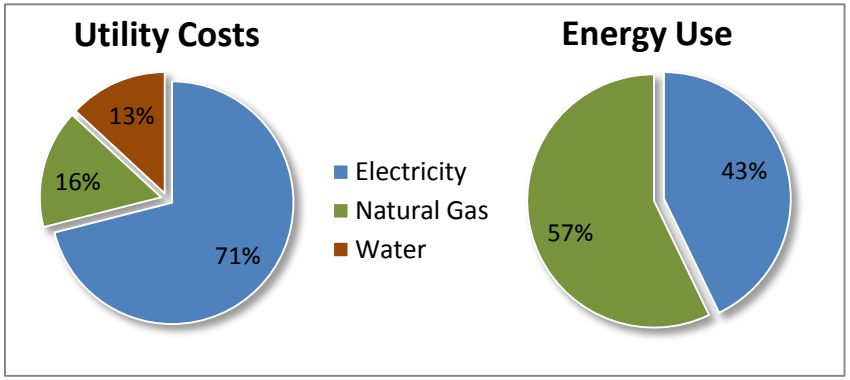
17.2.1 ENERGY USE

The energy use (combined electricity and natural gas) for **Service Yards, Central Stores, and Maintenance Facilities** was 5,495,000 equivalent kilowatt hours in 2018. Following are the key takeaways for the energy usage in 2018:

- 43% of the total energy usage was due to electricity use, which has remained consistent since 2013
- 57% of the total energy usage was due to natural gas use, which has dropped by 2.7% since 2013
- A total of $507,000 in utility costs was incurred, out of which 71% is attributed to electricity, 16% to natural gas, and 13% to water

Service Yards, Central Stores, and Maintenance Facilities accounted for 2.8% of the City's total utility budget for 2018.

Figure 17-1: Utility Costs and Energy Use Breakdown for Service Yards, Central Stores, and Maintenance Facilities



17.2.2 ENERGY USE INTENSITY

Energy Use Intensity (EUI) is a measurement that expresses a building's energy use as a function of its size or other characteristic. It is used to give a better picture of the energy efficiency of a facility. The lower the EUI, the more efficient the facility is.

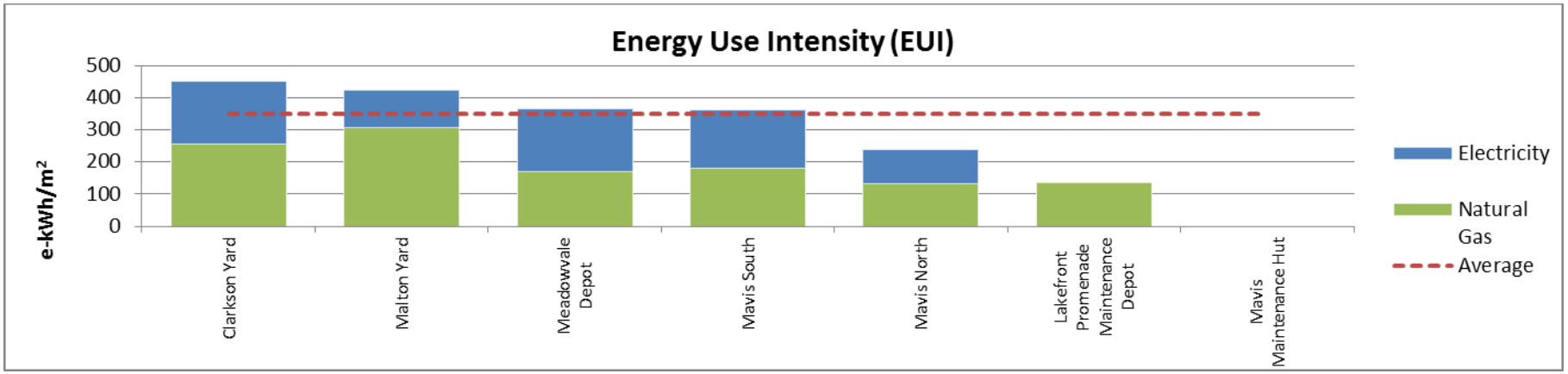
When reviewing EUI, the facility operation type and hours should be taken into account. For example, a facility that operates 24 hours a day will most likely have a higher EUI than a similar one that operates 8 hours a day. Similarly, a facility that has high energy using systems that do not contribute to the building area, such as an outdoor pool or outdoor ice rink, will have a higher EUI than a facility where those systems are located within the facility, as they would add to the facility's area footprint.

For **Service Yards, Central Stores, and Maintenance Facilities** the average EUI in 2018 was 348.9 e-kWh/m2.

The following chart shows the EUI for each facility within **Service Yards, Central Stores, and Maintenance Facilities**, and compares it to the average for the group.

Note: The Average EUI value is calculated by taking the total energy use of all facilities, and dividing by the total area of the facilities. As such, a larger facility would have a bigger impact on the average than a smaller facility.

Figure 17-2: Energy Use Intensity for Service Yards, Central Stores, and Maintenance Facilities

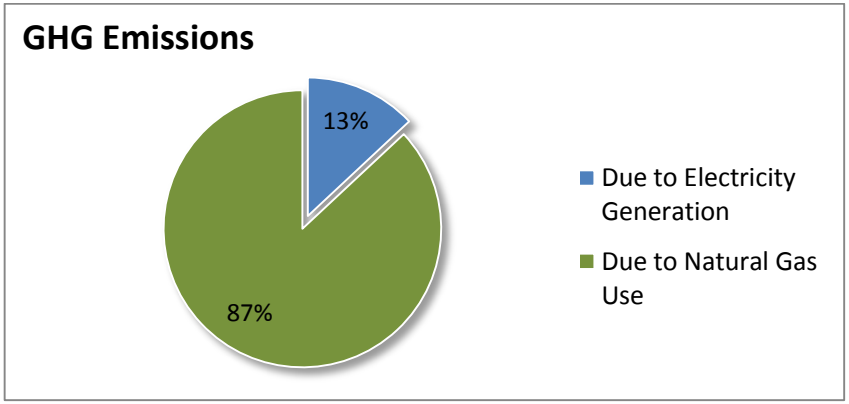


17.2.3 GREENHOUSE GAS (GHG) EMISSIONS

For 2018, **Service Yards, Central Stores, and Maintenance Facilities** emitted 650,400 kg (or 650 tonnes) of CO2 in 2018. 13.0% of these emissions were due to the generation of electricity, while the use of natural gas accounted for the remaining 87.0%.

Service Yards, Central Stores, and Maintenance Facilities accounted for 3.3% of the City's total GHG emissions for facilities included in the plan.

Figure 17-3: GHG Emissions Breakdown for Service Yards, Central Stores, and Maintenance Facilities

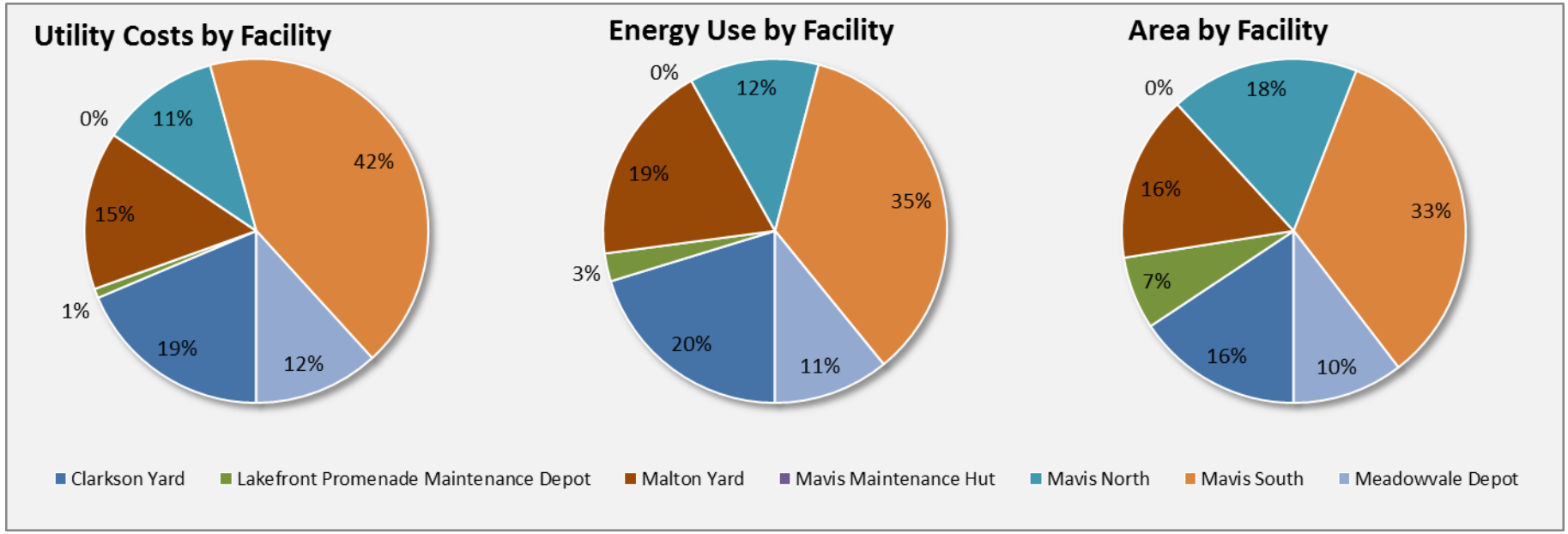


17.3 ENERGY AND GHG BREAKDOWN FOR SERVICE YARDS, CENTRAL STORES, AND MAINTENANCE FACILITIES

This section provides a brief overview/recap of the Utility and GHG data for **Service Yards, Central Stores, and Maintenance Facilities**. The table below summarizes, by facility, the utility usage and GHG emissions for 2018. Following are the key takeaways:

- The Mavis Yards are the largest facility in this group by area and contribute 47% and 53% towards energy consumption and utility consumption in this group
- The Clarkson Yard is the second largest facility in this group by area and contribute 20% and 19% towards energy consumption and utility consumption in this group
- The Malton Yard is the third largest facility in this group by area and contribute 19% and 15% towards energy consumption and utility consumption in this group
- Meadowvale Depot and Lakefront Promenade Maitenance Depot represent the remaining facility area in the group and contribute 14% and 13% towards the energy consumption and utility consumption in the group

Figure 16-4: Utility Costs and Energy Use Breakdown by Facility



2018 Annual Report for Service Yards, Central Stores, and Maintenance Facilities

Facility	Area	Electricity		Natural Gas		Total Energy	Water		Total Costs	GHG Emissions
	m^2	kWh	$	m^3	$	e-kWh	m^3	$	$	kg
Clarkson Yard	2,466	479,785	$73,542	60,368	$15,716	**1,113,645**	2,152	$5,235	**$94,493**	131,427
Lakefront Promenade Maintenance Depot	1,078	0	$0	13,762	$4,418	**144,501**	19	$47	**$4,465**	26,024
Malton Yard	2,466	287,055	$46,172	72,111	$18,513	**1,044,223**	4,398	$10,836	**$75,521**	146,696
Mavis Maintenance Hut	0	0	$0	0	$0	**0**	0	$0	**$0**	0
Mavis North	2,799	303,495	$45,686	34,870	$9,788	**669,629**	635	$1,543	**$57,017**	76,865
Mavis South	5,299	963,772	$145,408	91,515	$24,230	**1,924,683**	18,925	$46,229	**$215,866**	207,751
Meadowvale Depot	1,640	319,761	$49,363	26,489	$7,662	**597,893**	1,065	$2,596	**$59,621**	61,602
Totals	15,748	2,353,868	$360,171	299,115	$80,326	**5,494,574**	27,195	$66,485	**$506,983**	650,365
Usage / Costs per m^2:		160.5	$24.6	19.0	$5.1	**349**	1.7	$4.2	**$32.2**	41.3

17.4 ACTION PLAN

An action plan has been identified with the goal to save on electricity, natural gas, oil, and/or other form of energy consumption within a facility or location.

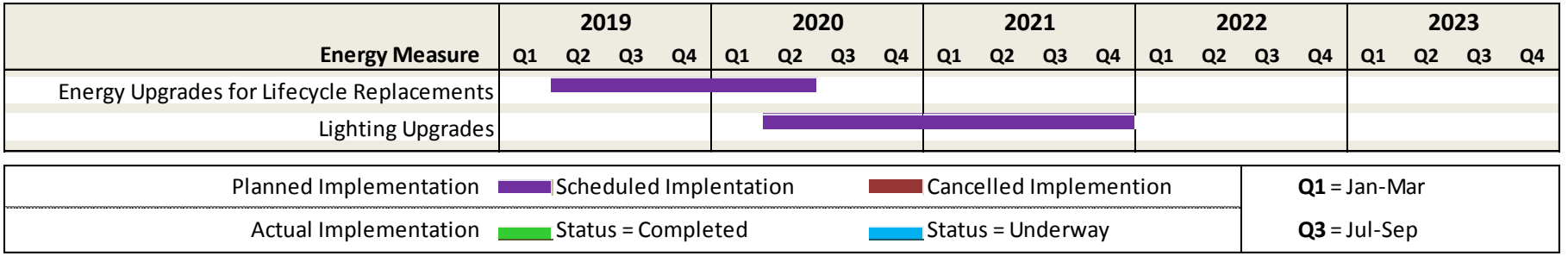
The following figure shows the various projects and initiatives that have been planned for **Service Yards, Central Stores, and Maintenance Facilities**. The chart shows what projects have been planned, when they are planned to be implemented, and the progress of implementation (if applicable). A brief description of each project has been noted below:

- **Energy Upgrades for Lifecycle Replacements**: Includes energy upgrades for high capital assets that show economic paybacks only at the time of replacement like envelope and HVAC equipment
- **Lighting Upgrades**: Includes replacement of existing lighting technologies to newer technologies like LEDs, and better controls through localized sensors and BAS scheduling

For the chart below, the **Purple** coloured bars represent the original planned start and completion of a Measure type. The **Green** bar beneath shows the actual start and completion times for a completed measure, while the **Blue** bar shows the actual start time of a Measure that is currently being implemented, but not yet complete. Some Notes:

- A Single Measure timeline may include more than one implementation of that measure (example: In different facilities).
- Due to changing circumstances (change in operations, budget changes, new technology, etc.), a planned measure may be cancelled. These would be indicated by a **Red** plan bar on the chart.

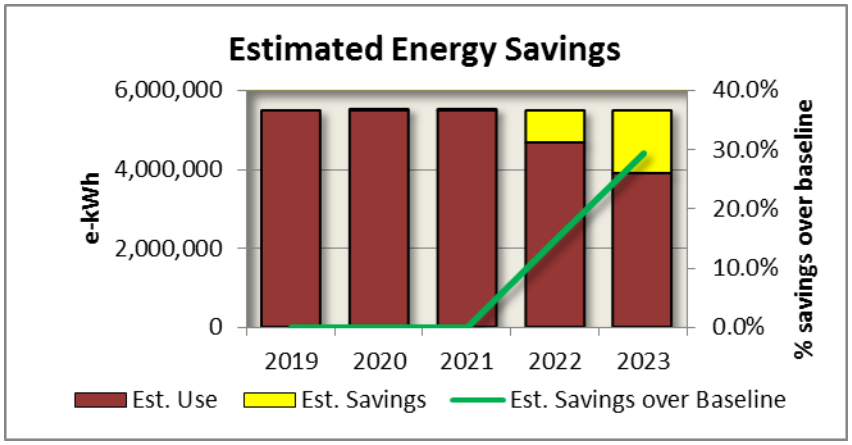
Figure 16-5: Energy Measure Implementation Plan for Service Yards, Central Stores, and Maintenance Facilities



17.5 ESTIMATED SAVINGS

At the end of the plan, **Service Yards, Central Stores, and Maintenance Facilities** are expected to save 29.4% over the base year of 2018, which amounts to a total of $220,725 from all the projects.

Figure 16-6: Energy Measure Annual Savings for Service Yards, Central Stores, and Maintenance Facilities



17.6 PROGRESS TO TARGETS

The City is targeting a 29.4% reduction in energy use in **Service Yards, Central Stores, and Maintenance Facilities** by 2023 over the base year, 2018. The reporting of energy consumption data and savings for **Service Yards, Central Stores, and Maintenance Facilities** will be based on utility meters and assembled annually. Since utility meters monitor energy consumption for the entire facility, the measurement boundary will encompass all parts of the facility. To determine the savings and fairly compare year-to-year energy consumption data, it is important to account for independent variables such as weather and occupancy and apply regression analysis to consumption data. Therefore, actual consumption data for each year starting 2019 will be adjusted to match the weather and occupancy of 2018. The figures below show the updated progress for each year against the set target.

Figure 11-7: Annual Energy Use vs Targeted Energy Use for Service Yards, Central Stores, and Maintenance Facilities

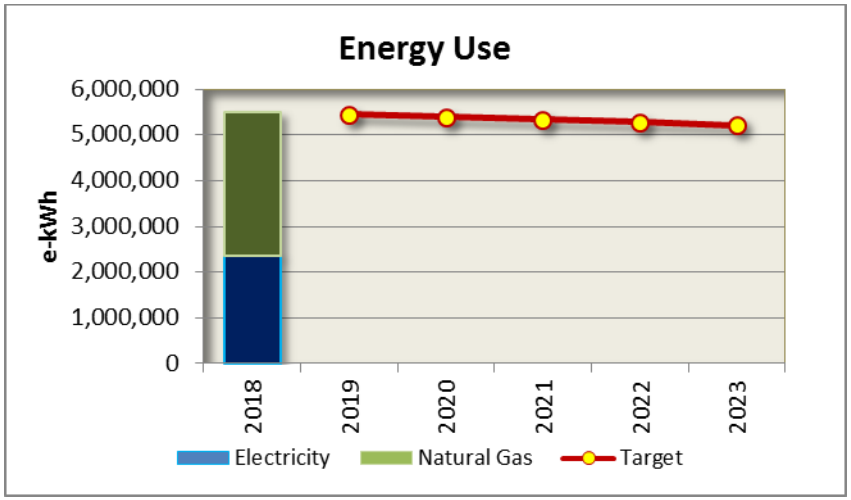
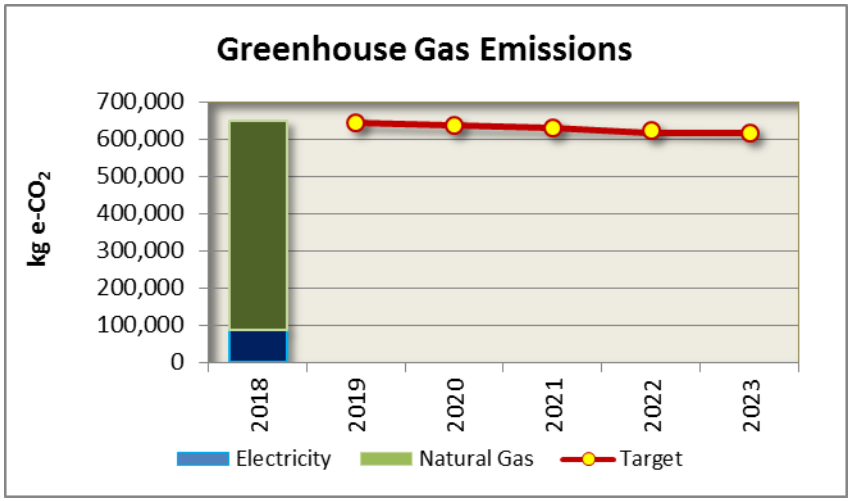


Figure 11-8: Annual GHG Emissions vs Targets for Service Yards, Central Stores, and Maintenance Facilities



17.7 FACILITY INFORMATION FOR SERVICE YARDS, CENTRAL STORES, AND MAINTENANCE FACILITIES

Facility: Clarkson Yard

Address: 2167 Royal Windsor Dr, L5J 1K5

Area (m^2): 2,466 Area (ft^2): 26,544

Year Built: 1977 Hours per Week : 94.5

Facility Group: Yard/Maintenance Depot

Building Components: Maintenance Bay; Offices and Meeting Rooms

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	460,140	495,236	479,785
Electricity ($)	$74,344	$79,454	$73,542
Natural Gas (m^3)	68,800	74,257	60,368
Natural Gas ($)	$17,695	$20,554	$15,716
Water (m^3)	2,791	2,129	2,152
Water ($)	$7,253	$4,867	$5,235
Total Costs ($)	$99,292	$104,876	$94,493
Total e-kWh	1,182,536	1,274,936	1,113,645
Total e-kWh/m^2	479.5	517.0	451.6
GHG (kg/Yr)	146,665	158,249	131,427
GHG (kg/Yr/m^2)	*59*	*64*	*53*

Energy Measures

Energy Upgrades for Lifecycle Replacements
Lighting Upgrades

Facility: Lakefront Promenade Maintenance Depot

Address: 725 Lakefront Promenade, L5E 3G9

Area (m^2): 1,078 Area (ft^2): 11,603

Year Built: 1988 Hours per Week : 63

Facility Group: Yard/Maintenance Depot

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	0	0	0
Electricity ($)	$0	$0	$0
Natural Gas (m^3)	14,571	11,611	13,762
Natural Gas ($)	$4,522	$4,039	$4,418
Water (m^3)	10	0	19
Water ($)	$22	-$111	$47
Total Costs ($)	$4,544	$3,928	$4,465
Total e-kWh	152,991	121,917	144,501
Total e-kWh/m^2	141.9	113.1	134.0
GHG (kg/Yr)	27,553	21,957	26,024
GHG (kg/Yr/m^2)	*26*	*20*	*24*

Energy Measures

Facility: Malton Yard

Address: 7100 Fir Tree Dr, L5S 1G5

Area (m^2): 2,466 Area (ft^2): 26,544

Year Built: 1977 Hours per Week : 94.5

Facility Group: Yard/Maintenance Depot

Building Components: Maintenance Bay; Offices and Meeting Rooms

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	299,357	294,302	287,055
Electricity ($)	$50,429	$49,310	$46,172
Natural Gas (m^3)	67,599	71,338	72,111
Natural Gas ($)	$17,496	$19,704	$18,513
Water (m^3)	3,367	3,202	4,398
Water ($)	$8,190	$7,325	$10,836
Total Costs ($)	$76,116	$76,339	$75,521
Total e-kWh	1,009,148	1,043,351	1,044,223
Total e-kWh/m^2	409.2	423.1	423.4
GHG (kg/Yr)	138,607	145,495	146,696
GHG (kg/Yr/m^2)	*56*	*59*	*59*

Energy Measures

Lighting Upgrades

Facility: Mavis Maintenance Hut

Address: 3235 Mavis Rd, L5C 1T7

Area (m^2): Area (ft^2):

Year Built: 1964 Hours per Week : 70

Facility Group: Yard/Maintenance Depot

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	0	0	0
Electricity ($)	$0	$0	$0
Natural Gas (m^3)	0	0	0
Natural Gas ($)	$0	$0	$0
Water (m^3)	0	0	0
Water ($)	$0	$0	$0
Total Costs ($)	$0	$0	$0
Total e-kWh	0	0	0
Total e-kWh/m^2	N/A	N/A	N/A
GHG (kg/Yr)	0	0	0
GHG (kg/Yr/m^2)	*N/A*	*N/A*	*N/A*

Energy Measures

Facility: Mavis North

Address: 3235 Mavis Rd, L5C 1T7

Area (m^2): 2,799 Area (ft^2): 30,128

Year Built: 1982 Hours per Week : 50

Facility Group: Yard/Maintenance Depot

Building Components:

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	330,078	303,329	303,495
Electricity ($)	$52,923	$48,329	$45,686
Natural Gas (m^3)	31,706	32,037	34,870
Natural Gas ($)	$8,102	$9,531	$9,788
Water (m^3)	759	640	635
Water ($)	$1,643	$1,461	$1,543
Total Costs ($)	$62,667	$59,321	$57,017
Total e-kWh	662,992	639,720	669,629
Total e-kWh/m^2	236.9	228.6	239.2
GHG (kg/Yr)	71,839	71,502	76,865
GHG (kg/Yr/m^2)	*26*	*26*	*27*

Energy Measures

Lighting Upgrades

Facility: Mavis South

Address: 3185 Mavis Rd, L5C 1T7

Area (m^2): 5,299 Area (ft^2): 57,038

Year Built: 1956 Hours per Week : 94.5

Facility Group: Yard/Maintenance Depot

Building Components: Machine Shop; Maintenance Bay; Offices and Meeting Rooms

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	908,264	990,919	963,772
Electricity ($)	$150,723	$156,648	$145,408
Natural Gas (m^3)	75,460	90,775	91,515
Natural Gas ($)	$19,501	$25,197	$24,230
Water (m^3)	7,627	10,861	18,925
Water ($)	$16,818	$24,860	$46,229
Total Costs ($)	$187,042	$206,705	$215,866
Total e-kWh	1,700,593	1,944,060	1,924,683
Total e-kWh/m^2	320.9	366.9	363.2
GHG (kg/Yr)	175,392	207,329	207,751
GHG (kg/Yr/m^2)	*33*	*39*	*39*

Energy Measures

Lighting Upgrades

Facility: Meadowvale Depot

Address: 6300 Millcreek Dr, L5N 7K1

Area (m^2): 1,640 Area (ft^2): 17,653

Year Built: 1980 Hours per Week : 94.5

Facility Group: Yard/Maintenance Depot

Building Components: Maintenance Bay; Offices and Meeting Rooms

Historical Energy and GHG Data

Year:	2016	2017	2018
Electricity (kWh)	376,113	327,005	319,761
Electricity ($)	$60,857	$52,180	$49,363
Natural Gas (m^3)	21,871	23,268	26,489
Natural Gas ($)	$6,387	$7,136	$7,662
Water (m^3)	566	1,584	1,065
Water ($)	$2,371	$3,623	$2,596
Total Costs ($)	$69,615	$62,939	$59,621
Total e-kWh	605,760	571,324	597,893
Total e-kWh/m^2	369.4	348.4	364.6
GHG (kg/Yr)	54,898	55,773	61,602
GHG (kg/Yr/m^2)	*33*	*34*	*38*

Energy Measures

Energy Upgrades for Lifecycle Replacements
Lighting Upgrades

APPENDIX 1.0: MEASURE TYPE INFORMATION

A1.1 PROJECTS

Project = Technological – operational & technological actions.

Examples: Lighting retrofit, new controls, efficient boiler, etc.

A1.1.1 BUILDING ENVELOPE

Building Envelope Sealing	Minimizing heat loss by installing weather stripping on windows and doors, improving the building envelope. Saves natural gas for heating.
Window Coating	Installing a film on building windows to: a) reduce heat loss in winter, cutting heating load; and b) reduce heat gain in summer, cutting air conditioning load. Saves both natural gas and electricity.

A1.1.2 CONTROLS

BAS Installation	Installation of a Building Automation System (BAS). Can also be known as a Building Management System. A BAS is a network of controllers designed to monitor and control the mechanical (HVAC, ventilation, and dehumidification) and lighting systems of a building. The BAS can be used to operate the equipment on a schedule, i.e. setting back, or turning off, during unoccupied periods.
BAS Upgrade	An upgrade or modification to an existing Building Automation System. Usually entails new equipment, or improvements to the controls and/or control strategy.
CO2 Controls	Controls used to monitor CO2 levels in a space and adjust fresh air ventilation according to needs. That reduces outside air brought into the building during unoccupied periods, reducing the need to heat/cool the air.
Ice Controls	Controls used to monitor ice temperature and control the ice plant in an arena. Allows for adjustments to ice temperature depending on use type, and save energy during unoccupied periods by setting back temperatures.
Lighting Controls	Installation of new controls to better operate lighting. Could include: • Occupancy sensors to turn off lighting when a room is unoccupied. • Scheduling control (through a BAS or other control system), enabling the lighting to be on or off as required.

Programmable Thermostats	Designed to adjust the temperature according to a series of programmed settings that take effect at different times. Programmable thermostats may also be called setback thermostats or clock thermostats.
Unit Heater Disconnect	Controls that sense when a large garage or bay door is left open and turns off the unit heaters in the immediate area.
Vending Miser	Special controls that turn off a vending machine, and turn it on when someone approaches by means of a sensor. The controls also cycle the compressors in the unit to ensure the contents stay cold.

A1.1.3 ENERGY DASHBOARD

Energy Dashboard	Computerized display showing a facility's energy (electricity and natural gas) and water usage, both current, and over a period of time. The Energy Dashboard helps increase the energy awareness of facility operations staff and the public.

A1.1.4 EQUIPMENT UPGRADE

AHU Replacement	Replacing an Air Handling Unit (or rooftop, furnace or other general HVAC piece of equipment) with a higher efficiency unit.
Boiler Replacement	Replacing an existing boiler with a higher efficiency boiler. Normally performed when the existing equipment is at or near the end of its useful life.
Chiller Replacement	Replacing a chiller (used in air conditioning and ice plants) with a more efficient unit. Normally performed when the existing equipment is at or near the end of its useful life.
Desiccant Dehumidifier	Installation of a gas fired dehumidifier to replace an electric unit.
Free Cooling	Using outside air to provide cool a facility rather than an air conditioning unit. Generally done during shoulder seasons (i.e. spring and fall) when the temperatures are cool.
Heater Replacement	Replacing a heater with a more efficient unit.
Infrared Unit Heater	Replacing an electric or forced air unit heater with a more efficient infrared unit heater. An infrared unit heater heats the objects in the space, rather than the air, avoiding the loss of heat when doors are opened. Usually installed in areas with large garage doors (fire stations, truck bays, etc.).
Insulation	Adding/fixing insulation on piping carrying hot fluids, on ductwork or equipment. The insulation helps reduce heat

loss and saves on energy required for heating.

A1.1.5 HEAT RECOVERY

Waste Heat Recovery	A process that takes advantage of waste heat, i.e. the heat from exhaust air, the ice-making process in an arena or water drained from a pool. This waste heat can be used for preheating incoming air, space heating or pre-heating the hot water in the facility.

A1.1.6 IMPLEMENT NEW MEASURES

Energy Audit Measures	Implementation of measures determined by the Energy Audit
Re-commissioning Measures	Implementation of measures determined by Re-commissioning

A1.1.7 LIGHTING

LED Arena/Pool Lighting	Replacing the lighting, usually metal halide or mercury vapour, in an arena and/or pool with LED fixtures. The LED fixture would provide higher efficiency (lower energy use), better life (lower maintenance costs), and better control (dimming, on/off control).
LED Lighting Retrofit	Replacing the standard lighting with LED fixtures. The LED fixture would provide higher efficiency (lower energy use), better life (lower maintenance costs), and better control (dimming, on/off control).
LED Parking Lot	Replacing the standard lighting in a parking lot with LED fixtures. The LED fixture would provide higher efficiency (lower energy use), better life (lower maintenance costs), and better control (dimming, on/off control).
LED Street Lighting	Replacing the standard street lighting with LED fixtures. The LED fixture would provide higher efficiency (lower energy use), better life (lower maintenance costs), and better control (dimming during shoulder hours).
Lighting Retrofit	Modification to the lighting of a facility to save energy. Can involve: • Replacing existing lighting with more efficient type lamps and fixture. • Reducing lighting where areas are over lit. • Installation of occupancy sensors and other controls to turn off lights when spaces are unoccupied.

A1.1.8 MAINTENANCE

Equipment	Repairing existing equipment for energy efficiency. This does not include all maintenance performed on equipment.

Maintenance

Equipment Optimization	Adjustments of the operation or controls of equipment to make it operate more efficiently in general and energy efficiently.

A1.1.9 NEW TECHNOLOGY

New Technology	Installation of a new or recent technology or equipment meant to improve energy efficiency. Generally, unproven technology is installed at a single location for testing. Once proven, it is then installed in more facilities/locations.

A1.1.10 RENEWABLE ENERGY

Solar Photovoltaic	Installation of solar panels to generate electricity from the energy of the sun.
Solar Water Heating	A system that uses heat from the sun to pre-heat the domestic hot water of a building.

A1.1.11 VARIABLE SPEED DRIVE

Pool VSD	A Variable Speed Drive (VSD) that installed to control the speed of a pools filtration pump. The filtration system, the system that removes contaminants from the pool water, is generally designed to operate at speeds based on full occupancy of the pool. The VSD controls allows the pump motor to operate at lower speeds during periods of low to no occupancy (periods where the contaminant levels are low), savings large amounts of energy.
Variable Speed Drive	Installation of controls on electric motors which allows the motor speed to be reduced when the requirements on the motor or equipment are lower. A slight reduction in the speed of an electric motor can have huge savings in electricity.

A1.1.12 WATER

Water Retrofit	A water retrofit generally involves installing more efficient washroom fixtures, including: • low flow toilets; • faucet aerators and low flow shower heads; • faucet/tap sensors; and • toilet/urinal flush sensors. Reducing hot water use saves the natural gas (or electricity) required for heating the water.

A1.2 PROCESSES

Process = Organizational – building an energy managing culture.

Examples: Turning off equipment at night, implementing start up and shut down schedules, etc.

A1.2.1 CONTROLS

Control Optimization Optimizing the controls for equipment to provide more efficient operation. Includes:

- Improving equipment schedules to better match usage patterns and setback during periods of non-occupancy or non-use.
- Adjusting set points such as temperatures and outside air volumes, to save energy while maintaining building comfort.
- Adjusting the way equipment runs to improve its efficiency.

A1.3 PROGRAMS

Program = People – Awareness, habits, procedures & feedback.

Examples: Training staff in energy awareness, Employee Participation Program-Identification of Improvements.

A1.3.1 ENERGY AWARENESS

Energenius A strategy to help staff understand and accept the importance of energy conservation at all City facilities, and the initiatives of the Energy Management Team.

Includes a program that recognizes City employees for providing energy efficiency ideas.

EBEAR Stands for Energy Benchmarking, Energy Awareness and Retro-commissioning (EBEAR). The City launched the program in January 2012 to improve energy performance in City-owned and operated facilities. The three elements:

1. Energy Benchmarking compares a facility's EUI to other facilities of the same type, ranks a facility relative to the best in the portfolio of facilities, and sets targets for energy cost reduction.
2. Energy Awareness efforts help train and educate facility staff and users on how energy resources are being used in a facility, and how their actions can help bring down operating costs, reduce greenhouse gas emissions,

and create a better environment.

3. Retro-commissioning identifies less-than-optimal performance in a facility's existing equipment and control systems, and makes necessary upgrades or enhancements to save energy and cost.

Energy Champion

An Energy Champion is the "voice of energy efficiency" committed to improve the energy performance of City facilities by:

- Promoting energy conservation and building an energy-saving culture in our workplace.
- Being a point of contact for energy-related issues within a facility.
- Advocating for energy efficiency and conservation in regular staff or departmental meetings.
- Motivating staff to help maintain efficient operations within a facility.

Green Leaders

An ongoing program to provide information and incentives to staff to take sustainable actions and monitor environmental sustainability in the workplace. The ultimate goal is to create a green culture throughout the corporation.

Training

Providing training to City staff to help improve their energy awareness in key areas, such as BAS operation.

APPENDIX 2.0: DEFINITIONS

Below are definitions of some terms that may appear in this document.

AHU	**A**ir **H**andling **U**nit. A device used to condition (heat or cool) and circulate air as part of a heating, ventilating, and air-conditioning (HVAC) system.
BAS	**B**uilding **A**utomation **S**ystem. Sometimes also referred to as a Building Management System (BMS). A BAS is a computer network of electronic devices designed to monitor and control a building's mechanical, security, fire and flood safety, lighting, HVAC and humidity control and ventilation systems.
CO_2	Carbon dioxide. A greenhouse gas that contributes to the greenhouse effect (See **Greenhouse Gas**)
Cubic Meter	Measurement of volume commonly used for natural gas. Can also be denoted as **m^3** 1 cubic meter of natural gas contains approximately 10.5equivalenet kilowatt hours of energy (1 m^3 = 10.5 e-kWh)
Conservation and Demand Management	The reduction or conservation of electricity and natural gas consumption and peak electricity demand.
Domestic Hot Water	Water used in washrooms, kitchens and showers. Does not include water used in pools or building heating.
Electricity Consumption	The electrical energy actually used. Measured in kilowatt hours. Example: ten 100-watt light bulbs used for 2 hours would consume 2,000 watts-hours, or 2 kilowatt-hours (10 x 100 watt x 2 hours = 2,000 watt-hours = 2 kWh)
Electricity Demand	The rate of using electricity. Measures in kilowatts. Example: ten 100-watt light bulbs consume electricity at a rate of 1,000 watts, or 1 kilowatt. The peak demand is the highest rate of electricity use during a given period of time.

Emission Factor	Representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. Usually expressed as the weight of pollutant divided by a unit weight, volume, distance, or duration of the activity emitting the pollutant (e.g., kilograms of CO_2 emitted per cubic meter of natural gas burned)
Energy Efficiency Measure	An action or work done to save on electricity, natural gas, oil, or other form of energy consumption, within City of Mississauga facilities. Each measure can be classified as a **Project**, a **Process**, or a **Program** (see definition for each).
Energy Use Intensity	Also referred to as EUI, a measurement that essentially expresses a building's energy use as a function of its size or other characteristics. The measurement used in this plan for EUI is e-kWh/m^2
Equivalent kilowatt hour	An equivalent kilowatt hour (**e-kWh**) is the conversion of an unit of energy to a common unit to better compare different types of energy sources. Example: Converting a cubic meter (see **Cubic Meter**) of natural gas to an equivalent kilowatt hour measure to compare to electricity usage in kilowatt hours. 1 e-kWh is comparable to 1 kWh in energy terms
EUI	See **Energy Use Intensity**
Facilities and Property Development	A section of the City's Facility and Property Management division. The section is responsible for carrying out and implementing capital projects such as building construction, redevelopments, and life cycle replacement of equipment.
FIT	Feed-In Tariff Program. Developed by the Province of Ontario to encourage and promote greater use of renewable energy sources including on-shore wind, waterpower, renewable biomass, biogas, landfill gas and solar photovoltaic (PV) for electricity generating projects in Ontario. See http://fit.powerauthority.on.ca/fit-program for more information.
Fossil Fuel	A fuel (as coal, oil, or natural gas) formed in the earth from plant or animal remains.
GHG	See **Greenhouse Gas**

GHG Intensity	A measurement that essentially expresses a building's GHG emissions as a function of its size or other characteristics.
Green Energy Act	Formally **Bill 150,** the **Green Energy and Green Economy Act, 2009**, introduced in the Ontario legislature on February 23, 2009. It aims to expand renewable energy production, encourage energy conservation and create green jobs.
Green Power	Energy produced from renewable and non-hazardous technologies. Common sources of green power include solar, wind, geothermal, biogas, and low-impact hydroelectric.
Greenhouse Gas	Any of the atmospheric gases that contribute to the greenhouse effect by absorbing infrared radiation produced by solar warming of the Earth's surface. They include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (NO_2), and water vapour.
HVAC	**H**eating **V**entilation and **A**ir **C**onditioning.
Kilowatt	Unit on measurement for the rate of power use (the power at any instance in time). Commonly used on electricity bills to show the electrical demand. 1 kilowatt = 1,000 watts 1 megawatt = 1,000 kilowatt Can also be denoted as **kW**
Kilowatt Hour	A measurement of power used (commonly electricity) over a period of time. 1 kilowatt hour = 1,000 watt hours 1 megawatt hour = 1,000 kilowatt hours 1 kilowatt hour = 1 watt x 1,000 hour OR 500 watts x 2 hour2 OR 2,000 watt x ½ hour Can also be denoted as **kWh**
kW	See **Kilowatt**.
kWh	See **Kilowatt Hour**.

LED	Light Emitting Diode. An electronic device that emits light when an electrical current is passed through it. Modern LED lights are highly efficient (more light for less power) and have a long lifespan.
LEED	Leadership in Energy and Environmental Design. An ecology-oriented building certification program. Concentrates its efforts on improving performance across five key areas of environmental and human health: energy efficiency, indoor environmental quality, materials selection, sustainable site development and water savings.
m^3	See **Cubic Meter**.
Megawatt	1 Megawatt is equal to 1,000 kilowatts (see **Kilowatt**).
Megawatt Hour	1 Megawatt hour is equal to 1,000 kilowatt hours (see **Kilowatt Hour**).
MW	See **Megawatt**.
MWh	See **Megawatt Hour**.
Net-zero Carbon	Also called carbon neutral, refers to achieving net zero carbon emissions by balancing a measured amount of carbon released with an equivalent amount sequestered or offset.
Process	Organizational Energy Efficiency Measure, involving building an energy conservation culture. Examples: Turning off equipment at night, implementing start up and shut down schedules, etc.
Program	People Energy Efficiency Measure, involving awareness, habits, procedures and feedback. Examples: Training staff in energy awareness, Employee Participation Program-Identification of Improvements.
Project	Technological type Energy Efficiency Measure, involving operational and technological actions. Examples: Lighting retrofit, new controls, efficient boiler, etc.
Renewable Energy	Energy that comes from resources that are naturally replenished on a human timescale. Includes sunlight, wind, rain, tides, waves, and geothermal heat.

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 2019/05/14	Originator's files:
To: Chair and Members of General Committee	
From: Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer	Meeting date: 2019/06/26

Subject
Security in City Facilities, Properties and Transit - Strategic Directions and 2018 Annual Summary

Recommendation
That the Corporate Report titled "Security in City Facilities, Properties and Transit - Strategic Directions and 2018 Annual Summary", from the Commissioner of Corporate Services and Chief Financial Officer dated May 14, 2019 be received for information.

Report Highlights
- This report highlights the strategic direction and focus on Operational Excellence, Security Awareness, Community Outreach, and Security Infrastructure with supporting activities and initiatives for 2019.
- The Security Services key achievements in 2018 includes an emphasis on Performance Metrics, Staff Training, the Protective Measures Program, and Integration in community activities and partnerships.
- 2018 Security Services Incident and Graffiti reporting.

Background
The Security Services section within the Facilities and Property Management division is responsible for bylaw enforcement and security on most City properties including Transit. The section's mandate is to protect staff, customers and assets, by providing collaborative and proactive, risk-based security services to support the delivery of safe and reliable City services.

The source data utilized in this report comes from the section's Special Occurrence Reports (SORs). All Security incidents reported to, or responded to, by Security Services are documented as Special Occurrence Reports:

- Appendix 1 provides the total number of SORs issued within each Ward for a number of categories in 2018.
- Appendix 2 provides the number and reason for bans imposed under the Trespass to Property Act for 2018.
- Appendix 3 provides definitions for common security occurrences used by Security Officers when preparing SORs.
- Appendix 4 provides a breakdown of Graffiti Incidents reported in 2018.

The report provides the Chair and Members of General Committee with:

1. An overview of key strategic directions and 2019 security program initiatives.

2. A summary of key 2018 accomplishments.

3. Key security metrics.

4. A summary and analysis of graffiti incidents.

Comments

Part 1 – Key Strategic Directions and 2019 Security Program Initiatives

Security Services aims to become the centre of excellence in municipal security service delivery. Key strategic directions have been set and in 2019 initiatives will continue to concentrate on optimizing the service delivery model through security risk management and preventive program initiatives.

Security Services has three key areas of focus:

Operational Excellence

- Implement effective service delivery oversight and decision-making that will allow the Security Services section to grow and achieve its objectives.
- Enable the development and implementation of a City-Wide Security Policy.
- Further develop and implement continuous improvement initiatives, including the development of Standard Operating Procedures.
- Ensure effective implementation of a Training and Compliance unit with a focus on staff development.
- Implement further Security Occurrence Reporting improvements for better data analysis and staff efficiencies.

Security Awareness and Community Outreach

- Drive to move security initiatives from a reactive workforce to a proactive reduction of crime and community based enforcement.
- Maintain and build a security awareness program engaging communities and staff through town hall meetings, security awareness campaigns and active engagement.
- Continue implementation of the Protective Measures Program.
- Develop a Security Risk Methodology for the City of Mississauga to support key activities and actions based on a priority framework.

Security Infrastructure

- Maintain current infrastructure in a state of good repair with an effective maintenance plan.
- Continue the Physical Security Information Management System (formerly Integrated Security Systems) project that will enable an end-to-end incident and risk management solution.
- Implement City Hall Security improvements including maintaining and managing the City's access control and intrusion detection system.
- Improve frontline activities by increasing mobile patrols from two cars to four cars on the road as approved by Council in the 2019 operating budget.

Part 2 - 2018 Achievements

Security Services, in partnership with law enforcement and City staff, made a number of significant contributions to the safety of Mississauga in 2018 through the following actions.

Operational Excellence

Performance Metrics: Performance metrics have begun to provide a better understanding of the section's performance on response times, allowing more informed decisions related to resource allocation and priorities.

Security Response Times

Security response times were measured and reported on a monthly basis based on two target categories. Target response times were established based on industry standards in comparable urban environments.

Category 1 - Core Precinct

- Target: 95% of all calls for service to be responded to within 5 minutes or less.
- Actual 2018 response rate achieved: 90%.

Category 2 – All other City properties including parks and transit infrastructure

- Target: 95% of all calls for service to be responded to within 30 minutes or less.
- Actual 2018 response rate achieved: 87%.

Security Awareness and Community Outreach

Staff Training

In 2018, Security Services delivered training to 505 City staff. Training was focused on Personal Safety and Security Awareness (PSSA) and provides general information about staff roles & responsibilities and de-escalation techniques.

Security Awareness and Outreach

In 2018, Security Services attended 24 outreach events interacting with approximately 4000 members of the public.

In 2018 Security Services also launched the first phase of the security awareness signage program for City facilities and parks including the creation of signage guidelines in relation to City policies and accessibility standards; rebranding of Closed Circuit Video Signage and initiating a City-wide security signage audit.

Further efforts will be made in 2019 to increase public awareness about Security Services.

Protective Measures Program

Through the collaborative efforts of various City teams, the Protective Measures Policy was approved by Council on June 21st 2017. This policy aims to mitigate the risk of serious injury to City staff and the public in the event of an emergency situation at a City facility. The implementation of this program and associated training and plans will continue in 2019.

Increased Community and Partner Organization Integration

Crime prevention is optimized through a holistic, integrated and community based approach. Security Services has continued to increase integration with key community partners such as Peel Regional Police, Crime Prevention Through Environmental Design (CPTED) Advisory Committee, Integrated Municipal Enforcement Team (IMET) and various internal stakeholders.

Throughout 2018, Security Services presented at various Councillor Town Hall meetings on crime prevention with educational materials presented at community centres and recreation facilities. This has increased the overall understanding of the City-wide security environment and helped to identify areas of focus and concern.

Security Infrastructure

Security System Detection Rates

In 2018 a pilot project was completed to analyze the impact of nuisance alarms and identify opportunities for enhancement. The project resulted in a continuous improvement submission by reducing waste and maximizing officer efficiency. The results and subsequent changes saw an 80% reduction in nuisance alarms that equates to over 100 fewer alarms per day to address. The process is planned to be continued for 2019.

Physical Security Information Management System (formerly Integrated Security System)

The Physical Security Information Management System will be a unified, end-to-end incident and risk management solution that consolidates multiple physical security system platforms into a single interface. The feasibility study and design for short and long term solutions and roadmap is underway and expected to conclude by October 2019.

Video Requests

Video surveillance plays a key role in allowing Security Services and Peel Regional Police to keep the City safe. In 2018 the number of video requests totaled 477, which represents a 122% increase compared to 2017 (215 requests).

Part 3 – Security Incidents

Special Occurrence Reports (SORs)

In 2018 the total number of SORs decreased by 48% when compared to 2017. The most significant factor that contributed to this decline was a redesign of the security reporting process and a data quality review. Additional factors impacting the decrease include streamlined reporting criteria for graffiti, lost & found property reports and a simplified escalation processes for maintenance issues.

In early 2018, Security Services initiated a data quality and review of its incident reporting process and system following LEAN principles. As a result of the review non-security maintenance requests were re-directed and a new process was established which reduced the amount of paperwork officers were required to complete for minor/non-resultant security calls. The changes resulted in increased operational efficiency allowing security officers to stay on the road longer where they are most effective.

See Appendix 1 for details on the total number of SORs issued in 2018 within each Ward and for various categories.

Bans

Bans imposed under the Trespass to Property Act as detailed in Appendix 2, decreased from 275 in 2017 to 228 in 2018. The under 18 bans increased from 95 to 104. Security Services reserves bans for serious events and habitual offenders. For minor offenses the approach of inform, educate, and enforce is taken.

- First Inform: Advise that a violation has occurred and inquire as to the reasons why
- Then Educate: Explain the reason for the bylaw / policy and the role of the officer in enforcing the bylaw / policy
- Finally Enforce: Issue warning notices or infractions, as a last resort, depending on the situation and in keeping with the prescribed protocols

The aim is to continue this trend in 2019 with officer's interacting with patrons to establish and initiate an appropriate and proportional response to the situations, ensuring that prohibited activity ceases and/or the individual leaves the premises. Enabling the lawful enjoyment of City facilities and the continuity of business operations can be accomplished through "education" instead of "bans".

As per Corporate Policy No. 05-01-10, Responding to Incidents in City Facilities, when a ban is issued, a Special Occurrence Report and Supplementary Banning Report is created and distributed in compliance with the Municipal Freedom of Information and Protection of Privacy Act (MFIPPA).

Part 4 - Graffiti

Graffiti Incidents

There were 894 graffiti incidents reported in 2018. This is a 3% decrease from 2017 (925 incidents) and consistent with Peel Regional Police information of a decrease in reported graffiti incidents.

Summary of Graffiti Incidents and Service Level

Service Level is defined as the time established for graffiti removal in order of priority from 2 to 5 business days.

	2017	2018
Graffiti Incidents	925	894
Service Level Targets Achieved	74%	78%
Removal Costs	$117,576	$145,528

Further detail analysis can be found in Appendix 4

Graffiti tracking and mitigation efforts are included as part of the broader security awareness outreach programs - from measuring the effectiveness of prevention strategies for all security incidents as well as to increase collaboration with community groups (e.g. Safe City Mississauga), external stakeholders (e.g. Mississauga Integrated Municipal Enforcement Team (IMET)), etc.

Graffiti Removal

Service level targets improved compared to 2017. Total costs for graffiti removal increased slightly despite a decrease in graffiti reported. This increase can be attributed to a number of factors including: the amount of graffiti per report, weather (ice & snow) and challenges removing certain mediums used.

Incidents where service level targets were not achieved can be attributed to several factors including seasonal weather impacts, reporting system limitations and user training issues. Additional challenges meeting targets often arise when coordinating cleanup efforts with non-city entities such as utilities (e.g. graffiti on electrical box within a City park). Business lines (e.g. Works Operations & Maintenance, Parks Operations, Building Services & Operations, Transit Enforcement, Compliance & Licensing) will continue to refine these input processes to improve data fidelity for future reports.

Further details about graffiti incidents and removal statistics are found in Appendix 4.

Financial Impact

No financial impact.

Conclusion

Security Services will continue to optimize services through new program initiatives and continued enhancements throughout 2019. The Section will continue to focus on the highest quality of service to City staff and the public while delivering value added outcomes in an efficient and effective manner. The Security Services section is committed to taking a strategic approach that will emphasize proactive prevention through engagement and priority based improvement initiatives and activities.

Attachments

Appendix 1: 2018 Security Occurrence Reports
Appendix 2: 2018 Bans Under the Trespass to Property Act
Appendix 3: Security Occurrence Definitions
Appendix 4: 2018 Graffiti Incidents Summary

Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer

Prepared by: Silvia Fraser, Manager-Security Services, Facilities & Property Management

Facilities & Property Management Division

Security Services

Appendix 1

2018 Security Occurrence Reports (SOR's)

INCIDENT CATEGORIES	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	Ward 7	Ward 8	Ward 9	Ward 10	Ward 11	Buses & Bus Stops	Other	Grand Total
ACCIDENT	**13**	**1**	**4**	**50**	**15**	**17**	**5**	**6**	**13**	**0**	**1**	**43**	**8**	**176**
PERSONAL INJURY	4	1	3	31	6	1	3	2	2	0	0	1	0	54
PROPERTY DAMAGE	3	0	1	6	3	3	1	0	1	0	0	36	3	57
VEHICLE (PERSONAL INJURY)	0	0	0	1	0	0	0	1	1	0	0	3	2	8
VEHICLE (PROPERTY DAMAGE)	6	0	0	12	6	13	1	3	9	0	1	3	3	57
ALARM	**43**	**24**	**13**	**36**	**34**	**39**	**18**	**4**	**5**	**9**	**14**	**3**	**0**	**242**
GENERAL	42	24	10	31	27	37	17	3	5	8	14	3	0	221
DURESS	1	0	3	5	7	2	1	1	0	1	0	0	0	21
ASSAULT	**1**	**0**	**1**	**14**	**7**	**0**	**2**	**1**	**3**	**0**	**0**	**17**	**1**	**47**
BODILY	1	0	0	6	2	0	0	0	2	0	0	6	1	18
COMMON	0	0	0	6	5	0	2	1	1	0	0	6	0	21
SEXUAL	0	0	0	2	0	0	0	0	0	0	0	4	0	6
WEAPONS	0	0	1	0	0	0	0	0	0	0	0	1	0	2
DISTURBANCE	**96**	**37**	**41**	**287**	**149**	**42**	**47**	**62**	**52**	**14**	**35**	**281**	**6**	**1149**
DISPUTE : OPERATOR/PASSENGER	0	0	0	10	6	0	0	5	1	0	0	73	3	98
DISPUTE : PASSENGER/PASSENGER	1	0	0	4	0	0	0	1	0	0	0	15	0	21
DRUGS : MARIJUANA	5	2	2	36	7	2	0	1	0	1	1	1	0	58
DRUGS : OTHER	0	0	1	4	1	0	0	2	0	0	0	2	0	10
DRUNKENNESS	11	1	1	28	14	0	2	6	3	0	0	50	2	118
FIGHTING	0	0	1	11	13	0	0	2	1	0	0	1	0	29
HARASSMENT	5	2	3	13	2	3	2	3	9	3	0	5	0	50
INDECENT BEHAVIOUR	0	1	0	7	9	0	2	4	3	1	0	3	0	30
LIQUOR OFFENCE	6	1	3	27	8	0	4	1	1	1	1	5	0	58
MISCHIEF : (CITY PROPERTY) MISCHIEF OVER $5000	0	0	0	2	1	0	0	0	0	0	1	1	0	5
MISCHIEF : (CITY PROPERTY) MISCHIEF UNDER $5000	10	2	0	12	7	2	5	2	1	0	3	87	0	131

INCIDENT CATEGORIES	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	Ward 7	Ward 8	Ward 9	Ward 10	Ward 11	Buses & Bus Stops	Other	Grand Total
MISCHIEF : (NON-CITY PROPERTY) MISCHIEF UNDER $5000	1	0	0	1	1	2	0	0	0	0	0	1	0	6
MISCHIEF : MISCHIEF ENDANGER LIFE	1	0	0	0	0	0	0	0	0	1	1	1	0	4
NOISE	1	0	0	7	5	0	3	0	1	0	0	5	0	22
OFFENSIVE MATERIAL	1	0	0	0	0	0	1	0	0	0	0	0	0	2
OFFENSIVE MATERIAL : HATE	0	0	0	1	0	0	0	0	0	0	0	0	0	1
POSSESSION OF A WEAPON	0	0	0	3	1	0	0	1	0	0	0	1	0	6
PROHIBITED ACTIVITY : BY-LAW INFRACTION	21	8	11	23	15	9	10	6	5	6	11	4	0	129
PROHIBITED ACTIVITY : ENTER/REMAIN AFTER CLOSING	12	9	0	5	5	11	5	2	2	0	3	0	0	54
PROHIBITED ACTIVITY : FAIL TO COMPLY WITH ORDER BY STAFF	2	1	2	6	10	0	0	4	1	0	1	0	0	27
PROHIBITED ACTIVITY : OPERATE/USE SOUND AMPLIFICATION EQUIPMENT	0	0	0	1	0	0	0	1	0	0	0	0	0	2
PROHIBITED ACTIVITY : PERMIT DISPUTE	0	2	0	0	0	0	0	1	1	0	2	0	0	6
PROHIBITED ACTIVITY : VIOLATE RESPECTFUL WORKPLACE POLICY	1	1	6	15	13	3	3	4	5	0	1	0	0	52
PROHIBITED ACTIVITY : VIOLATION OF FACILITY RULES	7	2	5	31	19	5	5	8	8	1	3	1	1	96
SOLICITING	0	0	0	8	1	0	0	0	0	0	0	0	0	9
SUSPICIOUS ACTIVITY	10	5	6	23	8	5	3	5	6	0	6	2	0	79
SUSPICIOUS PACKAGE	0	0	0	4	0	0	1	0	0	0	0	2	0	7
UNAUTHORIZED ADVERTISING	1	0	0	3	0	0	0	2	1	0	0	13	0	20
UTTERING THREATS	0	0	0	2	3	0	1	1	3	0	1	8	0	19
EMERGENCY/911	**6**	**3**	**8**	**25**	**6**	**3**	**2**	**2**	**3**	**2**	**5**	**0**	**0**	**65**
BOMB THREAT	0	0	0	1	0	0	0	0	0	0	0	0	0	1
FATALITY ON PREMISE	1	2	0	0	0	0	0	0	0	0	0	0	0	3
GAS LEAK	0	0	0	0	0	0	1	0	1	0	1	0	0	3
HOLD & SECURE	0	0	0	0	1	0	0	0	0	0	0	0	0	1
MISSING PERSON : FOUND	0	0	0	6	0	0	0	0	0	0	0	0	0	6
MISSING PERSON : REPORTED	0	0	0	0	0	0	0	1	1	0	0	0	0	2
PERSON(S) TRAPPED (ELEVATOR)	0	0	7	3	3	0	0	0	0	0	0	0	0	13
SMOKE/FIRE	5	1	1	15	2	3	1	1	1	2	4	0	0	36
FRAUD	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**4**
FRAUD	0	0	0	3	0	0	0	0	0	0	0	0	1	4

INCIDENT CATEGORIES	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	Ward 7	Ward 8	Ward 9	Ward 10	Ward 11	Buses & Bus Stops	Other	Grand Total
GRAFFITI	**4**	**2**	**1**	**17**	**0**	**1**	**1**	**2**	**2**	**0**	**0**	**20**	**0**	**50**
CITY PROPERTY : GANG	1	0	0	2	0	0	0	0	0	0	0	0	0	3
CITY PROPERTY : HATE	2	1	0	3	0	0	0	1	0	0	0	6	0	13
CITY PROPERTY : OFFENSIVE	0	0	0	1	0	0	0	0	1	0	0	1	0	3
CITY PROPERTY : OTHER	0	0	0	2	0	0	0	0	0	0	0	2	0	4
CITY PROPERTY : TAGGING	1	1	1	9	0	1	1	1	1	0	0	10	0	26
NON-CITY PROPERTY : HATE	0	0	0	0	0	0	0	0	0	0	0	1	0	1
MEDICAL	**2**	**0**	**3**	**116**	**10**	**6**	**1**	**3**	**2**	**0**	**0**	**41**	**3**	**187**
MEDICAL	2	0	3	116	10	6	1	3	2	0	0	41	3	187
ROBBERY	**0**	**0**	**0**	**6**	**3**	**0**	**0**	**1**	**1**	**0**	**0**	**3**	**0**	**14**
ROBBERY	0	0	0	6	3	0	0	1	1	0	0	3	0	14
THEFT	**3**	**1**	**5**	**42**	**41**	**7**	**12**	**10**	**17**	**3**	**1**	**4**	**0**	**146**
(CITY PROPERTY) OVER $5000	0	0	0	0	0	1	0	1	0	0	1	0	0	3
(CITY PROPERTY) UNDER $5000	0	0	2	10	9	4	1	0	0	1	0	3	0	30
(NON CITY PROPERTY) OVER $5000	0	0	1	4	1	0	2	1	2	0	0	0	0	11
(NON CITY PROPERTY) UNDER $5000	2	1	1	22	15	0	4	1	9	2	0	1	0	58
ATTEMPTED	1	0	0	3	0	0	0	1	2	0	0	0	0	7
BICYCLE	0	0	1	2	13	0	1	1	1	0	0	0	0	19
LOCKER	0	0	0	1	3	2	4	5	3	0	0	0	0	18
TRANSIT	**3**	**3**	**31**	**132**	**58**	**4**	**1**	**70**	**10**	**0**	**0**	**88**	**2**	**402**
ASSIST PASSENGER	1	2	2	41	8	3	1	9	4	0	0	63	2	136
BRING UNMUZZLED DOG ON TRANSIT PROPERTY	0	0	0	1	0	0	0	0	0	0	0	3	0	4
FARE OFFENCE : RIDE BUS W/O TENDERING FARE	0	0	0	3	1	0	0	1	1	0	0	4	0	10
FARE OFFENCE : USE INVALID/EXPIRED PASS/TICKET	0	0	0	1	0	0	0	0	1	0	0	2	0	4
FARE OFFENCE : USE UNAUTHORIZED PASS/TICKET/TRANSFER	1	0	0	5	0	0	0	9	0	0	0	1	0	16
INTERFERE WITH BUS OPERATION	1	1	0	5	3	0	0	3	0	0	0	4	0	17
PEDESTRIAN ON TRANSITWAY	0	0	16	5	10	0	0	5	0	0	0	3	0	39
SMOKING ON TRANSIT PROPERTY	0	0	1	9	1	0	0	0	0	0	0	1	0	12
SMOKING ON TRANSIT PROPERTY : MARIJUANA	0	0	0	2	0	0	0	0	0	0	0	0	0	2
UNAUTHORIZED VEHICLE ON TRANSIT PROPERTY	0	0	0	51	24	1	0	40	4	0	0	6	0	126

INCIDENT CATEGORIES	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	Ward 7	Ward 8	Ward 9	Ward 10	Ward 11	Buses & Bus Stops	Other	Grand Total
UNAUTHORIZED VEHICLE ON TRANSITWAY	0	0	12	9	11	0	0	3	0	0	0	1	0	36
TRESPASSING	**3**	**2**	**8**	**21**	**12**	**2**	**2**	**0**	**1**	**2**	**2**	**0**	**0**	**55**
FORCED ENTRY	2	1	0	2	2	0	0	0	0	1	2	0	0	10
FORCED ENTRY (ATTEMPTED)	1	0	0	0	0	0	0	0	0	0	0	0	0	1
TRESPASSER ON SITE (BANNED PERSON)	0	1	8	19	10	2	2	0	1	1	0	0	0	44
Grand Total	**174**	**73**	**115**	**749**	**335**	**121**	**91**	**161**	**109**	**30**	**58**	**500**	**21**	**2537**

Facilities & Property Management Division

Appendix 2

Security Services

2018 Bans Under the Trespass to Property Act

REASON FOR BAN	2018 Under 18	2018 Total
ASSAULT : BODILY	1	4
ASSAULT : SEXUAL	0	2
DISTURBANCE : DISPUTE : PASSENGER/PASSENGER	0	1
DISTURBANCE : DRUGS : MARIJUANA	23	52
DISTURBANCE : DRUGS : OTHER	0	6
DISTURBANCE : DRUNKENNESS	0	5
DISTURBANCE : FIGHTING	11	15
DISTURBANCE : HARASSMENT	0	6
DISTURBANCE : INDECENT BEHAVIOUR	1	4
DISTURBANCE : LIQUOR OFFENCE	0	8
DISTURBANCE : MISCHIEF : (CITY PROPERTY) MISCHIEF OVER $5000	8	8
DISTURBANCE : MISCHIEF : (CITY PROPERTY) MISCHIEF UNDER $5000	5	6
DISTURBANCE : NOISE	0	1
DISTURBANCE : OFFENSIVE MATERIAL : HATE	0	1
DISTURBANCE : PROHIBITED ACTIVITY : BY-LAW INFRACTION	7	11
DISTURBANCE : PROHIBITED ACTIVITY : ENTER/REMAIN AFTER CLOSING	0	7
DISTURBANCE : PROHIBITED ACTIVITY : FAIL TO COMPLY WITH ORDER BY STAFF	10	13
DISTURBANCE : PROHIBITED ACTIVITY : VIOLATE RESPECTFUL WORKPLACE POLICY	13	19
DISTURBANCE : PROHIBITED ACTIVITY : VIOLATION OF FACILITY RULES	10	18
DISTURBANCE : SOLICITING	0	1
DISTURBANCE : UTTERING THREATS	0	2
GRAFFITI : CITY PROPERTY : HATE	0	1
GRAFFITI : CITY PROPERTY : OTHER	1	2
THEFT : (NON CITY PROPERTY) UNDER $5000	0	1
THEFT : ATTEMPTED	1	1
THEFT : LOCKER	1	1
TRANSIT : INTERFERE WITH BUS OPERATION	0	1
TRANSIT : SMOKING ON TRANSIT PROPERTY	0	1
TRESPASSING : FORCED ENTRY	7	10
TRESPASSING : TRESPASSER ON SITE (BANNED PERSON)	6	20
Total 2018	**105**	**228**

Facilities & Property Management Division **Appendix 3**
Security Services

Security Occurrence Definitions

Category	Definition
ACCESS : DENIED	Substantiation and justification of denial of access to a contractor or staff member.
ACCIDENT : PERSONAL INJURY	Any personal injury where city staff/facility/or action or inaction may have caused the injury
ACCIDENT : PROPERTY DAMAGE	Any accident that damages City Property - Not including any person
ACCIDENT : VEHICLE (PERSONAL INJURY)	Any accident involving a vehicle and a person, where the person was injured (1staid +)
ACCIDENT : VEHICLE (PROPERTY DAMAGE)	Any accident that damages city assets that involves a vehicle
ALARM : GENERAL	Incidents where security responds to facility (not duress) alarms and must take action to disarm or reset
ALARM : DURESS	Incidents where a duress alarm is activated (eg code blue station or panic button)
ASSAULT : BODILY	An assault that causes bodily harm to a person.
ASSAULT : COMMON	An assault that does not result in a serious injury, ie pushing someone.
ASSAULT : SEXUAL	Sexual assault is defined as sexual contact with another person without that other person's consent.
ASSAULT : WEAPONS	An assault committed using a weapon.
DISTURBANCE : DISPUTE : OPERATOR/PASSENGER	A dispute between a Transit Operator and a passenger causing a disturbance.
DISTURBANCE : DISPUTE : PASSENGER/PASSENGER	A dispute between two passengers on Transit property causing a disturbance.
DISTURBANCE : DRUGS : MARIJUANA	Persons using or impaired by marijuana
DISTURBANCE : DRUGS : OTHER	Persons using or impaired by drugs
DISTURBANCE : DRUNKENNESS	Persons using or impaired by alcohol
DISTURBANCE : FIGHTING	Persons who have consented to a fight
DISTURBANCE : HARASSMENT	Persons engaging in pattern of conduct that causes another person to reasonably fear for their safety or others around them
DISTURBANCE : INDECENT BEHAVIOUR	Behaviour that is deemed to be insulting or offensive and may include indecent exposure of genitals
DISTURBANCE : LIQUOR OFFENCE	Person consuming alcohol in a facility or park without a permit
DISTURBANCE : MISCHIEF : MISCHIEF OVER $5000	The intentional damage of property, excluding graffiti, over $5000 in damages.
DISTURBANCE : MISCHIEF : MISCHIEF UNDER $5000	The intentional damage of property, excluding graffiti, under $5000 in damages.
DISTURBANCE : MISCHIEF : MISCHIEF ENDANGER LIFE	Any person who destroys or damages property that causes actual danger to life.
DISTURBANCE : NOISE	Persons creating excessive noise resulting in a disturbance to others. Eg. Students yelling in a library study zone. Does not include sound amplification equipment.
DISTURBANCE : OFFENSIVE MATERIAL	Distribution of material deemed to be offensive (explicit images/words) excluding hate material
DISTURBANCE : OFFENSIVE MATERIAL : HATE	Distribution of material deemed to be targeting identifiable groups
DISTURBANCE : POSSESSION OF A WEAPON	A person who carries or possesses a weapon, an imitation of a weapon, a prohibited device or any ammunition or prohibited ammunition for a purpose dangerous to the public peace or for the purpose of committing an offence.
DISTURBANCE : PROHIBITED ACTIVITY : BY-LAW INFRACTION	Any other By Law infraction the specifics of which are to be detailed in the SOR

DISTURBANCE : PROHIBITED ACTIVITY : ENTER/REMAIN AFTER CLOSING	A person who is not authorized to be in a park or facility after normal operating hours have ended
DISTURBANCE : PROHIBITED ACTIVITY : FAIL TO COMPLY WITH ORDER BY STAFF	A person who has not complied with directions issued by city staff
DISTURBANCE : PROHIBITED ACTIVITY : OPERATE/USE SOUND AMPLIFICATION EQUIPMENT	A person or persons engaged in the use of sound amplification equipment who do not have a permit to do so
DISTURBANCE : PROHIBITED ACTIVITY : PERMIT DISPUTE	A person, or persons engaged in a dispute surrounding a permitted space, or activity
DISTURBANCE : PROHIBITED ACTIVITY : VIOLATE RESPECTFUL WORKPLACE POLICY	A person who has violated the respectful workplace policy who is not city staff
DISTURBANCE : PROHIBITED ACTIVITY : VIOLATION OF FACILITY RULES	A person who does not comply with the rules of a facility
DISTURBANCE : SOLICITING	A person requesting or attempting to sell goods/services without a permit
DISTURBANCE : SUSPICIOUS ACTIVITY	A person or event which is deemed suspicious in nature
DISTURBANCE : SUSPICIOUS PACKAGE	An item which is out of place, unusual in nature or suspected of being an explosive device
DISTURBANCE : UNAUTHORIZED ADVERTISING	Advertising on City property that has not been authorized, i.e. flyers taped to shelters or library doors.
DISTURBANCE : UTTERING THREATS	A person who, in any manner, utters, conveys or causes any person to receive a threat. Includes gestures such as hand motions.
EMERGENCY/911 : BOMB THREAT	Threat of a bomb on City property
EMERGENCY/911 : FATALITY ON PREMISE	A fatality on City property
EMERGENCY/911 : GAS LEAK	A gas leak on City property
EMERGENCY/911 : HOLD & SECURE	A hold & secure event issued by (police, security or City staff) in response to a threat
EMERGENCY/911 : MISSING PERSON : FOUND	Missing person located
EMERGENCY/911 : MISSING PERSON : REPORTED	Missing person reported
EMERGENCY/911 : PERSON(S) TRAPPED (ELEVATOR)	Person(s) trapped in elevator
EMERGENCY/911 : SMOKE/FIRE	Any report of smoke/fire
FRAUD	Falsified or forged fare media, attempts to solicit funds from city staff or patrons through illegitimate means
GRAFFITI : GANG	Used by Gangs to mark territory
GRAFFITI : HATE	Conveys political messages, racial, religious or ethnic slurs
GRAFFITI : OFFENSIVE	Drawings, messages, etc. that are explicit and/or obscene.
GRAFFITI : MURAL	A very large image, such as a painting or enlarged photograph
GRAFFITI : OTHER	Does not fit any of the above
GRAFFITI : TAGGING	Use of Repeated use of a symbol or a series of symbols that acts as a signature
MEDICAL	Any injury requiring 1st Aid and/or Evacuation by ambulance for a party - where city assets are not suspected as the cause

Facilities & Property Management Division **Appendix 3**
Security Services

ROBBERY	Theft with the threat of violence and/or with a weapon
THEFT : OVER $5000	Theft of property over $5000
THEFT : UNDER $5000	Theft of property under $5000
THEFT : ATTEMPTED	An unsuccessful effort to commit a theft. Ie, person interrupted while trying to break in to a locker.
THEFT : BICYCLE	The illegal removal of a bicycle
THEFT : LOCKER	Theft from a locker
TRANSIT : ASSIST PASSENGER	Any sort of informational or physical assistance worthy of capture in a report to a passenger
TRANSIT : BRING UNMUZZLED DOG ON TRANSIT PROPERTY	Bring un-muzzled dog on Transit property. Note that service dogs are exempt from this requirement.
TRANSIT : FARE OFFENCE : RIDE BUS W/O TENDERING FARE	Failure to tender fare
TRANSIT : FARE OFFENCE : USE INVALID/EXPIRED PASS/TICKET	Use of invalid/expired pass/ticket
TRANSIT : FARE OFFENCE : USE UNAUTHORIZED PASS/TICKET/TRANSFER	Use of unauthorized pass/ticket/transfer
TRANSIT : INTERFERE WITH BUS OPERATION	Interfering with the operation of a bus or the Operator
TRANSIT : PEDESTRIAN ON TRANSITWAY	Pedestrian on Transitway
TRANSIT : SMOKING ON TRANSIT PROPERTY	Smoking on Transit property including buses, shelters and stations. Does not include Marijuana.
TRANSIT : SMOKING ON TRANSIT PROPERTY : MARIJUANA	Smoking Marijuana on Transit property including buses, shelters and stations.
TRANSIT : UNAUTHORIZED VEHICLE ON TRANSIT PROPERTY	Unauthorized vehicle on transit property excluding the Transitway
TRANSIT : UNAUTHORIZED VEHICLE ON TRANSITWAY	Unauthorized vehicle on transit way
TRESPASSING : FORCED ENTRY	Persons successful in entering a City property by force
TRESPASSING : FORCED ENTRY (ATTEMPTED)	Persons unsuccessful in entering a City property by force
TRESPASSING : TRESPASSER ON SITE	Unauthorized persons found on City property however not by forced entry. May include persons who have been banned from a property/facility.

2018 Graffiti Incidents

There were 894 reported graffiti incidents in 2018 representing a 3% decline compared to 2017's total of 925.

Incidents by Location

The total numbers of incidents by location are listed in the table below:

Graffiti Incidents by Location		
Location	**Total # of Incidents**	**Total % of Incidents**
City Road Allowances*	466	52%
City Parks	254	28%
City Properties	81	9%
Bus Shelters	42	5%
Private Property	51	6%
TOTAL	**894**	100%

*City road allowances include utility, communication and postal companies' property and equipment.

Incidents by Ward

The following table provides the total number of graffiti incidents by ward:

Graffiti Incidents by Ward		
Ward	**2017 Incidents (% of Total)**	**2018 Incidents (% of Total)**
1	10%	13%
2	5%	8%
3	11%	5%
4	8%	18%
5	3%	3%
6	3%	3%
7	4%	8%
8	5%	3%
9	14%	10%
10	8%	11%
11	2%	5%
Unreported*	28%	14%

**Note: Because roads span across multiple wards, the graffiti tracking system is unable to attribute wards to most city road allowance incidents.*

Incidents by Graffiti Types

The following table provides the breakdown of the graffiti incidents by type:

Graffiti Incidents by Type		
Type	**Number of Incidents**	**%**
Inoffensive	427	48%
Tagging	379	42%
Offensive	18	2%
Gang	8	<1%
Hate	7	<1%
Mural	4	<1%
Not Reported	51	6%
TOTAL	**894**	**100%**

Definitions of Graffiti Types

Type of Graffiti	Description	Removal Service Level
Hate	Conveys political messages, racial, religious or ethnic slurs	Within 2 business days
Offensive	Drawings, messages, etc. that are obscene, lewd or indecent	Within 2 business days
Tagging	Repeated use of a symbol or initials	Within 5 business days
Gang	Markings associated with gangs or to mark territory	Within 5 business days
Mural	Large images, such as a paintings or designs, resembling intricate artwork	Within 5 business days
Inoffensive	Drawings or markings or messaging that deface property	Within 5 business days

Note: There is no nationally recognized standard for graffiti classification; however the above types are consistent with other municipalities and law enforcement agencies in the Region of Peel as well as the Greater Toronto Area.

Graffiti Removal Targets

- Hate – removal within 2 business days
- Offensive – removal within 2 business days
- Gang – removal within 5 business days
- Tagging – removal within 5 business days
- Mural – removal within 5 business days
- Inoffensive –removal within 5 days

The following is a breakdown of the 2017 service level targets by location:

Graffiti SLA Targets by Location			
Location	Total # of Incidents	SLA Target Achieved	%
City Road Allowances	466	339	73%
City Parks	254	222	87%
City Properties	81	76	94%
Bus Shelters	42	20	48%
Private Property	51	N/A*	N/A*
TOTAL	**894**	657	**78%**

**Note: Service levels for removal of graffiti from private property is based on the Property Standards By-law specifications, which are different from the service levels set for City owned properties.*

Notifications of graffiti incidents are now forwarded directly to the business unit responsible for removal:

Business Unit/Division	**Graffiti Location**
Works Operations and Maintenance	• City Road Allowances • Utility & Communication Companies' property or equipment • Canada Post property
Parks Operations	City Parks
Building Services and Operations	City Buildings
Transit Enforcement	Bus Shelters
Compliance and Licensing	Private Property

Removal Costs

In 2018, the total cost for graffiti removal was $145,528. This included both contracted vendors as well as labour costs.

The total cost for contracted vendor graffiti removal services was $92,508:

Graffiti Removal Costs: Contracted Vendor	
Location	**Cost**
City Road Allowance and City Parks	$88,383
City Properties	$4,125
TOTAL	**$92,508**

The total staff labour cost associated with graffiti removal was $53,020:

Graffiti Removal Costs: Staff Labour	
Unit	**Cost**
Parks Operations	$6,636
Works Operations	$45,734
Facilities Operations	$650
TOTAL	**$53,020**

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 2019/06/07	Originator's files:
To: Chair and Members of General Committee	
From: Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer	Meeting date: 2019/06/26

Subject
Smart City Master Plan Update

Recommendation
1. That the report of the Commissioner of Corporate Services and Chief Financial Officer dated June 7, 2019 and entitled Smart City Master Plan be received for information.

2. That the Smart City Master Plan included as Appendix 1 in the report from the Commissioner of Corporate Services and Chief Financial Officer dated June 7, 2019 and entitled Smart City Master Plan be endorsed.

Background
On July 5, 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 focused 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 Smart City Master Plan (SCMP) was prepared in consultation with internal and external key stakeholders with the objective to create a ten 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 with 30 public engagement events, 18 pop-up events in City libraries and 800,000 points of contact through social media. Through the Smart Cities Challenge and Master Plan consultations with over 100 meetings with BIA's, Board of Trade, Rotary Club, Accessibility Advisory Committee, United Way, Sheridan College, University of Toronto, OCAD and many in person Industry meetings.

Comments

The development of the Smart City Master Plan is an important opportunity for the City of Mississauga to reflect, assess and understand the strategies and actions required to firmly establish the city as a Smart City leader globally.

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 along with online services to the integration of technology into the public realm. This is a fundamental change and is the driving force behind the Smart City movement with the following key issues supporting the need to manage in a new way:

- 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 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.

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.

The Smart City Master Plan, as attached in Appendix 1, includes the following:

- Introduction
- Executive Summary
- Smart City Overview
- Smart City Direction
- Implementation
- Next Steps
- Conclusion
- Appendix

The Smart City Master Plan vision statement is inclusive focusing on people, place and a better quality of life:

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!

The Smart City Direction includes a set of Goals that will be used to measure progress along with benchmarking through the ISO Standard 37122 for Smart Cities which will provide credible and consistent benchmarking with cities from around the world.

Smart City Goals

- **Focus on People**: Smart City projects are Inclusive, Embrace Creativity & Innovation and create opportunities for Social Resilience and Digital Literacy.
- **Focus on Economy**: Smart City projects enable Local & GlobalInterconnectedness, Entrepreneurship & Innovation, Economic Opportunity and work towards Procurement.
- **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.

Three key strategies provide direction and a series of actions that will enable the City of Mississauga to continue its digital transformation to create a connected and engaged City.

Smart City Strategies

- Mississauga is a City of the Future – This Strategy will help direct the future of large scale projects across the City.
- Mississauga is a Place for Civic Curiosity – This Strategy will provide the engagement opportunities for people and business as we build a Smart City together.
- Mississauga is a Smart City for Everybody – This Strategy will ensure that the city we are building is inclusive and helps support all Mississaugans.

A new Smart City Framework will provide the mechanisms to assess opportunities through the lifecycle replacement of technologies through Innovation Challenges. Existing partnerships will be strengthened and new ones will be formed through collaboration and engagement in the Centre for Civic Curiosity and through pilot projects in the City of Mississauga's Living Labs. Having a defined governance model and policy framework in place will ensure that the City is inclusive and engages the public, industry and other agency partners in determining the application of technology in the built environment and respecting the use of data and privacy.

The Smart City Master Plan provides a ten year vision and supporting framework that will enable the City of Mississauga to become a connected and engaged City, a Smart City for Everybody.

Financial Impact

The primary process and approvals for Smart City initiatives moving forward will be Business Planning and Budget. Any items related to Life Cycle will be planned with the Smart City Lens applied to incorporate the adoption of innovation and leading technologies.

Through the 2020 Business Plan and Budget a business case has been prepared to support the implementation of the Smart city Master Plan including a Project Leader and a capital Innovation Fund of $150,000 annually to support up to four Innovation Challenges on an annual basis which will fund professional services and technologies for small Smart City pilot projects.

Conclusion

The City has been a leader in implementing Smart City initiatives and made a great submission to the Smart Cities Challenge. Although we were not successful in this round, we are well positioned for other funding opportunities and for the next two challenges scheduled.

The Smart City Master Plan has been created with the input of citizens, businesses and our agency partners supported by research, benchmarking and internal stakeholder meetings. Strategic alignment has been central to key aspects of the plan with the Smart City Goals and Framework linked tightly to the City's strategic plan, master plans and business planning and budget processes. A good balance of continuous improvement and innovation has been

developed through the Smart City Master Plan strategies with Living Labs, Innovation Challenges and the Centre for Civic Curiosity, all designed with people and place in mind with technology being the enabler. The public engagement provided an opportunity to socialize the concepts and gather any input from the public and industry prior to finalizing the Smart City Master Plan.

We are well positioned with the endorsement of the Smart City Master Plan that will help inform future decisions, investments and partnerships.

Attachments

Appendix 1: Smart City Master Plan Executive Summary
Appendix 2: Smart City Master Plan

G. Kent.

Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer

Prepared by: Shawn Slack, Director Information Technology and Chief Information Officer

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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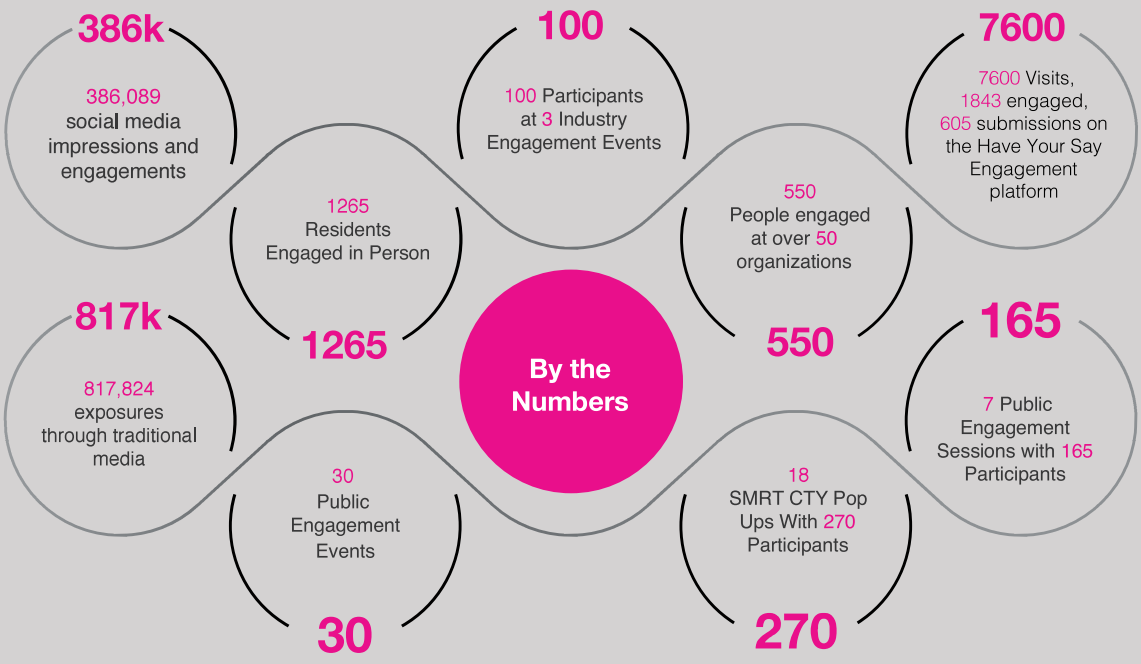

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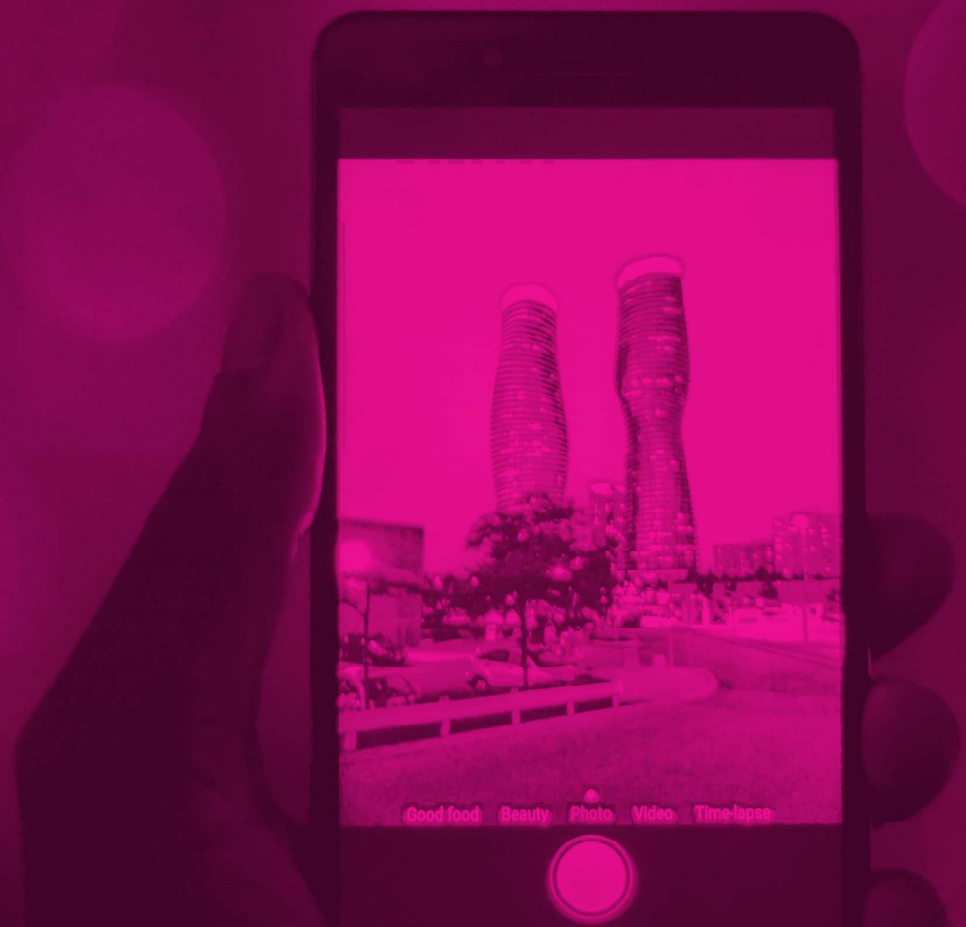

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Mississauga's Smart City includes digital initiatives such as Wireless Mississauga (free public Wi-Fi); digital services through the city's website, apps and other platforms; computer access and Maker Spaces at our libraries; and many other tools and 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.

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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.

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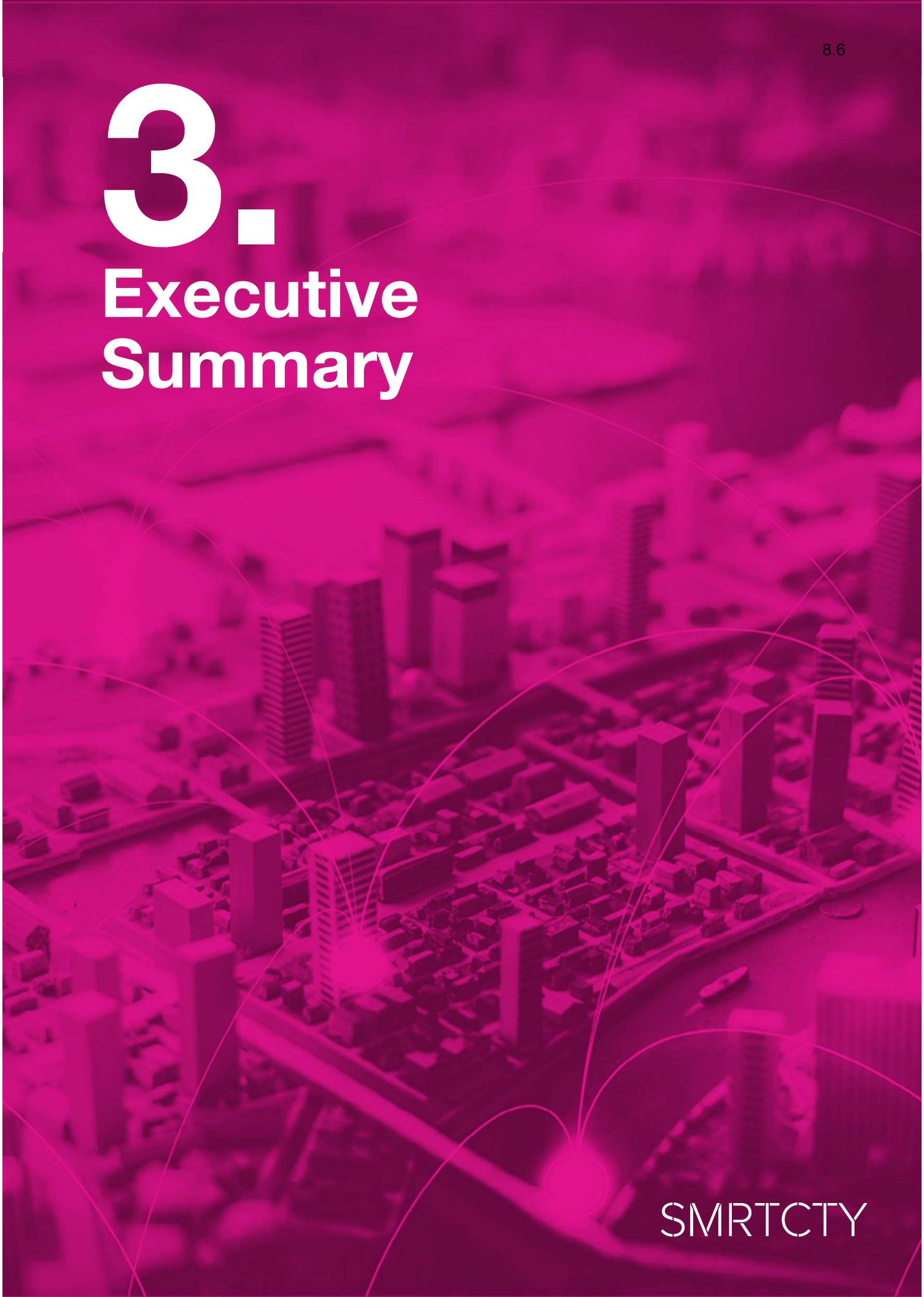
3. Executive Summary



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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.

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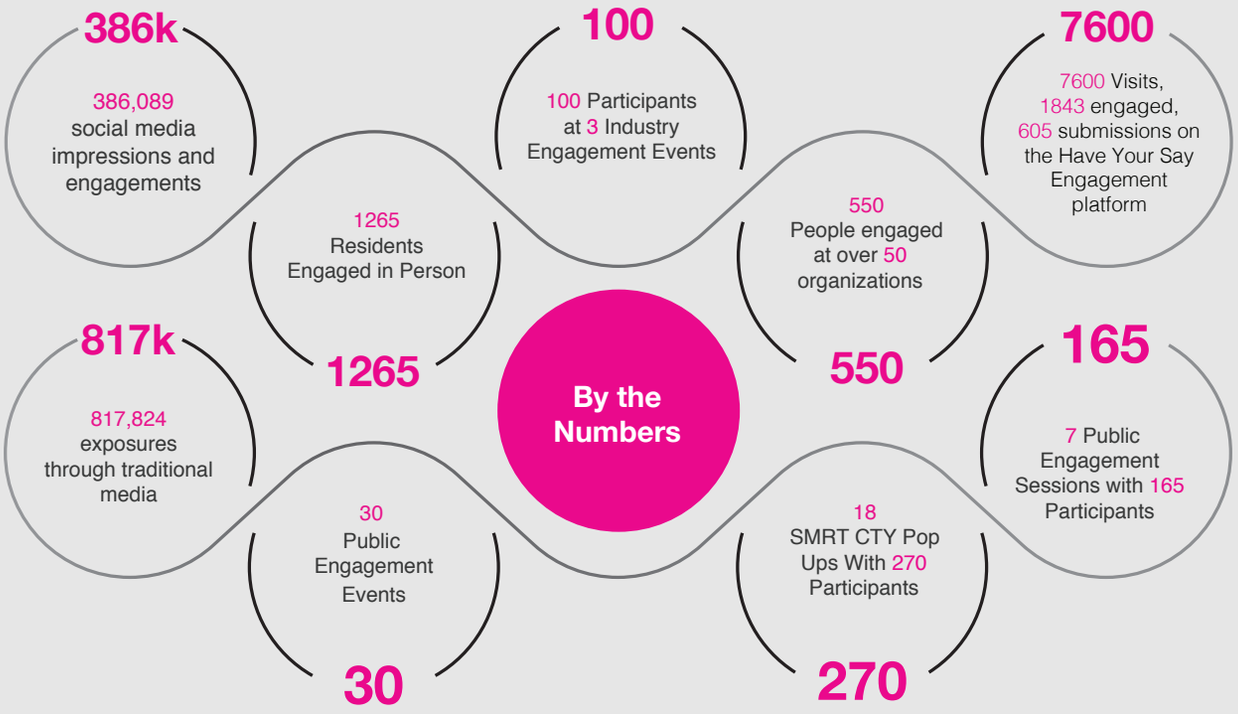

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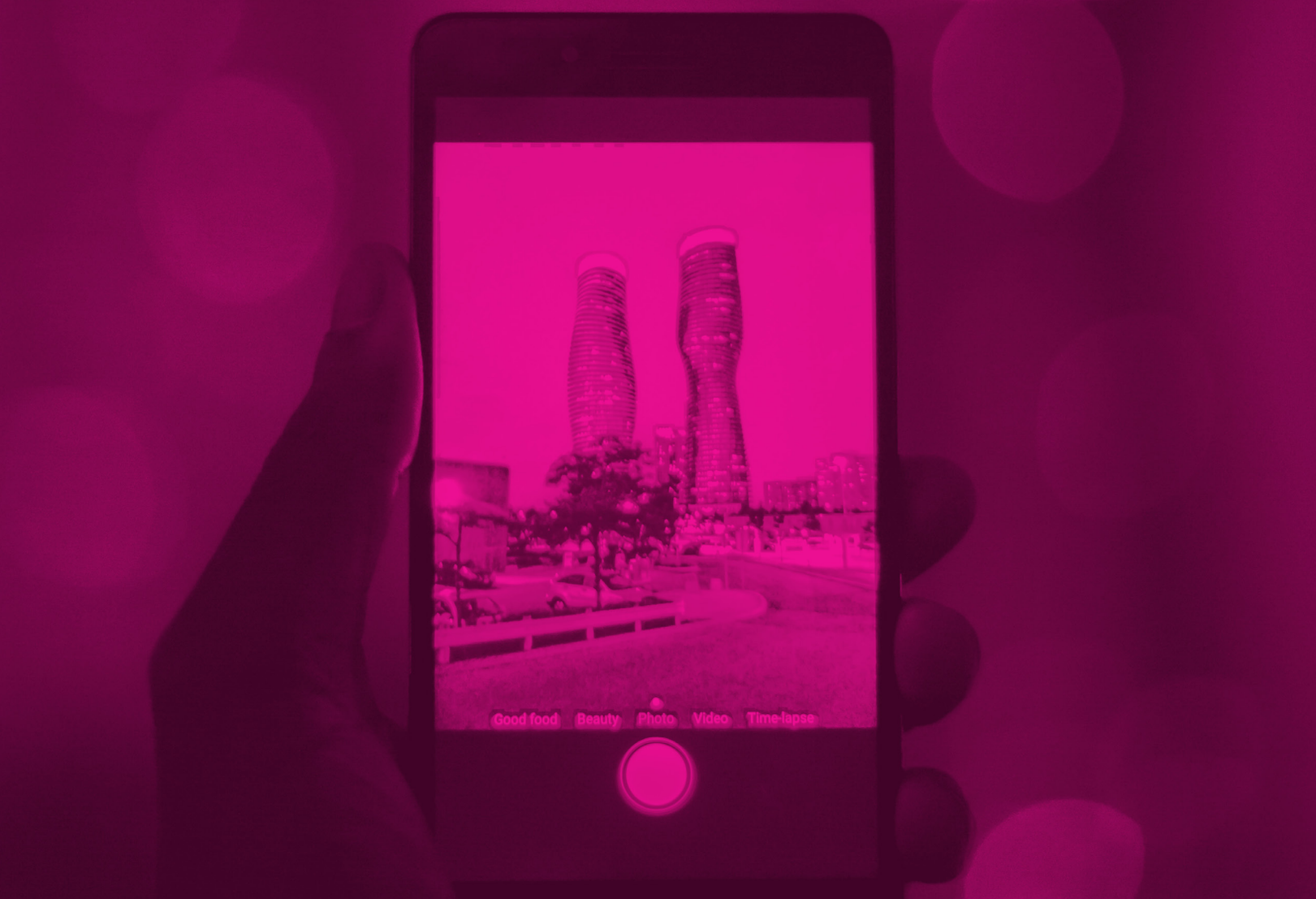

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Public Engagement

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.

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

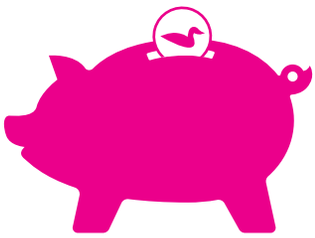
DIGITAL STATISTICS

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

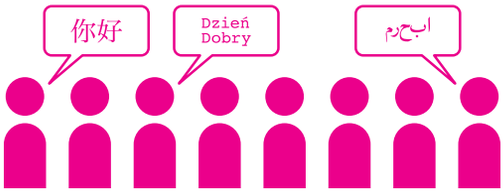
Newcomers between 2011 & 2016

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.

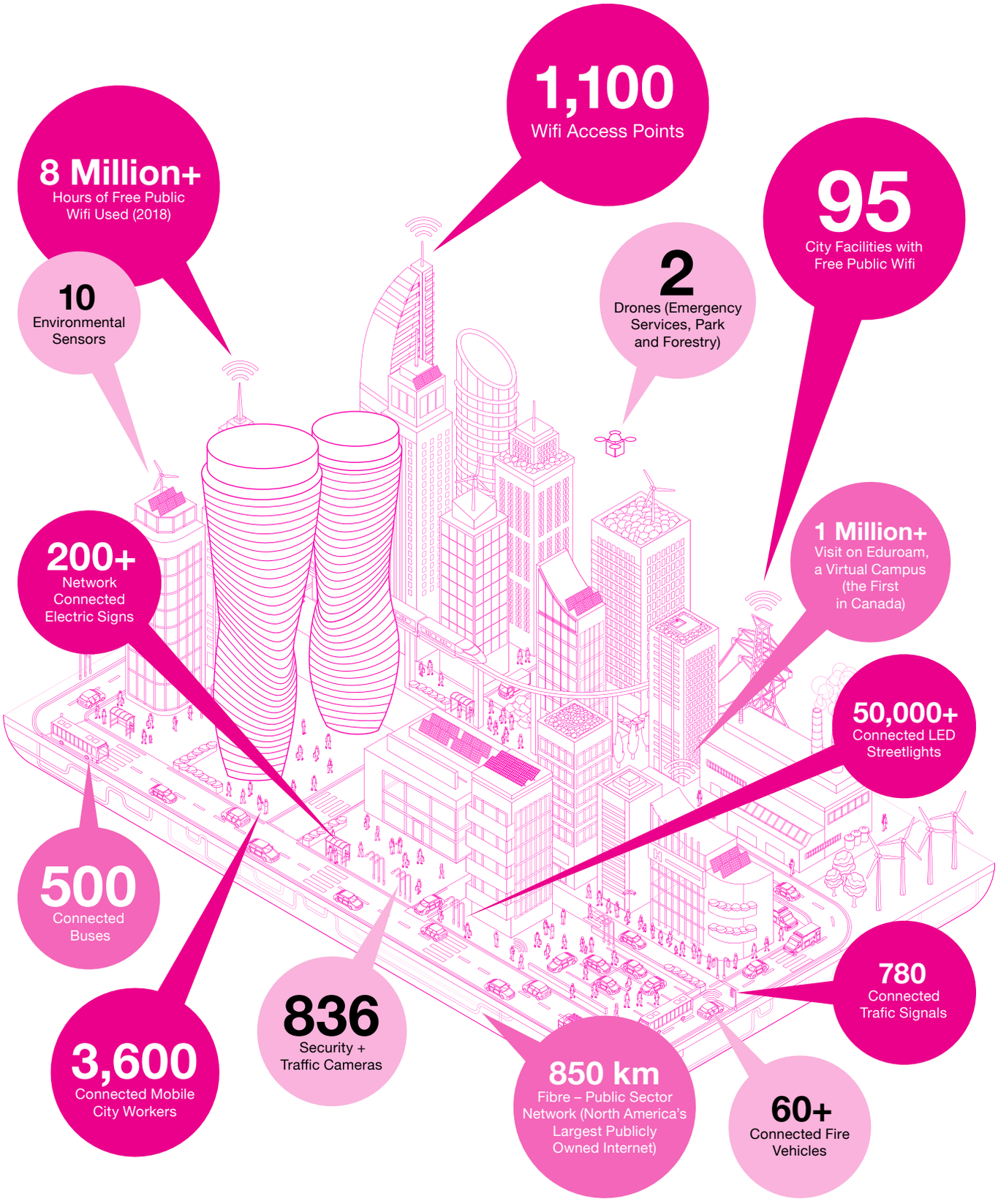
As a young city, Mississauga has had an opportunity to build technology into our infrastructure, systems and processes in tandem with the rise of digital technology in our society. Mississauga is, in many ways, already a 'smart city'. This digital ecosystem ensures that all of Mississauga's neighbourhoods 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...



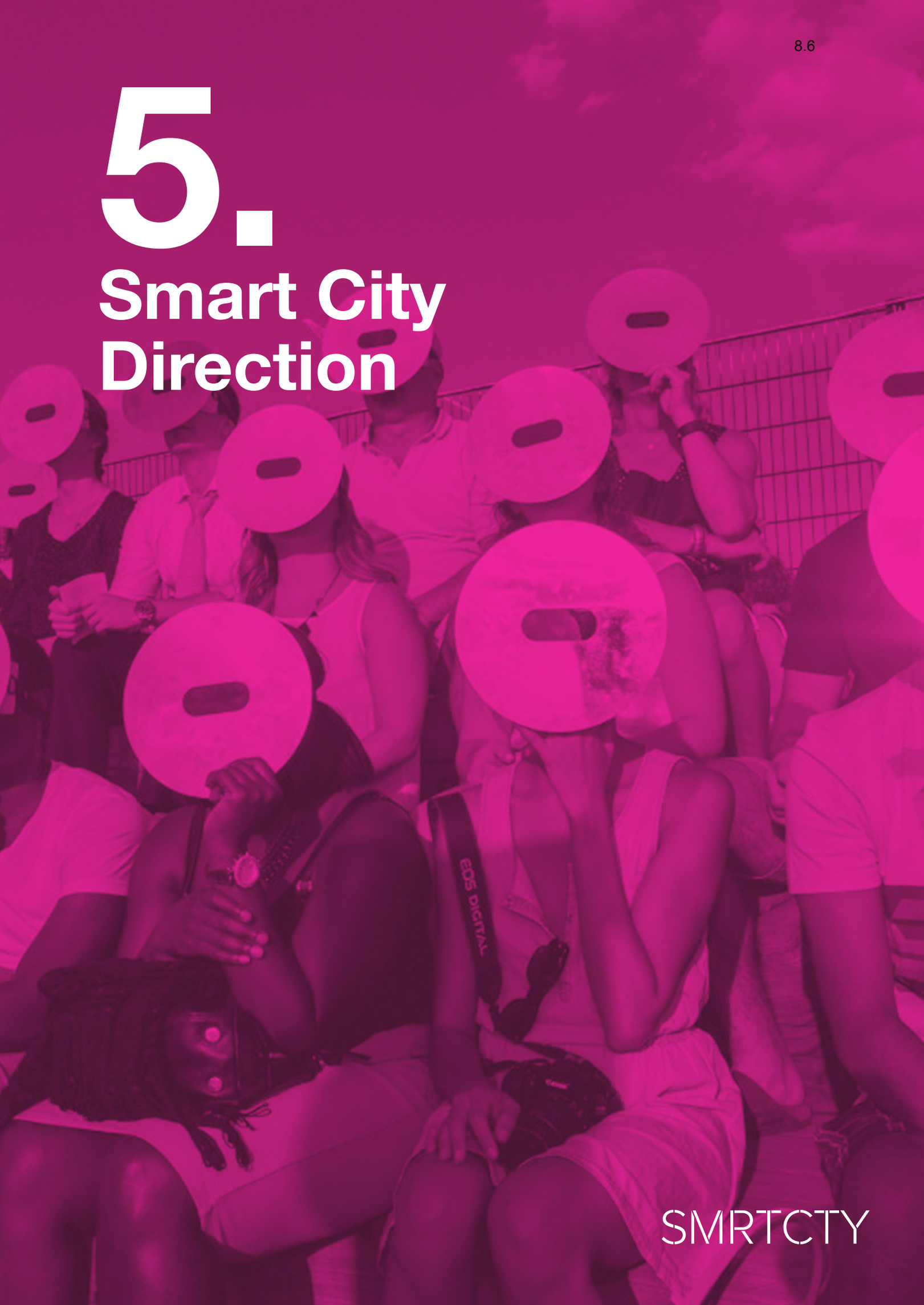
SMRTCTY

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

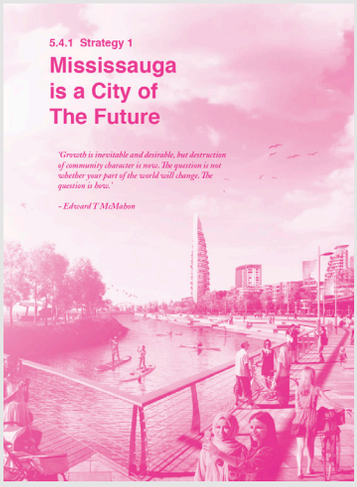
Internal Processes
We continually look for ways to improve our internal data systems and have ongoing projects looking at continuous improvement in this area. Examples include: Data and Analytics Strategy, Continuous Improvement Plans with a focus on LEAN methodology, Enhancement of Data Driven Decision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

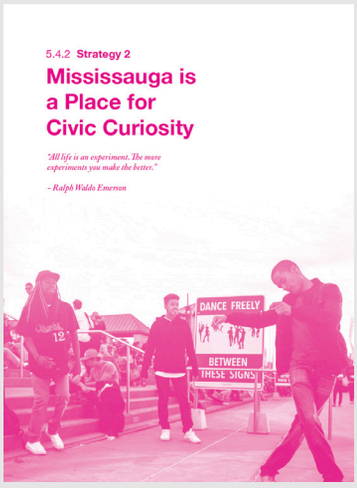
Our goals are ambitious but achievable. There are three Actions that will help guide and implement Smart City Projects.



1

Mississauga is a City of the Future

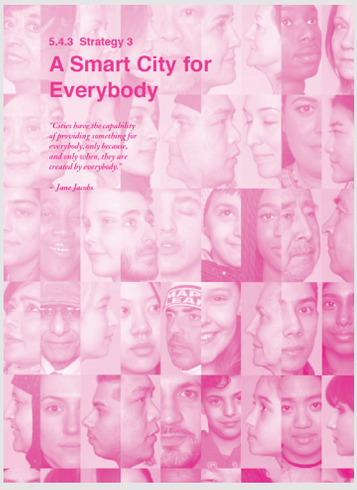
This Strategy will help direct the future of large scale projects across the city.



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.

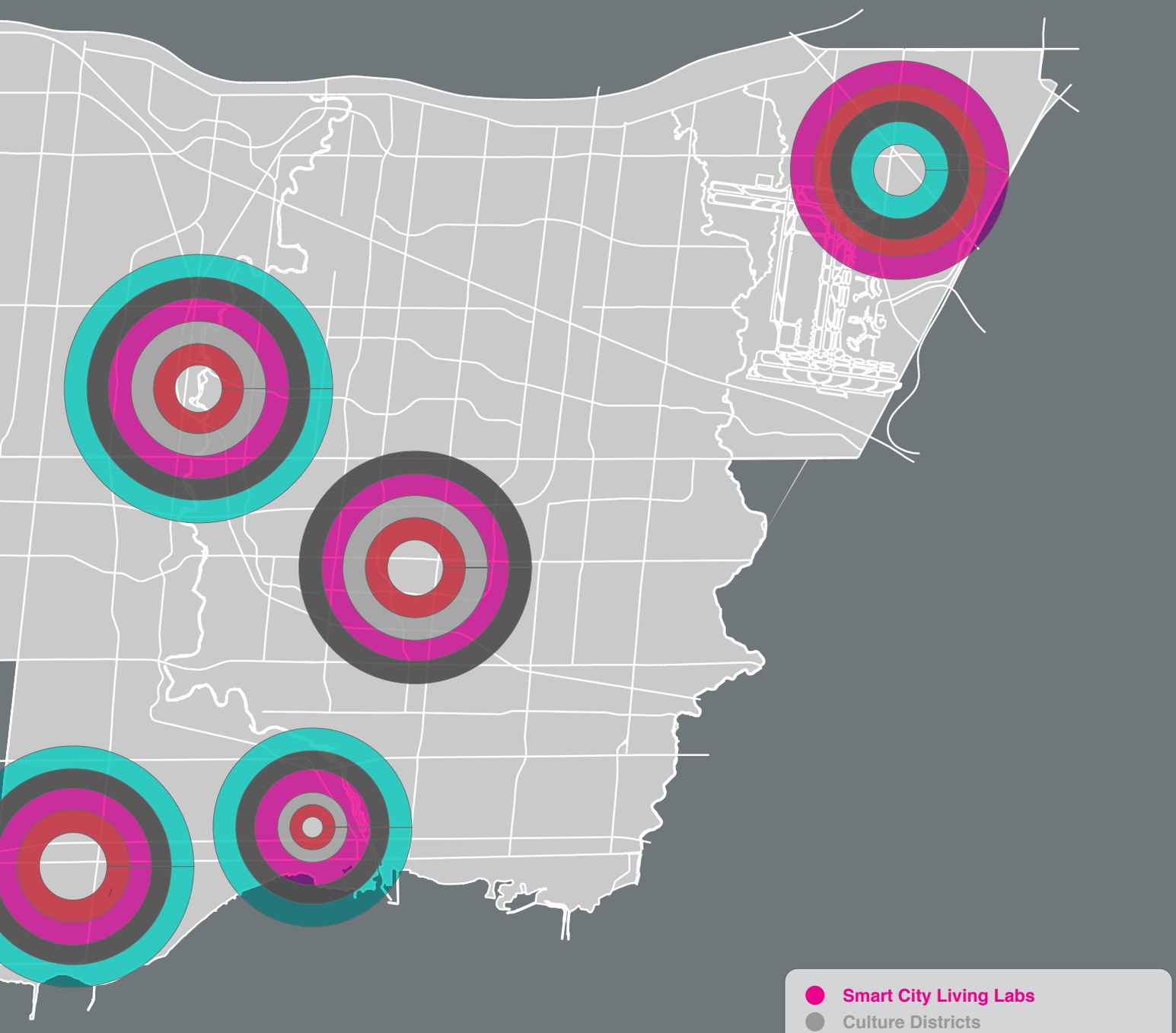
1 https://www.un.org/en/development/desa/news/population/world-urbanization-prospects-2014.html

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.'

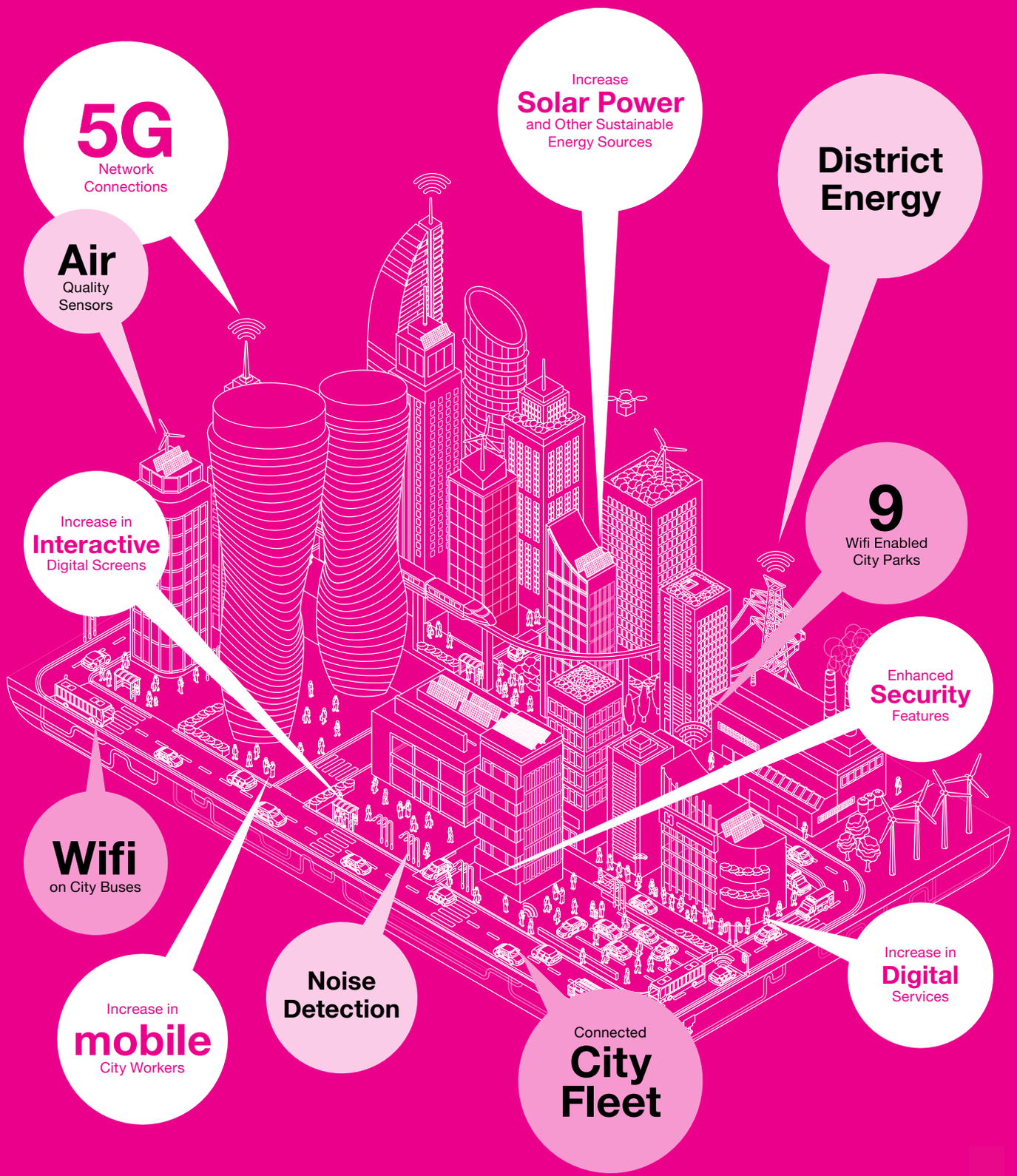
As part of this new direction Smart City initiatives have been encouraged with the public RFP process in developing new digital opportunities across the Library System and the Central Library redevelopment project.

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.

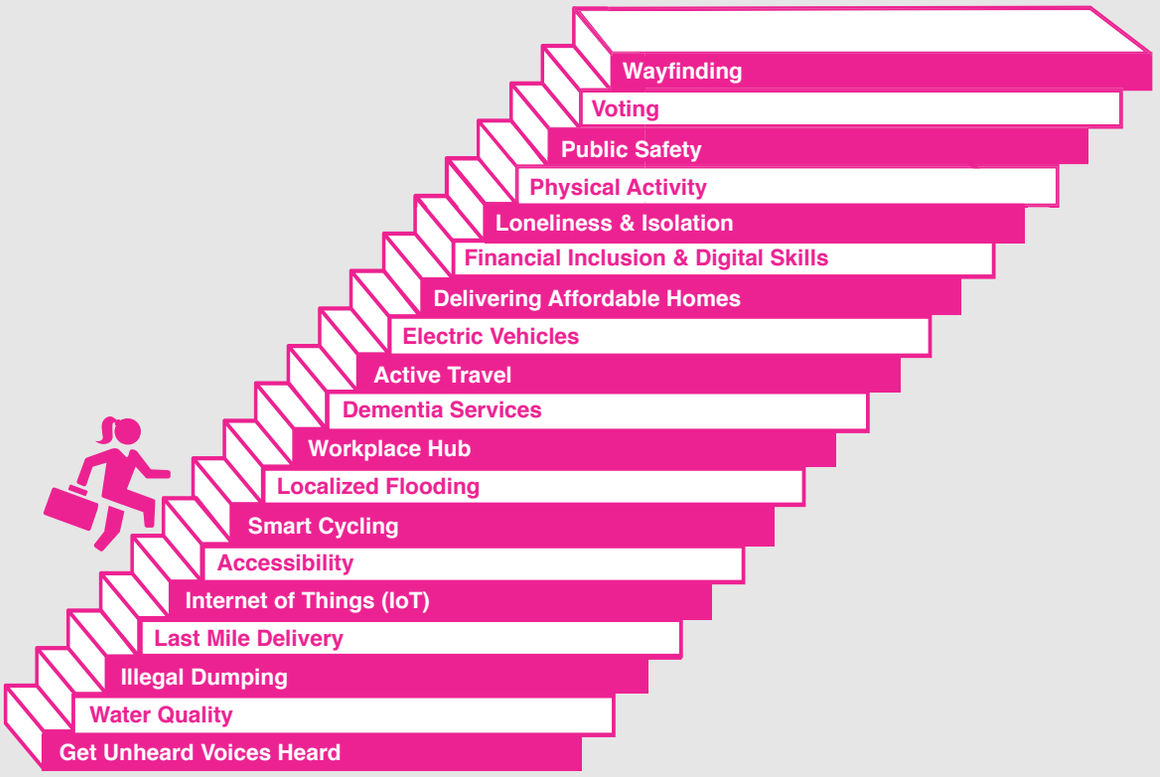
Augmented Reality - A geolocative AR project that will engage the public and showcase public art. Led by a local start up, this project involves collaboration between Culture, Tourism and Smart City.

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.

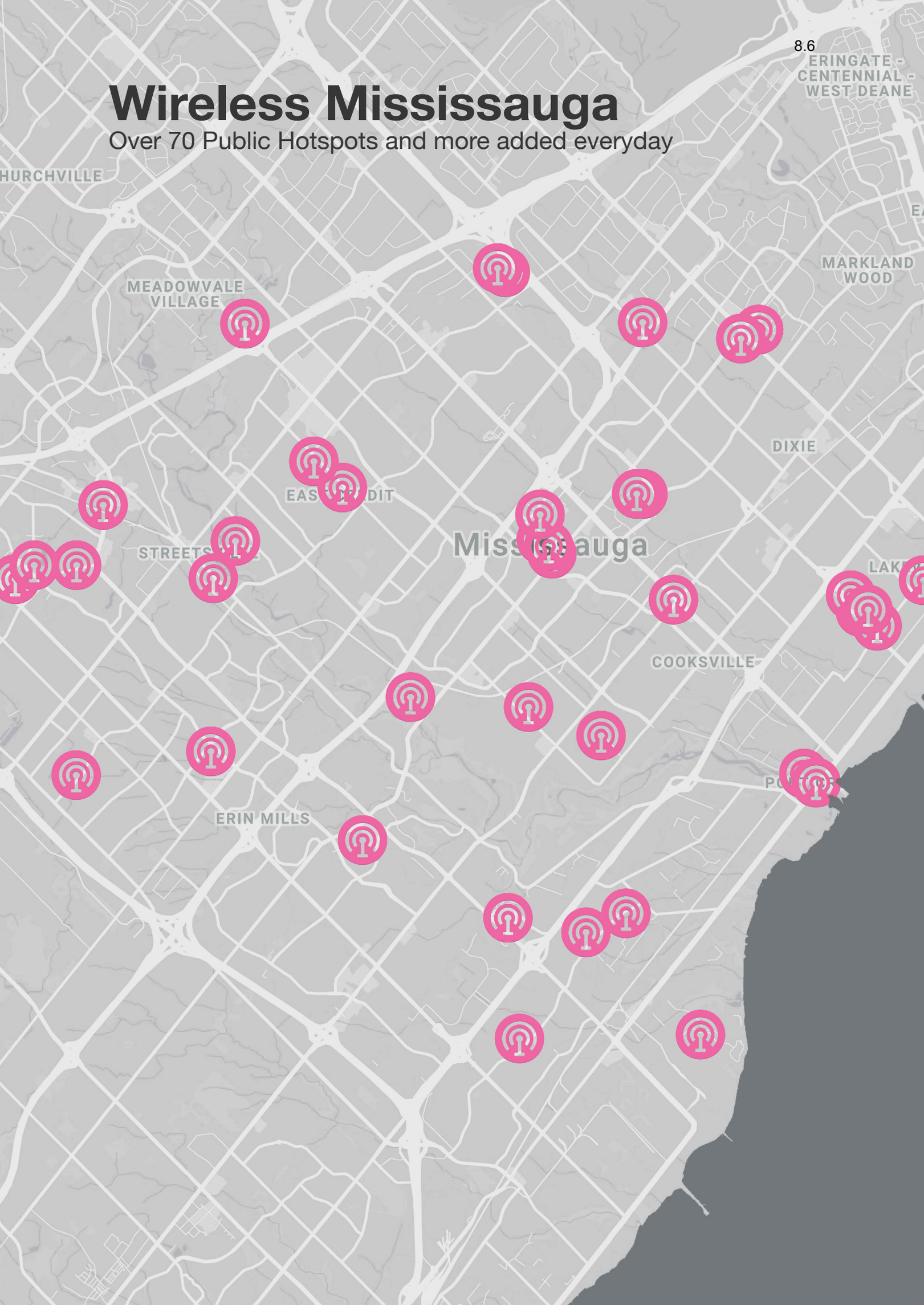
Laptop and Hotspot Lending Program (LHLP) - Not all Mississaugans have the same access to laptops and data hotspots. Through the Library System, in partnership with Smart City and United Way of Peel Region, the City of Mississauga will expand their current technology lending program to help bridge the 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:

CANADIAN URBAN INSTITUTE

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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.

SMRTCTY

smartcity.mississauga.ca

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 2019/06/04

To: Chair and Members of General Committee

From: Geoff Wright, P. Eng., MBA, Commissioner of Transportation and Works

Originator's files:
MG.23.REP
RT.10.Z-39W

Meeting date:
2019/06/26

Subject
Lower Driveway Boulevard Parking – Leeside Crescent (Ward 9)

Recommendation
That a by-law be enacted to amend the Traffic By-law 555-00, as amended, to implement lower driveway boulevard parking between the curb and sidewalk, at any time on Leeside Crescent, between Bell Harbour Drive and Chorley Place as outlined in the report from the Commissioner of Transportation and Works, dated June 4, 2019, entitled "Lower Driveway Boulevard Parking – Leeside Crescent (Ward 9)".

Background
The Transportation and Works Department received a completed petition from an area resident with respect to the feasibility of implementing lower driveway boulevard parking on Leeside Crescent, between Bell Harbour Drive and Chorley Place. Lower driveway boulevard parking between the curb and sidewalk is currently prohibited and five-hour parking is permitted on Leeside Crescent. A location map is attached as Appendix 1.

Comments
To determine the level of support for lower driveway boulevard parking between the curb and sidewalk, a parking questionnaire was distributed to the residents of Leeside Crescent.

A total of 59 questionnaires were delivered and 25 (42%) were returned; 24 (96%) supported the implementation of lower driveway boulevard parking and 1 (4%) was opposed. Since greater than 66% of the total respondents support lower driveway boulevard parking, the Transportation and Works Department recommends implementing lower driveway boulevard parking on Leeside Crescent, between Bell Harbour Drive and Chorley Place.

The Ward Councillor supports the proposal for lower driveway boulevard parking. The existing on-street parking regulations will be maintained.

Financial Impact

Costs for the sign installation can be accommodated in the 2019 Operating Budget.

Conclusion

Based on the results of the questionnaire, the Transportation and Works Department supports lower driveway boulevard parking between the curb and sidewalk on Leeside Crescent, between Bell Harbour Drive and Chorley Place.

Attachments

Appendix 1: Location Map - Lower Driveway Boulevard Parking – Leeside Crescent

Geoff Wright, P. Eng., MBA, Commissioner of Transportation and Works

Prepared by: Wasan Yonan, C.E.T., Traffic Technician

MISSISSAUGA

Transportation and Works

Traffic Mgmt & Municipal Parking

Lower Driveway Boulevard Parking
Leeside Crescent
(Ward 9)

SCALE FOR REDUCED DRAWINGS
0m 25m 50m 100m 150m 200m 250m 500m

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 2019/06/04

To: Chair and Members of General Committee

From: Geoff Wright, P. Eng., MBA, Commissioner of Transportation and Works

Originator's files:
MG.23.REP
RT.10.Z07

Meeting date:
2019/06/26

Subject
Enola Avenue – Speed Limit Reduction (Ward 1)

Recommendation
That a by-law be enacted to amend the Traffic By-law 555-00, as amended, to reduce the regulatory posted speed limit from 50 km/h to 40 km/h on Enola Avenue, south of Lakeshore Road East as outlined in the report from the Commissioner of Transportation and Works, dated June 4, 2019 and entitled "Enola Avenue – Speed Limit Reduction (Ward 1)".

Background
Enola Avenue is a two-lane local residential roadway running perpendicular to Lakeshore Road East. It currently has a regulatory posted speed limit of 50 km/h. A location map is attached as Appendix 1.

A petition was initially presented to Council in 2017 by local residents of Enola Avenue highlighting concerns with respect to traffic and pedestrian safety. They requested a reduction in the posted speed limit to 30 km/h.

Comments
Transportation and Works Department staff completed a speed review of Enola Avenue, south of Lakeshore Road East, to determine current operating speeds. The results of staff's review revealed the following:

Enola Avenue - south of Lakeshore Road East

Time	Posted Speed Limit	Average Speed	85th Percentile Speed
8:00am to 10:00am	50 km/h	36 km/h	42 km/h
3:00pm to 6:00pm	50 km/h	37 km/h	42 km/h

The above results reveal that, despite the current regulatory speed limit of 50 km/h, the vast majority of motorists are travelling at speeds that are appropriate for the conditions on the roadway, closer to 40 km/h. While staff does not support a reduction in the posted speed limit to 30 km/h, based on the observed operating speeds, staff does support a speed limit to 40 km/h on Enola Avenue, south of Lakeshore Road East.

The Ward Councillor has been consulted and supports staff's recommendation.

Financial Impact

Costs for the sign installations can be accommodated in the 2019 Operating Budget.

Conclusion

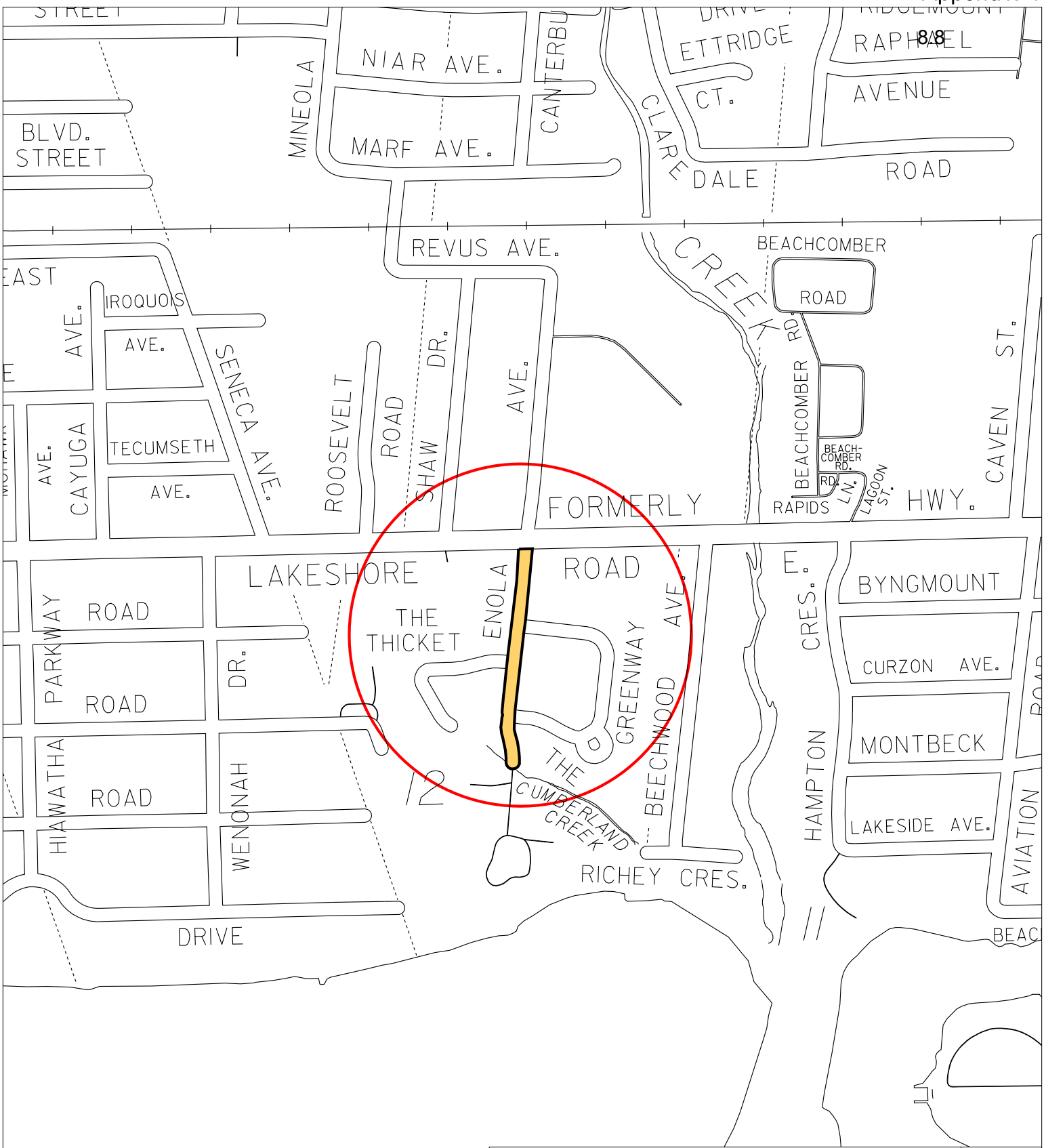
To reflect the current operating speeds of the roadway and address resident concerns related to traffic and pedestrian safety within a local residential neighbourhood, the Transportation and Works Department supports the reduction of the posted regulatory speed limit to 40 km/h on Enola Avenue, south of Lakeshore Road East.

Attachments

Appendix 1: Location Map – Enola Avenue (Ward 1)

Geoff Wright, P. Eng., MBA, Commissioner of Transportation and Works

Prepared by: Maxwell Gill, C.E.T., Supervisor of Traffic Operations



MISSISSAUGA

Transportation and Works

Traffic Mgmt & Municipal Parking

Speed Limit Reduction
Enola Avenue
(Ward 1)

SCALE FOR REDUCED DRAWINGS

0m 25m 50m 100m 150m 200m 250m 500m

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 2019/06/04

To: Chair and Members of General Committee

From: Geoff Wright, P. Eng., MBA, Commissioner of Transportation and Works

Originator's files:
MG.23.REP
RT.10.Z-8

Meeting date:
2019/06/26

Subject
All-way Stop - Benson Avenue and High Street West (Ward 1)

Recommendation
That an all-way stop control not be implemented at the intersection of Benson Avenue and High Street West as outlined in the report from the Commissioner of Transportation and Works, dated June 4, 2019 and entitled "All-way Stop - Benson Avenue and High Street West (Ward 1)".

Background
The Transportation and Works Department has been requested by the Ward Councillor to submit a report to General Committee regarding the implementation of an all-way stop at the intersection of Benson Avenue and High Street West.

Currently the intersection of Benson Avenue and High Street West operates as a four-leg intersection with a stop control for eastbound/westbound traffic on High Street West. A location map is attached as Appendix 1.

Comments
A turning movement count was completed on April 17, 2019 to determine the need for an all-way stop based on traffic volumes. The results are as follows:

Benson Avenue and High Street West		Warrant Value
Part "A"	Volume for All Approaches	40%
Part "B"	Minor Street Volume	39%

As per the criteria for all-way stops outlined by the Ministry of Transportation, in order for an all-way stop to be warranted, both parts "A" and "B" must equal 100%.
A review of the collision history at this intersection did not reveal any reported collisions within the past three years. For an all-way stop control to be warranted based on collision frequency, at least five collisions must occur in a 12-month period, provided the collisions are of the type considered correctable by the use of an all-way stop (i.e. turning movement, angle collisions).

An all-way stop is therefore not warranted based on the turning movement count results and collision history.

Financial Impact

In the event that an all-way stop is installed, the cost for the sign installation can be accommodated in the 2019 Operating Budget.

Conclusion

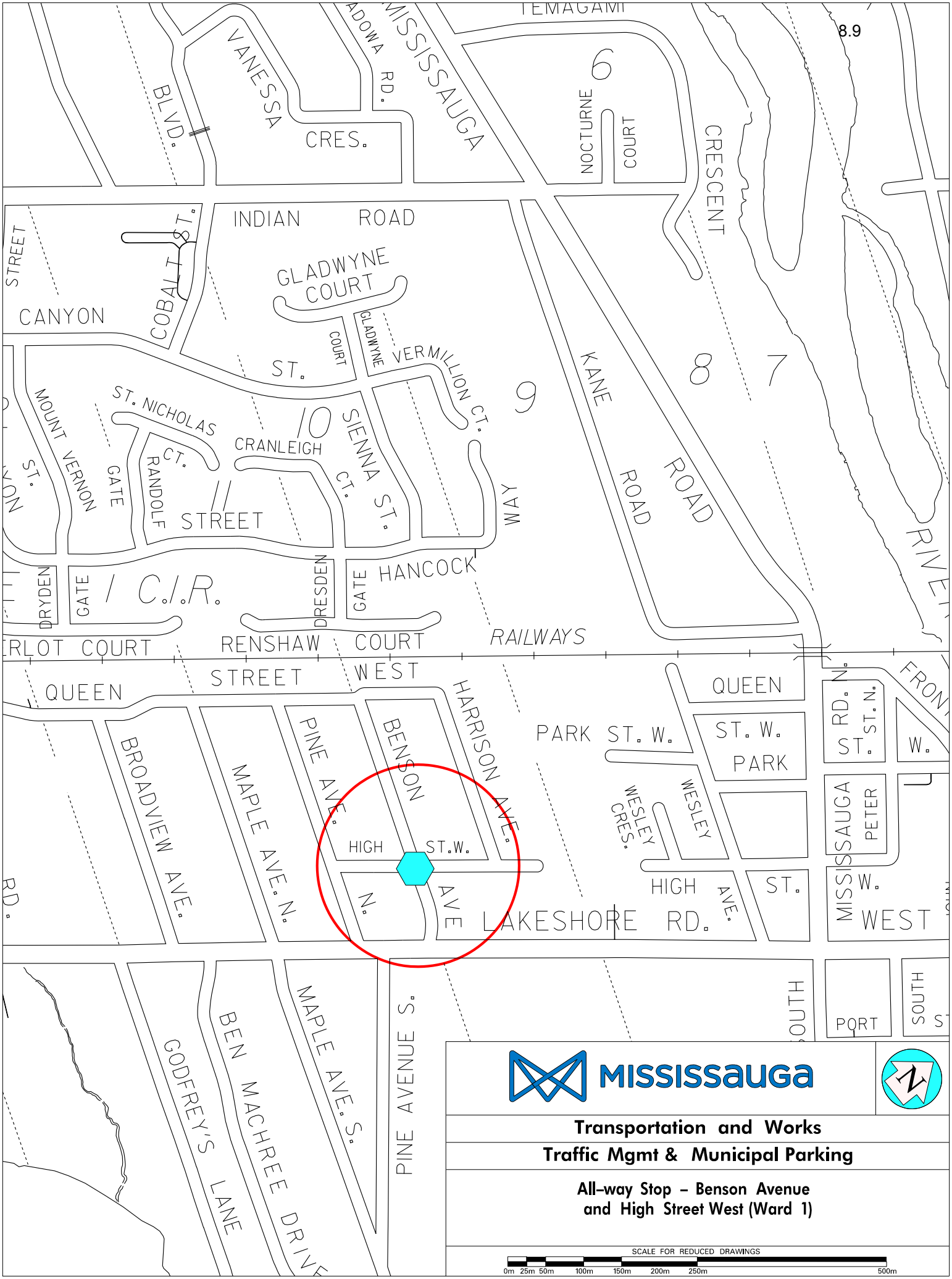
Based on the manual turning movement count results and collision history at this intersection, the Transportation and Works Department recommends against the installation of an all-way stop at the intersection of Benson Avenue and High Street West.

Attachments

Appendix 1: Location Map - All-way Stop - Benson Avenue and High Street West (Ward 1)

Geoff Wright, P. Eng., MBA, Commissioner of Transportation and Works

Prepared by: Ouliana Drobychevskaia, Traffic Operations Technologist



MISSISSAUGA

Transportation and Works

Traffic Mgmt & Municipal Parking

All-way Stop – Benson Avenue and High Street West (Ward 1)

SCALE FOR REDUCED DRAWINGS

0m 25m 50m 100m 150m 200m 250m 500m

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 2019/06/06

To: Chair and Members of General Committee

From: Geoff Wright, P. Eng., MBA, Commissioner of Transportation and Works

Originator's files:

Meeting date: 2019/06/26

Subject
2019 Traffic Calming Program

Recommendation
1. That the 2019 Traffic Calming Program as outlined in the report from the Commissioner of Transportation and Works, dated June 6, 2019 and entitled "2019 Traffic Calming Program", be approved.
2. That the report from the Commissioner of Transportation and Works, dated June 6, 2019 and entitled "2019 Traffic Calming Program" be referred to the Mississauga Traffic Safety Council, Cycling Advisory Committee and the Mississauga Road Safety Committee for information.

Report Highlights
- As part of the ongoing prioritization of the Traffic Calming Program, five neighbourhoods were selected as candidates for implementation of physical traffic calming measures for the 2019 Program.
- To determine the level of support and to refine the traffic calming plan for the neighbourhoods, a number of public consultations with Road Safety staff, the local Ward Councillors and area residents were held to discuss the preliminary plans for the neighbourhoods.
- No concerns have been raised from Emergency Services or MiWay staff regarding the proposed traffic calming measures.
- The combined estimated cost for the installation of the physical traffic calming measures within the neighbourhoods is $160,000 and can be accommodated within the 2019 Traffic Calming Program capital budget.

Background

Following the Traffic Calming Pilot Program, an annual Traffic Calming Program and Policy was approved by City Council in 2016.

Traffic calming has been initiated to address operational issues related to speeding and aggressive driving and as a part of the ongoing prioritization of the Traffic Calming Program.

Whenever the Road Safety Unit is in receipt of a concern regarding speeding, aggressive driving and/or traffic infiltration on City roadways, the first step undertaken by staff is to identify the area of concern and arrange for the collection of location information, including speed and volume data.

Once a speeding concern is identified, Road Safety staff can utilize a number of passive traffic calming techniques to reduce vehicle operating speeds. These passive traffic calming measures can include the implementation of painted edge/centre lines, the use of a speed awareness device and enforcement.

If an ongoing identified concern cannot be resolved through other more passive traffic calming measures, Road Safety staff will evaluate the location against the criteria outlined in the Traffic Calming Policy 10-09-03. If a location does qualify based on the criteria outlined in the policy, it will be prioritized on a list of traffic calming locations.

At the close of 2018, staff reviewed the list of the traffic calming locations that qualified for the implementation of physical traffic calming. In addition, Road Safety staff made arrangements to incorporate the installation of traffic calming devices into the resurfacing program for the 2019 construction year.

The five eligible traffic calming locations were prioritized based on the severity of the speeding concern taking into account other factors such as overall traffic volumes, the presence of sidewalks or cycling facilities, and neighbourhood pedestrian generators such as schools and parks.

This report identifies and considers the following locations for physical traffic calming measures:

- Havenwood Drive (Ward 3) between Gulleden Drive and Fieldgate Drive (refer to location map in Appendix 1)
- Forestwood Drive (Ward 6) between Wolfdale Road and The Credit Woodlands (refer to location map in Appendix 2)
- Lorne Park Road (Ward 2) between Truscott Drive and Birchwood Drive (refer to location map in Appendix 3)

- Twain Avenue (Ward 11) between Mavis Road and McLaughlin Road (refer to location map in Appendix 4)
- Erin Centre Boulevard (Ward 10) between Tenth Line West and Ninth Line (refer to location map in Appendix 5).

Havenwood Drive

Staff collected traffic data at multiple locations along Havenwood Drive prior to engaging the Ward Councillor and the public. Results of these studies are as follows:

Havenwood Drive	Posted Speed (km/h)	Fall 2018
		85th Percentile Speed (km/h)
Between Gulleden Drive and Haven Glenn	40	50
Between Williamsport Drive and Haven Glenn	40	51
Between Tyneburn Crescent and Fieldgate Drive	40	55

Based on the results of the speed studies and the scheduled resurfacing for Havenwood Drive it was determined that this location would benefit from the implementation of traffic calming.

Forestwood Drive

Staff collected traffic data at multiple locations along Forestwood Drive prior to engaging the Ward Councillor and the public. Results of these studies are as follows:

Forestwood Drive	Posted Speed (km/h)	Fall/Winter 2018
		85th Percentile Speed (km/h)
Between McBride Avenue and Jessica Court	40	58
Between McBride Avenue and Stainton Drive	40	55
Between Lenester Drive and Lindenlea Drive	40	52

Based on the results of the speed studies and the scheduled resurfacing for Forestwood Drive it was determined that this location would benefit from the implementation of traffic calming.

Twain Avenue

Staff collected traffic data along Twain Avenue prior to engaging the Ward Councillor and the public. Results of these studies are as follows:

Location	Posted Speed (km/h)	Spring 2018	Summer 2018
		85th Percentile Speed (km/h)	85th Percentile Speed (km/h)
Between Gershwin Street and Milano Court	40	60	58

The results indicated a speeding concern on Twain Avenue between Gershwin Street and Milano Court. Therefore, it was determined that additional corrective measures in the form of physical traffic calming were required to address the ongoing concerns with speeding and aggressive driving.

Lorne Park Road

Staff reviewed the traffic data that was collected on Lorne Park Drive between Indian Road and Lakeshore Boulevard West to determine the boundaries for this project. Based on the results of the traffic studies Lorne Park Road between Truscott Drive and Birchwood Drive met the criteria outlined in the Traffic Calming policy. The results of the traffic studies are as follows:

Location	Posted Speed (km/h)	Fall 2018
		85th Percentile Speed (km/h)
Between Truscott Drive and Birchwood Drive	40	57

The results indicated a speeding concern on Lorne Park Road between Truscott Drive and Birchwood Drive. Therefore, it was determined that additional corrective measures in the form of physical traffic calming are required to address the ongoing concerns with speeding and aggressive driving.

Erin Centre Boulevard

Staff collected traffic data at multiple locations along Erin Centre Boulevard prior to engaging the Ward Councillor and the public. The results of the traffic studies are as follows:

Erin Centre Boulevard	Posted Speed km/h	85th Percentile Speed (km/h)
Between Tenth Line and Adobe Court	40	56
Between Mayla Drive and Mallory Road	50	64
Between Eaglesview Drive and Placid Place	50	69

The results indicated a speeding concern on Erin Centre Boulevard between Tenth Line West and Ninth Line. Therefore, it was determined that additional corrective measures in the form of physical traffic calming are required to address the ongoing concerns with speeding and aggressive driving.

Comments

Once Road Safety staff identified candidates for the installation of physical traffic calming measures, preliminary plans for each neighbourhood to address the identified issues were developed. Staff considered the different types of traffic calming devices and overall roadway characteristics to achieve operating speeds, which are consistent with the posted speed limit. These factors include traffic calming type, spacing, layout and impacts the installation of physical traffic calming devices may have on local residents and City services.

Public Consultation

To determine the level of support and to refine the traffic calming plan for the neighbourhood, a number of public consultations with Road Safety staff, the local Ward Councillors and area residents were held to discuss the preliminary plans for the neighbourhoods. Arrangements were made to meet directly with the affected residents in a public information centre where staff presented preliminary plans and provided residents with the opportunity to discuss issues directly with staff and/or leave written comments and feedback. The results of the public meeting consultations are as follows:

- Havenwood Drive - 65% of respondents were supportive of the proposed measures along Havenwood Drive. These measures include a series of speed cushions that will be installed between Gulleden Drive and Fieldgate Drive.
- Forestwood Drive - 72% of respondents were supportive of the proposed measures along Forestwood Drive. These measures include a series of speed cushions that will be installed between Wolfdale Road and The Credit Woodlands.

- Twain Avenue - 83% of respondents were supportive of the proposed measures along Twain Avenue. These measures include a series of speed cushions that will be installed between Mavis Road and McLaughlin Road.
- Lorne Park Road - Due to the limited area proposed for traffic calming and based on the consultation with the Ward 2 Councillor, it was decided that a public meeting would not be held for this project; however notification letters were mailed to the affected residents. Staff mailed notices to the residents of Lorne Park Road between Truscott Drive and Birchwood Drive and the Principal of Lorne Park Secondary School with detailed information regarding the proposed traffic calming project. Staff did not receive any objections from the notified residents.
- Erin Centre Boulevard- 93% of respondents were supportive of the proposed measures along Erin Centre Boulevard. These measures include a series of speed cushions that will be installed between Tenth Line West and Ninth Line.

In consultation with the local Ward Councillors, the decision was made to pursue the installation of these physical traffic calming measures on Havenwood Drive, Forestwood Drive, Twain Avenue, Lorne Park Road and Erin Centre Boulevard.

Staff provided the revised concept plans to appropriate Emergency Services and MiWay staff and no concerns have been raised regarding the proposed traffic calming.

Financial Impact

The estimated cost for the installation of physical traffic calming measures within the Havenwood Drive, Forestwood Drive, Twain Avenue, Lorne Park Road and Erin Centre Boulevard is $160,000 and can be accommodated within the 2019 Traffic Calming Program capital budget.

Conclusion

There is sufficient interest from local area residents, as well as support from the affected Ward Councillors, for the implementation of physical traffic calming measures within the Havenwood Drive, Forestwood Drive, Twain Avenue, Lorne Park Road and Erin Centre Boulevard.

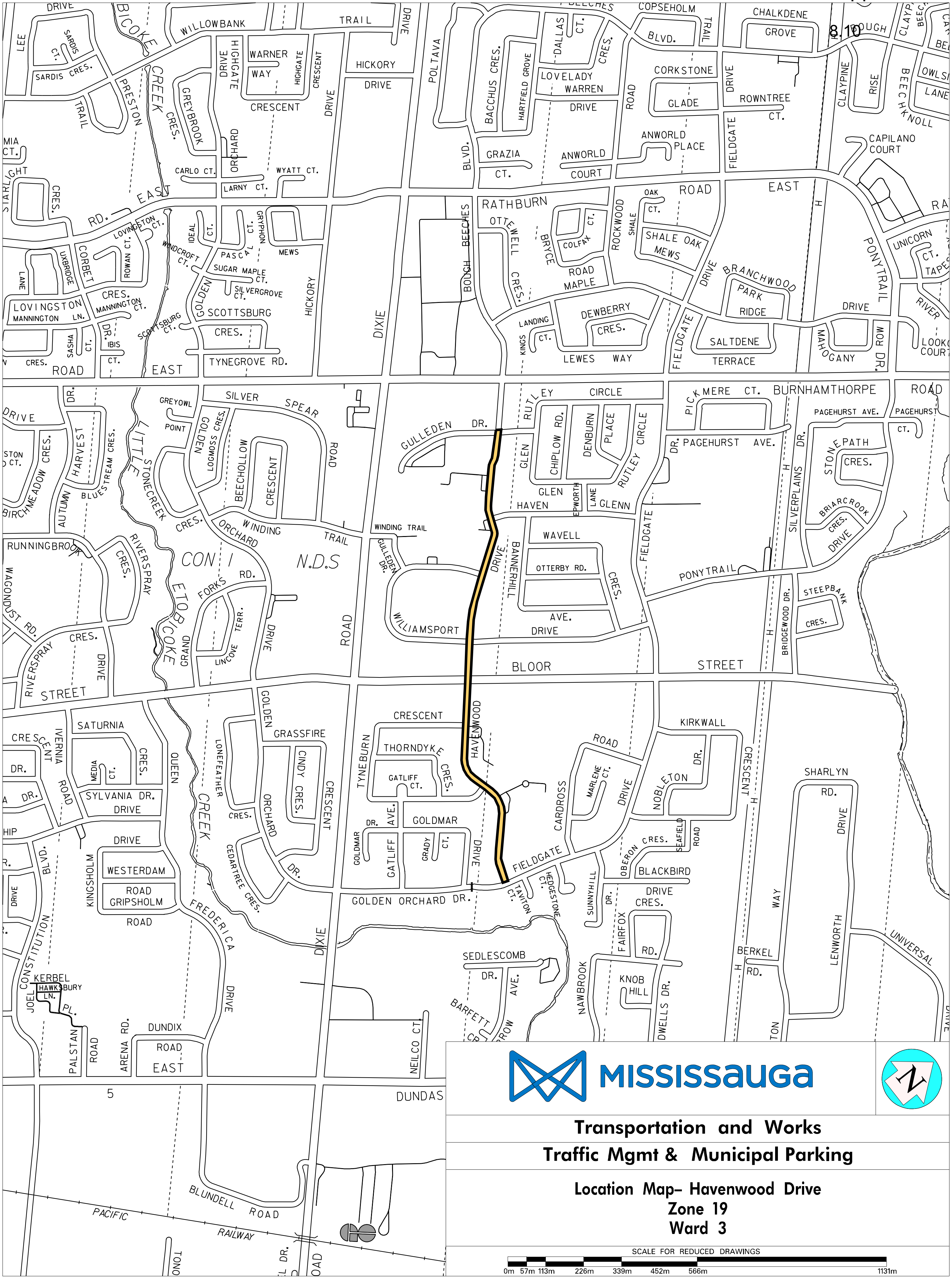
Attachments

Appendix 1: Location Map – Havenwood Drive between Gulleden Drive and Fieldgate Drive (Ward 3)
Appendix 2: Location Map – Forestwood Drive between Wolfedale Road and The Credit Woodlands (Ward 6)
Appendix 3: Location Map – Lorne park Road between Truscott Drive and Birchwood Drive (Ward 2)

Appendix 4: Location Map – Twain Avenue between Mavis Road and McLaughlin Road (Ward 11)
Appendix 5: Location Map – Erin Centre Boulevard between Tenth Line West and Ninth Line (Ward 10)

Geoff Wright, P. Eng., MBA, Commissioner of Transportation and Works

Prepared by: William Wright, C.E.T, Road Safety Technologist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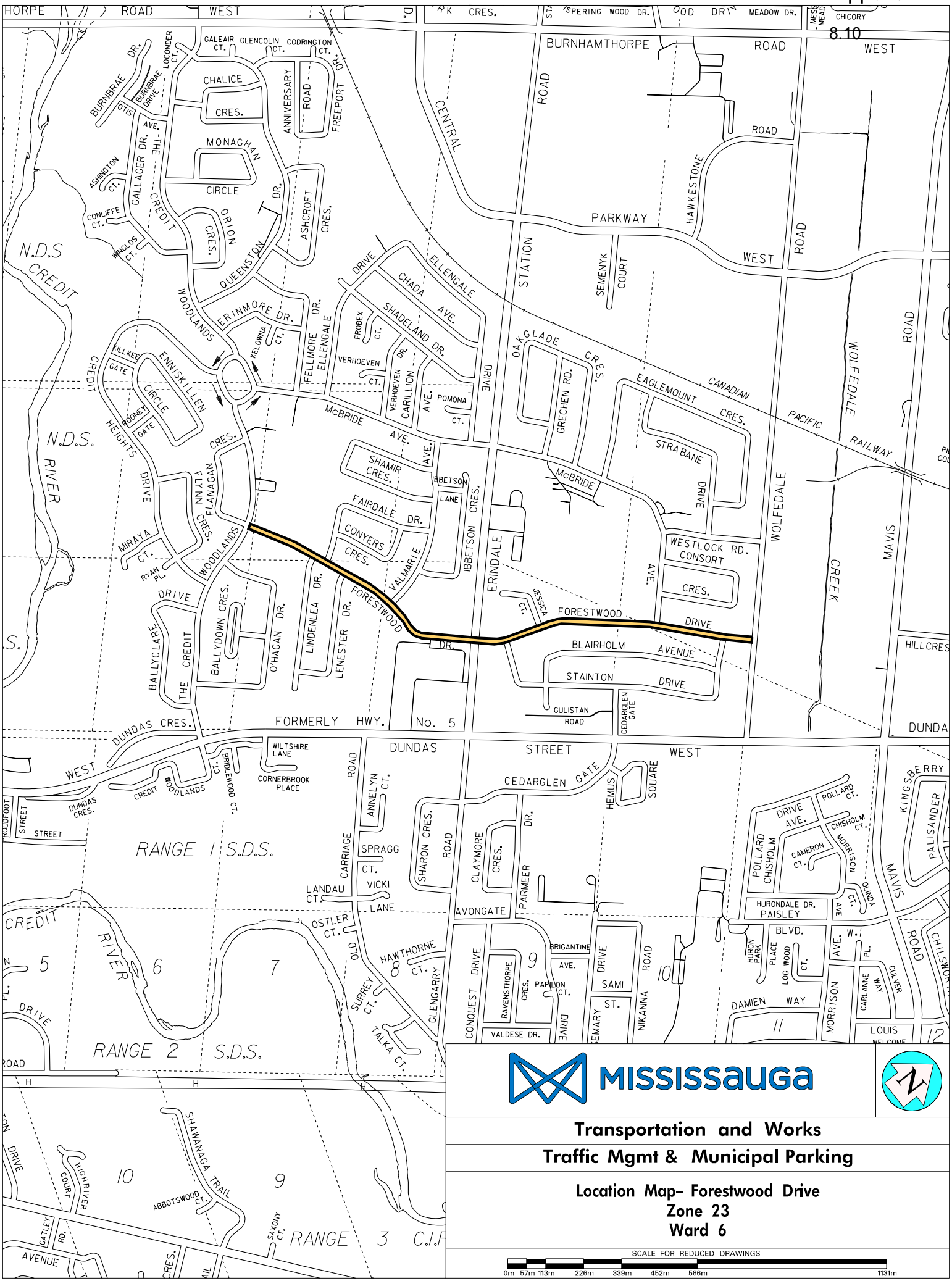
MISSISSAUGA
Transportation and Works
Traffic Mgmt & Municipal Parking
Location Map- Havenwood Drive
Zone 19
Ward 3
SCALE FOR REDUCED DRAWINGS
0m 57m 113m 226m 339m 452m 566m 1131m
RATHBURN ROAD EAST
BURNHAMTHORPE ROAD EAST
BLOOR STREET
DUNDAS
DIXIE ROAD
HAVENWOOD DRIVE
GOLDEN ORCHARD DR.
FIELDGATE DRIVE
GULLEDEN DR.
WILLIAMSPORT DRIVE
PONYTRAIL
CONSTITUTION BLVD.
BLUNDELL ROAD
PACIFIC RAILWAY
ETOBICOKE CREEK
LITTLE ETOBICOKE CREEK
CON I N.D.S
BLVD.
HICKORY DRIVE
HIGHCATE DRIVE
MAPLE ROAD
CARDROSS ROAD
GOLDMAR DRIVE
TYNEBURN CRESCENT
THORNDYKE CRES.
GATLIFF AVE.
BANNERHILL DRIVE
GLEN HAVEN
WAVELL CRES.
OTTERBY RD.
SEDLESCOMB DR.
NAWBROOK
KIRKWALL CRESCENT
NOBLETON DRIVE
SHARLYN RD.
LENWORTH DRIVE
UNIVERSAL



MISSISSAUGA

Transportation and Works

Traffic Mgmt & Municipal Parking

Location Map– Forestwood Drive
Zone 23
Ward 6

SCALE FOR REDUCED DRAWINGS

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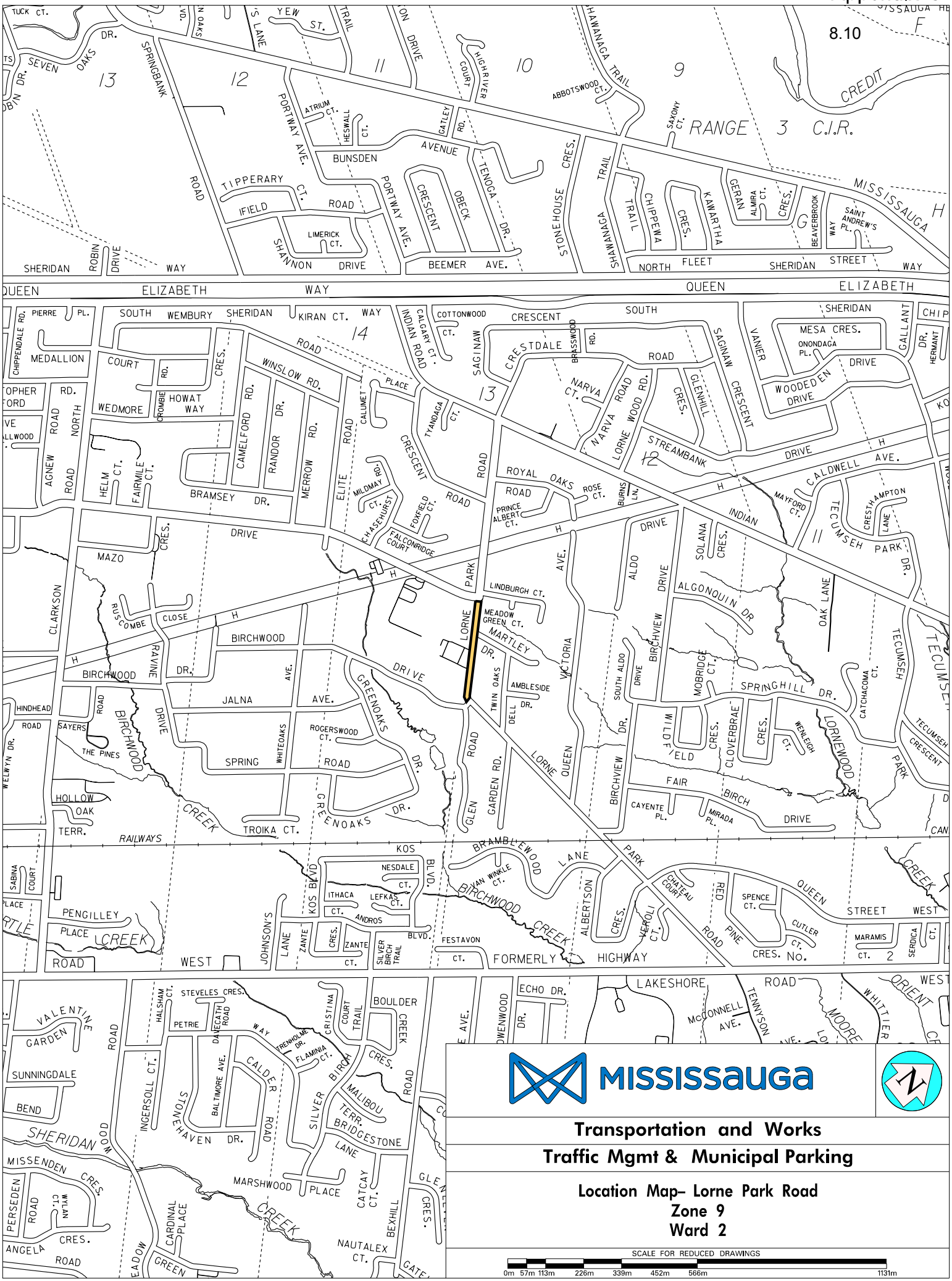
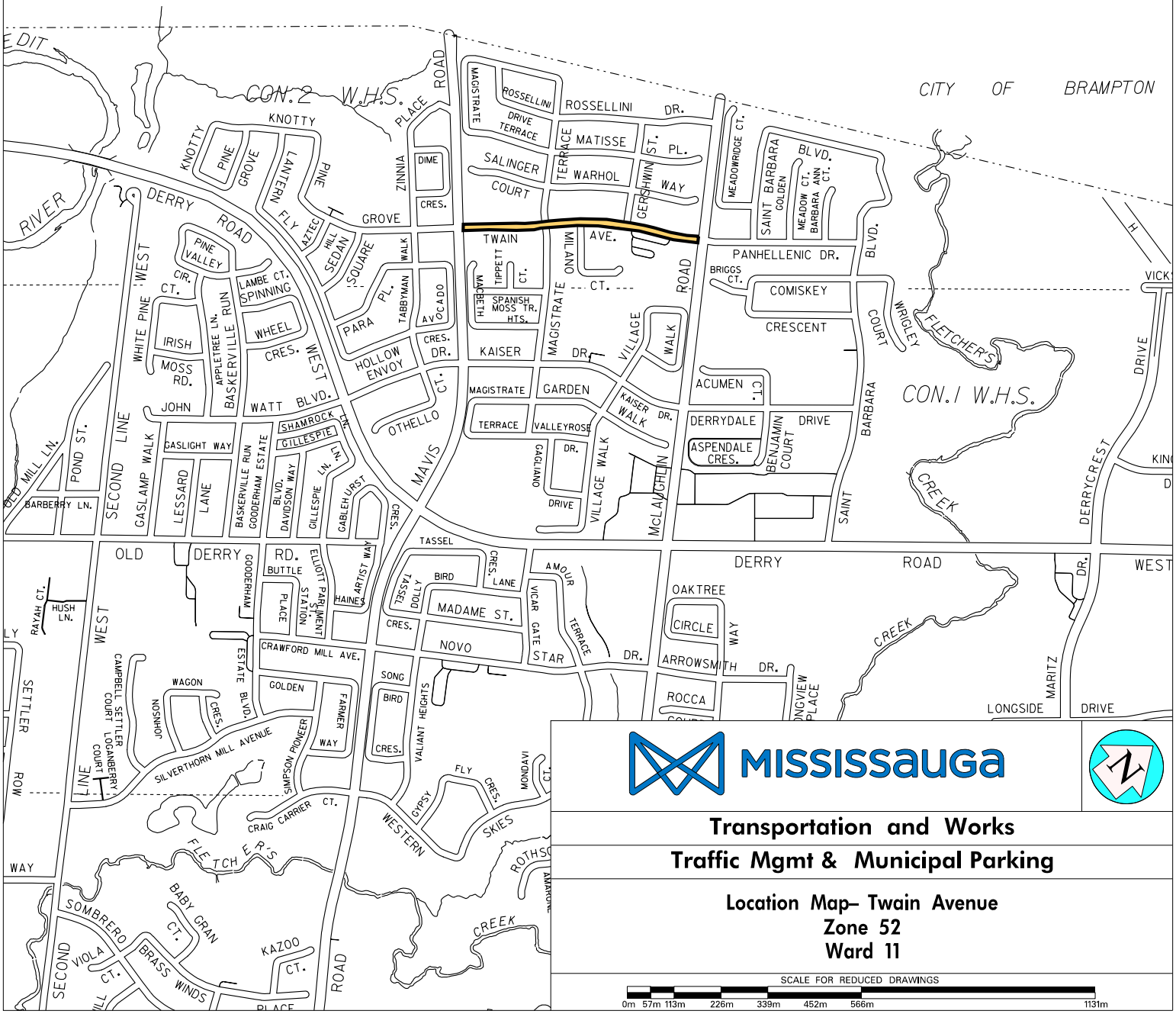
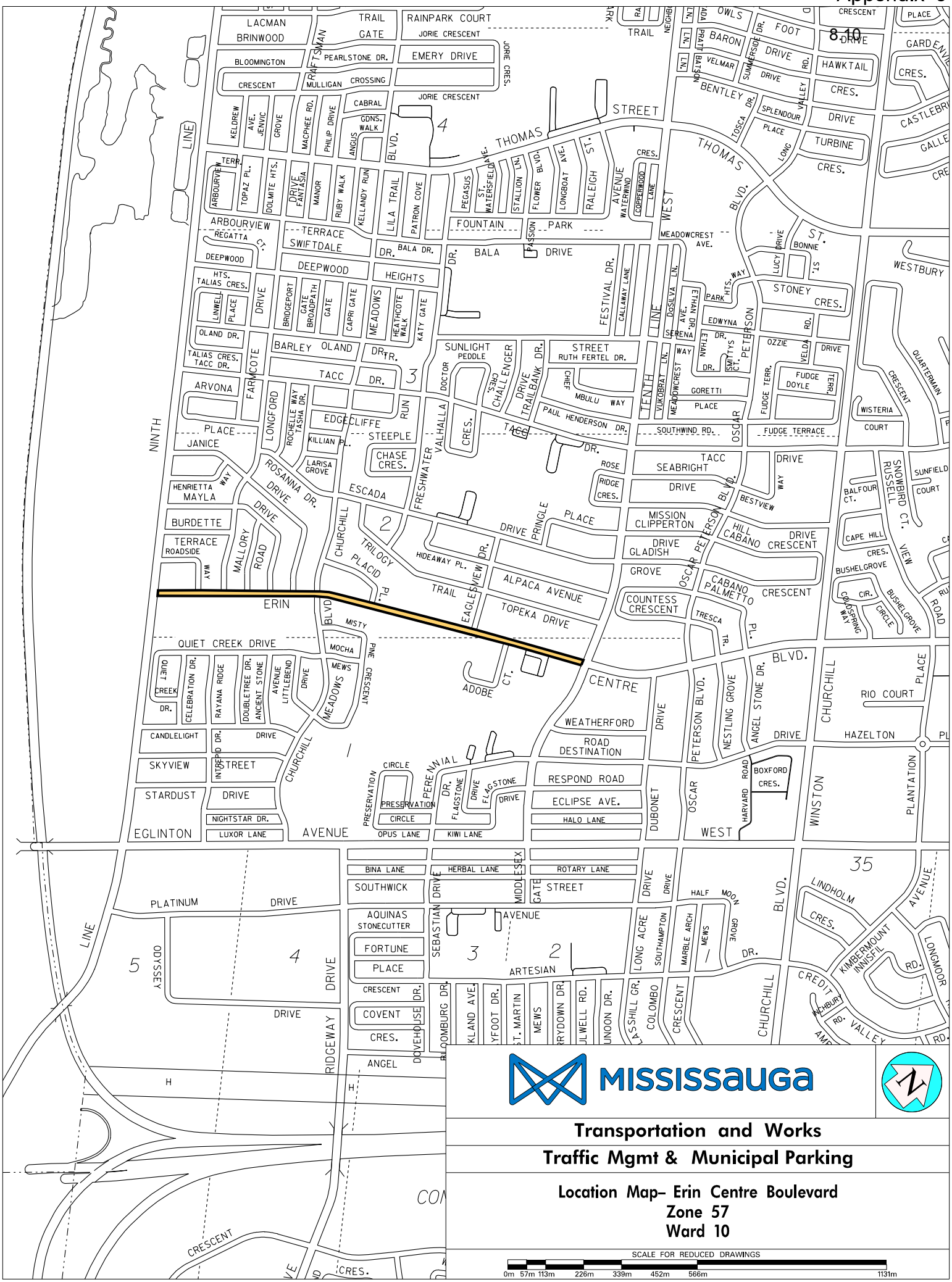
Appendix 3

8.10




CITY OF BRAMPTON
CON.2 W.H.S.
CON.1 W.H.S.
DERRY ROAD
WEST
OLD DERRY RD.
ROSSELLINI DR.
MATISSE ST.
SALINGER COURT
TERRACE
WARHOL
WAY
GERSHWIN
TWAIN AVE.
MILANO CT.
MAGISTRATE
ROSSELLINI DRIVE
MEADOWRIDGE CT.
SAINT BARBARA BLVD.
GOLDEN MEADOW CT.
BARBARA ANN CT.
PANHELLENIC DR.
BLVD.
BRIGGS CT.
COMISKEY CRESCENT
COURT
WRIGLEY
FLETCHER'S CREEK
VICK
DRIVE
KNOTTY PINE GROVE
LANTERN FLY
AZTEC
HILL
SEDAN
SQUARE
WALK
PINE VALLEY CIR. CT.
LAMBE CT.
SPINNING WHEEL
CRES.
IRISH MOSS RD.
APPLETREE LN.
BASKERVILLE RUN
WHITE PINE
PARA PL.
TABBYMAN
AVOCADO
CRES.
DR.
HOLLOW ENVOY
OTHELLO CT.
JOHN
WATT BLVD.
SHAMROCK CIR.
GILLESPIE LN.
GASLAMP WAY
LESSARD LANE
GOODERHAM ESTATE
BLVD.
DAVIDSON WAY
GILLESPIE LN.
GABLEHURST CRES.
BARBERRY LN.
POND ST.
OLD MILL LN.
SECOND LINE
MAVIS
TIPPETT CT.
MACBETH
SPANISH MOSS TR.
HTS.
KAISER DR.
MAGISTRATE TERRACE
GARDEN
VALLEYROSE DR.
CAGLIANO DRIVE
VILLAGE WALK
KAISER WALK
ACUMEN CT.
DERRYDALE DRIVE
ASPENDALE CRES.
BENJAMIN COURT
SAINT BARBARA CREEK
DERRYCREST DRIVE
KING
TASSEL
BIRD CRES.
LANE
DOLLY TASSEL
MADAME ST.
NOVO STAR
CRES.
DR.
AMOUR TERRACE
VICAR GATE
OAKTREE CIRCLE
WAY
ARROWSMITH DR.
ROCCA
LONGVIEW PLACE
LONGSIDE DRIVE
MARITZ
CREEK
BUTTLE PLACE
ELLIOTT PARLIMENT STATION
HAINES ARTIST WAY
CRAWFORD MILL AVE.
GOODERHAM ESTATE BLVD.
GOLDEN
WAGON CRES.
JOHNSON
CAMPBELL SETTLER COURT
LOGANBERRY COURT
SILVERTHORN MILL AVENUE
SIMPSON PIONEER WAY
FARMER
SONG BIRD CRES.
VALIANT HEIGHTS
FLY CRES.
MONONAVI CT.
GYPSY
WESTERN SKIES
CRAIG CARRIER CT.
FLETCHER'S CREEK
ROTHSAY
AMARONE
RAYAH CT.
HUSH LN.
SETTLER ROW
SOMBRERO
BABY GRAN CT.
KAZOO CT.
VIOLA CT.
BRASS WINDS PLACE
SECOND LINE
ROAD
PLACE
ZINNIA
DIME
CRES.
MISSISSAUGA
Transportation and Works
Traffic Mgmt & Municipal Parking
Location Map– Twain Avenue
Zone 52
Ward 11
SCALE FOR REDUCED DRAWINGS
0m 57m 113m 226m 339m 452m 566m 1131m



MISSISSAUGA

Transportation and Works

Traffic Mgmt & Municipal Parking

Location Map– Erin Centre Boulevard
Zone 57
Ward 10

SCALE FOR REDUCED DRAWINGS

0m 57m 113m 226m 339m 452m 566m 1131m

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 2019/06/04

To: Chair and Members of General Committee

From: Geoff Wright, P. Eng., MBA, Commissioner of Transportation and Works

Originator's files: MG.23.REP

Meeting date: 2019/06/26

Subject

Extension and Increase to the Contract with Tacel Ltd. for the Supply and Delivery of Traffic Signal Controllers and Related Equipment, File Ref. Procurement No. FA.49.547-15

Recommendation

1. That Tacel Ltd. continue to be recognized as a single source vendor for the supply and delivery of City Standard traffic signal controllers and related equipment for the term ending December 31, 2019.

2. That the Purchasing Agent be authorized to extend the term and increase the upset limit for the existing contract with Tacel Ltd. in the amount of $1,497,549.00 (excluding taxes) to a revised total contract value of $2,960,257.20 (excluding taxes).

Report Highlights

- Traffic signal controllers and related equipment from Tacel Ltd. are an approved City Standard and have been supplied to the Tri-Party Agencies (City of Mississauga, City of Brampton and Region of Peel) for many years.
- The Advanced Traffic Management System (ATMS) implementation has resulted in a significant redesign of the traffic control cabinet. These design changes were required to accommodate future needs (i.e. bicycle signals, communication requirements, etc.).
- Tacel has consistently been the successful bidder, or only qualified bidder, to the extent that the equipment supplied by Tacel has become a standard for the entire Region of Peel.

Background

Council approved Tacel Ltd. as vendor of record (single source) for the Supply and Delivery of traffic signal controllers and related equipment for the period January 1, 2009 to December 31, 2012; reference GC-179-2009. At that time, the City had participated in co-operative

procurement processes for traffic controllers with the City of Brampton and the Region of Peel (Tri-Party) since the mid 1990's. Tacel was consistently the successful bidder, or only qualified bidder, to the extent that the equipment supplied by Tacel became a standard for the entire Region of Peel.

Council again approved Tacel Ltd. as a single source vendor for the Supply and Delivery of traffic signal controllers and related equipment for the period ending December 31, 2018, reference GC-579-2015.

This report seeks approval to continue to consider Tacel Ltd. as a single source vendor and to extend the term and increase the value of the existing contract with Tacel Ltd. to accommodate immediate needs for traffic signal controllers and related equipment required in 2019.

Comments

As a result of the Advanced Traffic Management System (ATMS) implementation, a significant redesign of the traffic control cabinet was undertaken. These design changes were required to accommodate future needs including bicycle signals, communication requirements, signal priority for fire/transit vehicles and additional Intelligent Transportation initiatives. The new specification consists of a 16 Phase TS1 Traffic Signal Cabinet, including modifications to the card rack assembly and the installation of a GPS antenna.

As a result of this significant redesign of the traffic control cabinet, the 2018 orders were delayed. These delays have resulted in additional units being required in 2019 to fulfill equipment orders.

The 2019 equipment requirements (Scope of Work), including pricing, are outlined in Appendix 1. The quantity requirements are derived from various capital projects and operational needs, including City Capital Road and Active Transportation projects, obligations under the Region of Peel Traffic Signal Operations and Maintenance Service Agreement, emergency, routine and life cycle needs.

In accordance with the Purchasing By-law #374-2006, Council approval is required for single source awards over $100,000.

The current market and options for procurement will be reviewed for future requirements.

Financial Impact

There are sufficient funds within the current operating and capital projects to accommodate the increase in contract value.

The value of the equipment purchases are captured within the Traffic Signal Inventory account #125215. As Equipment costs are incurred, they are recovered through various approved capital and operating budgets, as well as the Region of Peel or external agencies/parties.

The 2019 equipment requirements and project costs are included in Appendix 1.

Conclusion

Traffic signal controllers and related equipment from Tacel Ltd. are an approved City Standard and have been supplied for many years. Council has previously approved Tacel Ltd. as vendor of record for the Supply and Delivery of traffic signal controllers and related equipment which ended December 31, 2018, reference GC-579-2015. Tacel Traffic signal controllers and related equipment continue to be required in 2019 to fulfill outstanding requirements. It is recommended that the existing contract with Tacel Ltd. be extended and the value increased by $1,497,549.00 to accommodate 2019 requirements.

Attachments

Appendix 1: Statement of Work – Tacel Ltd., shall supply and deliver the following Traffic Control Cabinets and various related equipment FA.49.547-19 (All Wards)

Geoff Wright, P. Eng., MBA, Commissioner of Transportation and Works

Prepared by: Zvonimir Miller, Contract Coordinator, Traffic Signals

SUPPLY AND DELIVERY OF TRAFFIC CONTROL CABINETS AND VARIOUS RELATED EQUIPMENT - FA.49.547-15 Rev. #3				
Item #	Description	2018/19 Unit Price	2018/19 Quantity	2018 Total REF. Quote #G6305
1	8 Phase NEMA TS1 Traffic Controller MSpcl Cabinet	$0.00	0	$0.00
2	16 Phase NEMA TS1 Traffic Controller MSpcl Cabinet	0	0	$0.00
3	16 Phase NEMA TS1 Traffic Controller MSpcl Cabinet (SIMSYNC GPS & 28 ch Veh - 4 Ch Opt.)	$14,335.00	75	$1,075,125.00
4	16 Phase NEMA TS2 Traffic Controller MSpcl Cabinet	$0.00	$0.00	$0.00
5	EDI 510 Loadswitches	$33.30	900	$29,970.00
6	EDI LMD301 Vehicle Detector Shelf Mount	$0.00	0	$0.00
7	RENO C-1200 Vehicle Detector Rack Mount	$312.00	500	$156,000.00
8	EDI Oracle/2 Vehicle Detector Rack Mount	$281.00	250	$70,250.00
9	EDI BIU700 TS2 BIU, rack mount	$0.00	0	$0.00
10	EDI PS-200 TS2 Power Supply	$0.00	0	$0.00
11	EDI MMU2-16LEip-CAN 16ch -TS2 MMU with LCD display & Ethernet port	$0.00	0	$0.00
12	EDI SSM-12LEip-CAN 12ch -Conflict Monitor with LCD display & Ethernet port	$1,129.60	25	$28,240.00
13	EDI SSM-12LEip-CAN 6ch -Conflict Monitor with LCD display & Ethernet port	$992.40	110	$109,164.00
14	GPS Kit, SIMSYNC Antenna (RMC-DC-ATC-X3) & Cable DB25 Male - Supply Only	$720.00	40	$28,800.00
			Grand Total =	$1,497,549.00

MISSISSAUGA

Transportation and Works

Traffic Mgmt & Municipal Parking

Statement of Work - Tacel Ltd. shall supply and deliver the following Traffic Control Cabinets and Various Related Equipment - FA.49.547-19 (All Wards)

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 2019/06/18	Originator's files:
To: Chair and Members of General Committee	
From: Geoff Wright, P. Eng., MBA, Commissioner of Transportation and Works	Meeting date: 2019/06/26

Subject
Vacuum Leaf Collection Program Revised Criteria

Recommendation
1. That the Vacuum Leaf Collection Program continue with the existing criteria for inclusion in the program using a combination of the age of the subdivision, minimum of 35 years from assumption, as well as a visual inspection performed by staff, as outlined in the report from the Commissioner of Transportation and Works, dated June 13, 2019 and entitled "Vacuum Leaf Collection Program Revised Criteria".

2. That staff review and report back on the Vacuum Leaf Collection Program on expiration of the new contract, in approximately three-years time, as outlined in the report from the Commissioner of Transportation and Works, dated June 13, 2019 and entitled "Vacuum Leaf Collection Program Revised Criteria".

Report Highlights
- The Transportation and Works Department provides a Vacuum Leaf Collection Program (VLCP) to certain parts of the City to help prevent leaves from collecting in the road allowance and in city infrastructure, which increases the risk of flooding.
- The Region of Peel provides weekly yard waste collection for leaves from private trees, as part of their waste collection program.
- The Parks, Forestry and Environment Division maintains a database, which contains an inventory of all City-owned street trees and includes information such as species, age and size of every street tree within the City of Mississauga.
- Over a seven year span, the average annual gross cost of the VLCP has been approximately $1.4M. Recoveries are received from the Region, which lowers the net cost of the VLCP to the City with an average annual net cost of approximately $350,000.
- For the 2019 VLCP, staff are proposing to maintain the existing criteria for inclusion in the program, which is a combination of the age of the subdivision, minimum of 35 years from

assumption, as well as a visual inspection performed by staff. This criteria would include approximately 130 additional streets in the VLCP, bringing the total streets in the program to approximately 1,738, and have a gross cost of approximately $1.4M.

- Staff propose to award a three-year contract starting in the fall of 2019 and report back to General Committee at the termination of the contract to determine any changes that should be made to the contract going forward.
- A comprehensive communication plan will be required to support any of the five options presented, especially for those options where residents may no longer receive the service in 2019 and any year thereafter.

Background

At its meeting of September 13, 2017 Council approved the following recommendation:

"GC-0507-2017

1. That additional streets be included in the 2017 Vacuum Leaf Collection Program as outlined in the report from the Commissioner of Transportation and Works, dated August 22, 2017 and entitled 'Vacuum Leaf Collection Program – 2017 Overview'.

2. That staff report back on the feasibility of using biomass data to develop new criteria for incorporating new streets, and possibly maintaining existing streets, in the Vacuum Leaf Collection Program as outlined in the report from the Commissioner of Transportation and Works, dated August 22, 2017 and entitled 'Vacuum Leaf Collection Program – 2017 Overview'.

3. That the following additional streets be included in the 2017 Vacuum Leaf Collection Program:

a) Gladwyne Court – Ward 2
b) Vermillion Court – Ward 2
c) Westminster Place – Ward 3
d) Markwood Court – Ward 9
e) Markwood Place – Ward 9
f) Parkwood Place – Ward 5
g) Champlain Trail – Ward 5"

The purpose of this report is to report back on the feasibility of using biomass data to develop new criteria for incorporating new streets into the VLCP, as well as to consider other alternatives regarding the future of the VLCP.

Comments

VLCP Overview:

The VLCP commenced in the City of Mississauga at least 30 years ago. The original intent of the program was strictly to collect leaves in the fall that had collected in the ditches in ditched communities. Over time, the VLCP has grown into the program it now is. The VLCP is provided through the use of City staff and contractors.

The City of Mississauga's VLCP is a six-week program intended to help keep catch basins clear in areas with mature trees in the road allowance. The existing criteria for inclusion in the program is a combination of the age of the subdivision, minimum of 35 years from assumption, as well as a visual inspection performed by staff. Streets are placed into one of three zones. Each zone receives two pick-ups, three weeks apart.

The VLCP had approximately 1,653 streets included in the 2018 program. In the fall of 2018, staff sent an email update to the Mayor and Members of Council to include an additional 53 streets into the program. A copy of this email has been included as Appendix 1.

The Region of Peel also provides a yard waste collection program to all Mississauga residents. Residents can place their yard waste, including leaves, in paper waste bags or plastic containers at the curbside for collection.

Municipal Scan

Staff performed a municipal scan on neighbouring municipalities to confirm their operations for a loose leaf collection service. Of the 17 municipalities surveyed, only four have a limited collection area based on a range of criteria according to age of subdivision or inspection by staff. These municipalities are: Brampton, Kitchener, Oakville and Toronto.

It should be noted that Brampton's program faced similar challenges to Mississauga's when it was revised in 2009. Due to rising program costs, overlap with the Region's bagged collection program and inclement weather challenges, the program was changed to only provide loose leaf collection in the downtown core. At the time, the revised program resulted in an estimated annual savings of approximately $230,000.

Only three of the 17 municipalities surveyed have a city-wide program. These municipalities are: Burlington, Cambridge and Waterloo. All 17 municipalities offer a bagged yard waste collection program for their residents. A summary of these results has been attached as Appendix 2.

2019 VLCP

In addition to investigating the feasibility of using a biomass criteria, staff have reviewed four other options for consideration for the future of the VLCP, as noted below:

Option 1 – Maintain Existing VLCP Criteria

If the VLCP's existing eligibility criteria is maintained, an additional 785 residential streets will meet the criteria to be included in the program within 10 years. This will continue to add pressure to budget and resources in order to maintain levels of service. The number of new streets that would be included in 2019 would be 130. These streets have been listed in Appendix 3.

With this option, staff propose to award a three-year contract starting in the fall of 2019 and report back to General Committee at the termination of the contract to determine if any changes should be made to the contract going forward.

Option 2 – Implement Biomass Criteria

Diameter and species data can be used to calculate the biomass (amount of living matter as a unit volume, including leaves) created by the street trees on each City of Mississauga street.

Using the biomass data provided by the Parks, Forestry and Environment Division (PFE), staff performed calculations to compare the data and establish criteria for which streets would be included in the VLCP. The calculations take into account:

- Average biomass number of all streets currently in the VLCP
- Median biomass number of all streets currently in the VLCP
- Average biomass number for the streets added into the program in the last five years
- Average and median biomass number for streets that will meet the 35 year criteria in the next five and ten years
- Average and median biomass number for all streets in the City of Mississauga

The review compared data from the calculations listed above and data for streets that meet the 35 year criteria to determine a baseline of streets that would be included in the VLCP. The review also considered areas that are next to City owned woodlots, parks or trails to determine the impact of City trees on these residents.

After both a review of the data, as well as visual inspections, staff determined that a biomass benchmark of 3.0 be utilized as the criteria by which streets would be added to the VLCP. This benchmark of 3.0 represents the median for all streets included in the 2018 VLCP. Streets that have a biomass number above 3.0 would be included in the VLCP and those below the 3.0 biomass number would not be eligible for the VLCP.

The number of streets that would be included in this program using the above noted criteria would be approximately 1,900. The streets to be included in the program have been listed in Appendix 4. A list of streets that are being proposed to be removed from the program as well using biomass criteria are presented in Appendix 5. This would result in a net increase of 256 streets from the 2018 VLCP.

The information received from PFE indicates there is a slow growth of the tree canopy and biomass on an annual basis. Currently, this database is fully updated approximately every seven years given the slow growth rate of urban trees in southern Ontario, and the amount of work required to update and maintain the data. PFE is however, considering maintaining this data internally rather than by a consultant. This would mean the data could be updated more frequently, if required, and used as part of the VLCP criteria.

If this option was implemented, staff propose to review the program on a three-year basis as long as new data is available from PFE relating to the biomass of the city-owned trees.

The concern with this option is this criteria adds twice as many new streets into the program initially, similar to Option 1, which will place pressure on resources and budgets to maintain the service. The bio-mass criteria provides an arbitrary figure to identify streets that will be included into the program, similar to our existing program. There is nothing "scientific" about this option as staff must determine a basis for including streets using biomass, which is subjective or based on some rudimentary analysis. Biomass data therefore provides no more value than the existing criteria of using the age of the subdivision. This option will also be hard to administer and could cause confusion for residents as streets may be added and removed from the program on a three-year cycle depending on the biomass of the area.

Option 3 – Include Streets with Ditches Only

This option would include only streets that have ditched roads in the VLCP. This option aligns with the original intent of the VLCP, which has grown over time into what it is today. This option is also the most sustainable for resources and budgets. The number of streets that would be included in this program would be 245. This would remove approximately 1,400 streets that were included in the 2018 program. The streets to be included in this option have been listed in Appendix 6.

Option 4 – Status–Quo with Freeze on Adding More Streets

This option would hold the existing 1,653 streets currently in the VLCP. This option would eliminate the VLCP from expanding any further as it is becoming increasingly unsustainable for a city the size of Mississauga to continue to grow to maintain the VLCP. Residents would still be included in the yard waste collection program currently offered by the Region of Peel.

Option 5 – Do Entire City

This option would eliminate the use of criteria to include streets in the VLCP and provide the service to all residents. This option would place a strain on resources and budgets; however, it provides an equal opportunity for all residents to be included in the VLCP.

In partnership with Works Operations and Maintenance, Strategic Communications will assist in creating content and creative for the City's 2019 Vacuum Leaf Collection Program. Materials, including updated web content will provide a clear understanding about the program, the updated criteria, timing as well as what residents in service areas can expect before, during and after the collection.

Financial Impact

A financial summary showing the actual cost and recoveries for the VLCP from 2012 to 2018 has been attached as Appendix 7. Over this seven year span, the average annual gross cost of the VLCP program has been approximately $1.4M with an average annual net cost of approximately $350,000.

The rebate increase per tonne received from the Region of Peel in 2016 was $171.97 compared to $118.25 in 2015, which assisted in lowering the net cost of the program in 2016. The rebate received from the Region was maintained at $174.46 for 2017 and $177.42 in 2018. The rebate is a fluid value, which changes based on the cost incurred by the Region of Peel for their yard waste collection contractor.

The amount of tonnes collected doubled from 4,973 tonnes in 2017 to 9,829 tonnes in 2018. This was attributed to a snow storm during collection in November 2018, as well as a very wet collection season overall. The City's contractor costs to fulfill this program can fluctuate on an annual basis, as well, due to weather patterns, volume of leaves collected and timing of leaves falling.

The financial impacts of the options presented are estimated as follows:

- Option 1 – Maintain Existing VLCP Criteria: The proposed annual gross cost for this program would be approximately $1.4M and include 1,783 streets in the VLCP initially and would continue to increase as reviewed.

- Option 2 – Implement Biomass Criteria: The proposed annual gross cost for this program would be approximately $1.6M and include 1,900 streets in the VLCP, initially, and would continue to increase as reviewed.

- Option 3 – Include Streets with Ditches Only: The proposed annual gross cost for this program would be approximately $250,000 and include 245 streets in the VLCP.

- Option 4 – Status-Quo with Freeze on Adding More Streets: The proposed annual gross cost for this program would be approximately $1.4M and include 1,653 streets in the VLCP.

- Option 5 – Do Entire City: The proposed annual gross cost for this program would be approximately $3.0M and include 3,568 streets in the VLCP.

Conclusion

The Transportation and Works Department provides a VLCP to certain parts of the City to prevent leaves from collecting in the road allowance and/or City infrastructure, which can increase the risk of flooding. For the 2019 VLCP, staff are proposing to maintain the existing criteria for inclusion in the program, which is a combination of the age of the subdivision, minimum of 35 years from assumption, as well as a visual inspection performed by staff. This criteria would include approximately 130 additional streets in the VLCP, bringing the total streets in the program to approximately 1,783 streets, and have a cost of approximately $1.4M. The net cost to the City is difficult to estimate, and is dependent on the recoveries from the Region, which is influenced by the volume and weight of leaves collected as well as the value of the rebate.

The Region of Peel currently provides a yard waste program for all residents, which would still allow residents to have their leaves collected if they are bagged and placed curbside on their regular waste collection date. The Region's bagged program provides collection regardless of the severity of inclement weather, which is disadvantageous to the City's vacuum program, especially during the arrival of the winter season, when the same trucks are used for both vacuum collection and winter maintenance. In addition, there is a perceived overlap by the residents of similar services being offered by both the City and Region.

Attachments

Appendix 1: Email to Mayor and Council for Additional 53 Streets in the Program for 2018
Appendix 2: Summary of Municipal Benchmarking Scan
Appendix 3: Streets to be Included for Option 1 – Maintain Existing VLCP Criteria
Appendix 4: Streets to be Included for Option 2 – Implement Biomass Criteria

Appendix 5: Streets to be Removed for Option 2 – Implement Biomass Criteria
Appendix 6: Streets to be Included for Option 3 – Include Streets with Ditches Only
Appendix 7: Financial Summary – Actual 2012-2018 for VLCP

Geoff Wright, P. Eng., MBA, Commissioner of Transportation and Works

Prepared by: Scott Holmes, C.E.T., Senior Manager, Works Administration, Operations and Maintenance

Scott Holmes

From: Mickey Frost
Sent: 2018/09/14 4:26 PM
To: MC
Cc: LT; Scott Holmes
Subject: Update - Vacuum Leaf Collection Program
Attachments: Streets to be added 2018 VLCP.PDF; Corporate Report - Vacuum Leaf Collection Program - 2017 Overview.pdf

Madam Mayor and Members of Council:

The following is an update on the 2018 Vacuum Leaf Collection Program (VLCP) and the proposed plan for the VLCP moving forward.

As outlined in the report from the Commissioner of Transportation and Works (copy attached), dated August 22, 2017 and entitled "Vacuum Leaf Collection Program – 2017 Overview", which was approved by Council on September 13, 2017, staff are in the process of revising the criteria for inclusion in the VLCP to use bio mass data rather than the existing criteria of 35 years since subdivision registration as well as a satisfactory visual site inspection. The follow up report to General Committee was not undertaken in early 2018, as mentioned in the attached report, since the City's current VLCP contract expires on December 31, 2018 and it is not cost-effective to make any fundamental changes to the contract at this time.

Bio mass data is the amount of living matter as a unit volume, including leaves. This will ensure we will have streets included in the program based on scientific values rather than only age of subdivision. The data will take into consideration streets that have been affected by the 2013 ice storm, and the Emerald Ash Borer and Asian Longhorn Beetle infestations.

Staff from Works Operations and Maintenance, and Parks and Forestry, have partnered to determine the new criteria for the VLCP using bio mass data. Staff will report to General Committee in early 2019 on the new VLCP using bio mass data as the measure of inclusion, indicating the streets that will be included in the new VLCP as well as those streets that would be excluded from the VLCP for not meeting the new bio mass data criteria.

In the meantime, for the 2018 VLCP staff will continue to use the existing criteria since the City's current VLCP contract expires on December 31, 2018; and, to ensure Council approval has been obtained before any changes are made to the inclusion criteria and related impact on streets to be serviced using the new bio mass data-based criteria, particularly to streets that previously had service and now would not.

Using the existing criteria, an additional 50 streets will be added to the 2018 VLCP, bringing the total number of streets serviced to approximately 1,650. Staff have attached a list showing the proposed additional streets to be added to the 2018 VLCP by zone and Ward, for your reference. Our existing resources of both internal workers and contractors can accommodate the additional streets to be included in the 2018 VLCP.

Should you require further information or assistance on the VLCP, please contact Scott Holmes, Senior Manager, Works Administration, Operations and Maintenance, or myself.

Thank you,

Mickey Frost, HBA; CPA, CGA; MPA
Director, Works Operations and Maintenance
T 905-615-3200 ext.4020
mickey.frost@mississauga.ca

City of Mississauga | Transportation and Works,
Works Operations and Maintenance Division

Streets to be Added to the 2018 VLCP						
Street	**Zone**	**Ward**				
CARIBBEAN CRT	Z 28	4		**Street**	**Zone**	**Ward**
RAYFIELD CRT	Z 28	4		EASTRIDGE RD	Z 46w	9
				*MONTEVIDEO RD	Z 46w	9
Street	**Zone**	**Ward**		SYMINGTON CRT	Z 46w	9
HUNTINGFIELD DR	Z 37e	5		TRIPOLI TERR	Z 46w	9
				VALENCIA RD	Z 46w	9
				*Section north of Battleford Rd.		
Street	**Zone**	**Ward**				
BUCKINGHAM CT	Z 30	6				
GUILD CT	Z 30	6		**Street**	**Zone**	**Ward**
HEATHERWOOD SQ	Z 30	6		ALFRESCO TERR;	Z56	9
OXFORD SQ	Z 30	6		BRACKNELL CRES	Z56	9
WAKEFIELD CRES	Z 30	6		CORDINGLEY CRES	Z56	9
WOBURNWOODS LN	Z 30	6		DANTON	Z56	9
				DOLMAGE CRT	Z56	9
Street	**Zone**	**Ward**		EUROPA CRT	Z56	9
ALDERMEAD RD	Z 31	8		GANYMEDE RD	Z56	9
BADMINTON DR	Z 31	8		HARLOW RD	Z56	9
BEAUFORT TERR	Z 31	8		HARRIS CRES	Z56	9
HAYDOCK PARK DR	Z 31	8		HARRIS RD	Z56	9
KEMPTON PARK DR	Z 31	8		HICKLING CRES	Z56	9
MINSTREL MEWS	Z 31	8		HILLIS CRT	Z56	9
MOOREVALE CRT	Z 31	8		MILLER'S GROVE	Z56	9
PHOENIX PARK CRES	Z 31	8		OLYMPUS MEWS	Z56	9
PIMLICO CRT	Z 31	8		PLUM TREE CRES	Z56	9
SANDOWN RD	Z 31	8		RUNCORN ROW	Z56	9
SEDGEFIELD RD	Z 31	8		SPRING CREEK	Z56	9
TEESIDE CRT	Z 31	8		STEVENAGE CRT	Z56	9
THE CHASE	Z 31	8		SUNDOWN CIR	Z56	9
THE GALLOPS	Z 31	8		VANDERBILT RD	Z56	9
WINCANTON CRES	Z 31	8				
WINDSOR WAY	Z 31	8		50 New streets to be added in 2018		

Municipality	Loose Leaf Collection Service?	Inclusion Criteria for Loose Leaf Collection	Comments/Notes
Aurora	No	N/A	Residents can bag leaves and put bags out as yard waste. Biweekly service, April to November. Residents can also drop off loose leaves at several depots.
Barrie	No	N/A	Residents can bag leaves and put bags out as yard waste, weekly service in January, April, May, June, September, October, and November. Biweekly service in July, August and December. No collection in February and March. Residents can also drop off loose leaves at a landfill.
Brampton	Yes	Fall Leaf Vacuum Program is limited to downtown Brampton on the basis of staff's historical knowledge of areas with high leaf fall volumes.	Service is provided three times per qualified street, October to December (weather dependent). Residents throughout the City can also bag leaves and put them out as yard waste collected by the Region of Peel.
Burlington	Yes	City-wide.	Service is provided once or twice per street depending on leaf fall volumes. Loose Leaf Collection Program occurs in November and December (weather dependent). Residents can also bag leaves and leave bags curbside as yard waste for pickup by the Region of Halton, April to December.
Cambridge	Yes	City-wide.	Service is provided once per street. Loose Leaf Collection program takes place from October to November and lasts approximately 4 weeks (weather dependent). Residents can also bag leaves and leave bag curbside for biweekly pickup by the Region of Waterloo, March to November.
Hamilton	No	N/A	Residents can place leaves in bags or containers and place bags/containers out as yard waste. Weekly pickup year-round.

Municipality	Loose Leaf Collection Service?	Inclusion Criteria for Loose Leaf Collection	Comments/Notes
Kitchener	Yes	Certain areas based on staff knowledge of historical leaf fall volume.	Service is provided as many times as needed in areas with high leaf fall volume (weather dependent). Areas with a medium-level of leaf fall volume are serviced once in November. Areas without loose leaf collection have bagged curbside collection picked up by the Region of Waterloo, March to November. Residents, in addition to loose leaf or bagged collection services, can also drop off loose leaves at several depots.
London	No	N/A	Residents can bag leaves and put the bags out as yard waste every 6 weeks from March to October. Curbside collection occurs twice in October, and once in November and December. Residents may also drop off bags of leaves at depots.
Markham	No	N/A	Residents can bag leaves and put the bags out as yard waste every other week from April to December. Residents may also drop off bags of leaves at several facilities.
Milton	No	N/A	Residents can bag leaves and leave bags curbside as yard waste for pickup by the Region of Halton, April to December. Residents may also drop off bags of leaves at a waste
Oakville	Yes	Subdivisions 25 years and older with mature trees together with visual inspection about signficant leaf fall.	Loose leaf collection program takes place in the Spring, April-May, and in the Fall, October-November (weather dependent). Residents can also bag leaves and leave bags curbside as yard waste for pickup by the Region of Halton, April to December.
Oshawa	No	N/A	Residents can bag leaves and put the bags out as yard waste. Biweekly service April-late November.
Ottawa	No	N/A	Residents can bag leaves and put the bags out as yard waste. Weekly service year-round.
Richmond Hill	No	N/A	Residents can bag leaves and put the bags out as yard waste. Biweekly service April to October. Weekly service October to December.
Toronto	Yes	Parts of East York, Etobicoke, North York, and Scarborough based on staff's historical knowledge of areas with high leaf volume.	One pass through each street. Mechanical leaf collection program takes place November to December (weather dependent). Residents can also bag leaves and put the bags out curbside as yard waste where they will be collected on specified dates throughout the fall.

Municipality	Loose Leaf Collection Service?	Inclusion Criteria for Loose Leaf Collection	Comments/Notes
Vaughan	No	N/A	Residents can bag leaves and put them out as yard waste. Weekly pickup April to June. Bi-weekly pickup June to October. Weekly pickup October to December.
Waterloo	Yes	City-wide.	At lease one pass through each street. Residents can also bag leaves and leave bags curbside for biweekly pickup by the Region of Waterloo, March to November.

Streets to be added to the VLCP with Existing Criteria for 2019		
Clarkson		
Zone	**Street**	**Ward**
13	HEDGE DR	1
8-54	MISSISSAUGA RD	1
7	THE THICKET	1
16	ALMIRA CRT	7
16	BEAVERBROOK WAY	7
16	CHISHOLM AVE	7
14	CREELMAN RD	7
14	FLORIAN RD	7
16	GERAN CRES	7
16	HURONDALE DR	7
16	OLINDA CRT	7
16	POLLARD DR	7
16	SAINT ANDREWS PL	7
17	TIPPERARY CRT	8
Mavis		
Zone	**Street**	**Ward**
22-59	BURNHAMTHORPE RD W	3
26	CORKSTONE GLADE	3
19-26	FIELDGATE DR	3
19-27	GOLDEN ORCHARD DR	3
27	GRYPHON MEWS	3
27	IDEAL CRT	3
27	LEE DR	3
27	PASCAL CRT	3
27	PRESTON TR	3
26	ROWNTREE CRT	3
27	SCOTTSBURG CRES	3
27	SCOTTSBURG CRT	3
27	STARLIGHT CRES	3
27	SUGAR MAPLE CRT	3
27	TYNEGROVE RD	3
27	VINTNER DR	3
27	WESTMINSTER PL	3
27	WETHERBY LANE	3
27	WINDCROFT CRT	3
28	ABERFOYLE CRT	4
28	ANGELONI DR	4
28	ASHRIDGE PL	4
28	BUD GREGORY BLVD	4
28	CAMDEN CIR	4
29	FOUNDERS WALK	4
28	FULL MOON CIR	4
29	HARROWSMITH DR	4
29	HEARTHSIDE DR	4
29-37E	HERITAGE HILLS BLVD	4
29	HILLBURY DR	4

29	HUNTINGTON RIDGE DR	4
29	JETHRO CRT	4
28	LAURENTIAN AVE	4
28	MALLORYTOWN AVE	4
28	PEMMICAN TR	4
28	PETAWAWA CRES	4
29	POTOMAC CRT	4
29	ROCKCLIFFE GDNS	4
28	WAGONWHEEL CRT	4
29	WESTBOURNE TERR	4
29	WEYMOUTH COMMONS CRES	4
29	WINFIELD TERR	4
28	WOODINGTON DR	4
30	APPLE GATE CRT	6
30	BUCKINGHAM CRT	6
30	GUILD CRT	6
30	OXFORD SQ	6
30	WAKEFIELD CRES	6
30	WOBURN WOODS LANE	6
22-23	CENTRAL PKY W	7
22	DRAGON DR	7
22	HANSON RD	7
22	LECH WALESA DR	7
22	MELVILLE AVE	7
22	PALGRAVE RD	7
22	SURBRAY GROV	7
31	BADMINTON DR	8
58	BARWELL RD	8
31	BEAUFORT TERR	8
58	BERTRAND RD	8
24	CAVERLY CRT	8
58	CHADBURN CRES	8
58	CHARTRAND CRES	8
58-59	COLONIAL DR	8
31	DELDERFIELD CRES	8
58	DOLSON CRT	8
58	DRUMMOND RD	8
58	FARNSWORTH CRES	8
24	FIFESHIRE CRT	8
58	GALBRAITH DR	8
24	GLAMIS CRT	8
58	HALSTEAD RD	8
58	HARGROVE RD	8
58-59	LOYALIST DR	8
58	MELFORT CRES	8
31	MOOREVALE CRT	8
58	OSBOURNE RD	8
58	PRENTISS RD	8
24	PROMONTORY CRES	8
24-31	PROMONTORY DR	8
58	RENFREW CRES	8
58-59	RIDGEWAY DR	8

58	ROSSLAND CRES	8
58	RUSHTON CRES	8
58	SANCREST CRT	8
58	SEEBRING CRES	8
24	SELKIRK PL	8
24	STRATHROY CRT	8
31	TATTERSALL WAY	8
58	THORNCREST DR	8
58	UNITY DR	8
32	UNITY GATE	8
58	VARDEN CRT	8
58	WILMAR CRES	8
Malton		
Zone	**Street**	**Ward**
36W	CANITAL CRT	5
36W	CHIEFTAN CIR	5
36W	DAKOTA RD	5
36W	DELAWARE DR	5
47	FINERY CRES	5
36E-51	KENNEDY RD	5
47	KEY CRT	5
36W	NAHANI WAY	5
36W	OJIBWAY TR	5
36W	PEBBLEBROOK CRT	5
48E	PENNY LANE	5
47-48E	SIGSBEE DR	5
36W	TAILFEATHER CRES	5
36W	TUSCADERO CRES	5
Meadowvale		
Zone	**Street**	**Ward**
39E	BELCARO WAY	11
39E	BREMEN LANE	11
39E	HILLSIDE DR	11
39E	MULLET DR	11
39E	PAGOSA CRT	11
39E	SHANDWICK PL	11
39E	SONNET CRT	11
39E	VANTAGE CIR	11

Streets to be Included with Biomass Criteria for 2019		
Clarkson		
Zone	**Street**	**Ward**
2	Chaucer Ave.	2
2	Burns Av.	2
2	Tennyson Ave.	2
2	Sangster Ave.	2
2	Longfellow Ave.	2
2	Roper Ave.	2
2	Whittier Ave.	2
2	McConnell Ave.	2
2	Stockwell Ave.	2
Mavis		
Zone	**Street**	**Ward**
19	Knob Hill	3
19	Fairfox Cres.	3
19	Treadwells Dr.	3
21	Kaneff Cres.	4
21	Kirwin Ave.	7
22	Anastasia Terr.	7
22	Pilcom Cres.	7
22	Pilcom Crt.	7
22	Nanak Rd.	7
22	Nanak Crt.	7
22	Luzon Cres.	7
22	Naomi Cres.	7
22	Italia Cres	7
22	Commonwelth Cir.	7
22	Redmond Rd.	7
22	Malaga Rd.	7
22	Africa Cres.	7
22	Copermocis Dr.	7
22	Croatia Dr.	7
22	Riel Dr.	7
22	Nablus Gt.	7
22	Macedonia Cres.	7
22	Walford Crt.	7
22	Karia Dr.	7
22	Archill Cres.	7
22	Omeath Crt.	7
22	Hanson Rd	7
22	Surbray Grove	7
22	Lech Walesa Dr.	7
22	Dragon Dr.	7

22	Ukrane Rd.	7
27	Emerald Gate	3
27	Forest Fire Ln.	3
27	Forest Fire Cres.	3
27	Sunset Valley Crt.	3
27	Willowbank Trail	3
27	Shelby Cres.	3
27	Lingfield Cres.	3
27	Greycedar Cres.	3
27	Greycedar Crt.	3
27	Silverhaze Rd.	3
28	Angeloni Dr.	4
28	Ashridge Crt.	4
28	Bishopstroke Ln.	4
28	Dursley Cres.	4
28	Clevedon Dr.	4
28	Midhurst Ln.	4
28	Dunmow Cres.	4
28	Kelvedon Mews	4
28	Curia Cres.	4
28	Amhurst Cres.	4
28	Oxbow Cres.	4
28	Antelope Cres.	4
28	Owl Circle	4
28	Gatineau Ave.	4
28	Tribal Crt.	4
28	Washago Crt.	4
28	Gullfoot Circle	4
28	Aberfoyle Crt.	4
28	Camden Circle	4
28	Full Moon Circle	4
28	Petwawa Cres.	4
28	Mallorytown Ave.	4
28	Pemmican Tr.	4
28	Gregory Blvd.	4
28	Kettleby Crt.	4
28	Wagonwheel Crt.	4
28	Laurentian Ave	4
29	Guildwood Way	4
29	Nisbet Court	4
29	Yorkminster Cres	4
29	Thamesford Terr	4
29	Dinsmore Court	4
29	Waterford Cres	4
29	Ashley Ave	4
29	Farwell Cres	4
29	Sugarbush Road	4

29	Maripose Lane	4
29	Squire Court	4
29	Greenpark Cres	4
29	Schneider Court	4
29	Russo Court	4
29	Tea Garden Circle	4
29	Chelmsford Court	4
29	Hartfordshire Lane	4
29	Pavillion Court	4
29	Wallenberg Cres	4
29	Parkview Blvd	4
29	Turnbridge Road	4
29	Curran Place	4
29	Arbutus Way	4
29	Weymouth Commons	4
29	Hearthside Dr	4
29	Rockcliffe Gardens	4
29	Mayflower Drive	4
29	Whitelodge Cres	4
29	Kingston Court	4
29	Jenkins Cres	4
29	Cordoba Court	4
29	Bismark Cres	4
29	Dundin Cres	4
29	Empire Cres	4
29	Founders Walk	4
29	Heritage Hills Blvd	4
29	Westbourn Terrace	4
30	Crosscreek Court	6
30	Wayside Court	6
30	Silversmith Drive	6
30	Carpenter Court	6
30	Springwater Cres	6
30	Gladebrook Cres	6
30	Stonemill Court	6
30	Grassland Cres	6
30	Andiron Court	6
30	Violet Road	6
30	Beautybush Court	6
30	Roseglen Court	6
30	Rosewater Court	6
30	Santa Rosa Court	6
30	Silky Rose Court	6
30	Royal Rose Court	6
30	Rose Haven Road	6
30	Quinpool Court	6
30	Murray Hill Cres	6

30	Lucerne Cres	6
30	Whispering Wood Drive	6
30	Lastrada Heights	6
30	Erindale Station Rd	6
30	Natkarni Cr	6
30	Willow Creek Dr	6
31	Thorny-Brae Pl	8
31	Covington Terr	6
31	Flamborough Cir	6
31	Ballantrae Dr	6
31	Credit Pointe Dr	6
31	Hewick's Lane	6
31	Glastonbury Pl	6
31	Heathfield Mews	6
31	Spinningdale Crt	6
31	Tillingham Gdns	6
31	Wells Borough Pl	6
32	Lindholm Crt	8
32	Ambercroft Tr	8
32	Credit Valley Rd	8
32	Kimbermount Ave	8
32	Innisfil Rd	8
32	Longmoor Rd	8
32	Romfleild Cres	8
32	Donegal Dr	8
32	Mashdale Crt	8
32	Metcalfe Ave	8
32	Bay Vella Ave	8
32	Radisson Cres	8
32	Travistock Crt	8
32	Inchbury Rd	8
58	Dayfoot Drive	8
58	Fulwell Road	8
58	Dunoon Drive	8
58	Glasshill Gr.	8
58	Columbo Crescent	8
58	Chartrand Crescent	8
58	Hargrove Road	8
58	Bertrand Road	8
58	Halstead Road	8
58	Rushton Crescent	8
58	Renfrew Crescent	8
58	Wilmar Crescent	8
58	Rossland Crescent	8
58	Varden Court	8
58	Osbourne Road	8
58	Darwell Road	8

58	Farnsworth Crescent	8
58	Chadburn Crescent	8
58	Prentiss Road	8
58	Seebring Crescent	8
58	Sancrest Court	8
58	Dolson Court	8
59	Ingram Road	8
59	Jackpine Road	8
59	Bethune Road	8
59	Huxley Drive	8
59	Cartmel Road	8
59	Keslo Crescent	8
59	Prince Court	8
59	Ketchum Court	8
59	St. Laurent Court	8
59	Stratton Woods Court	8
59	East Park Court	8
59	Stratton Woods Gate	8
59	Cornish Road	8
59	Loyalist Drive	8
59	Baird Court	8
59	Harvey Crescent	8
59	Pettigrew Crescent	8
59	Fenwick Crescent	8
59	Charlebrook Court	8
59	Cherrington Crescent	8
59	Aubrey Road	8
59	Dovetail Mews	8
59	McMaster Road	8
59	Coldstream Road	8
59	Turnstone Crescent	8
59	Dover Crescent	8
59	Cajun Crescent	8
59	Burgess Drive	8
59	Marmac Crescent	8
59	Mulcaster Road	8
59	Valcourt Crescent	8

Malton

Zone	Street	Ward
36W	Cortian Cres	5
36W	Whithler Cres	5
36W	Cosmic Cres	5
36W	Windy Hill Crt	5
36W	Dalmuir Mews	5
36W	Dakota Rd	5
36W	Chieftan Cir	5
36W	Tailfeather Cres	5

36W	Canital Crt	5
36W	Ojibway Trail	5
36W	Tuscadero Dr	5
36W	Ferret Crt	5
36W	Calnsman Trail	5
36W	Palomino Dr	5
36W	Trailwood Dr	5
36W	Cree Lane	5
37W	Sparkwell Dr	5
37W	Avonwick Ave	5
37W	Shillington Dr	5
37W	Talaton Trail	5
37W	Spangler Dr	5
37W	Tipton Crt	5
37W	Langport Crt	5
37W	Four Winds Way	5
37W	Menton Crt	5
37W	Fleur De Lis Crt	5
37W	Bourget Dr	5
37W	Roselaire Trail	5
37W	Lafayette Dr	5
37W	Savoy Cres	5
37W	Esprit Cres	5
37W	Patriot Dr	5
37W	Parkwood Pl	5
37W	Amesury Ave	5
37W	Stableford Terr	5
37W	Bluesky Cres	5
37W	Palomar Cres	5
37W	Sunray Dr	5
37W	Winterton Way	5
37W	Whitfield Terr	5
37W	Astwell Ave	5
37W	Richborough Dr	5
37W	Sundial Crt	5
37W	Sunrise Crt	5
37W	Northern Lights Cir	5
37W	Ceremonial Dr	5
37W	Ashprior Ave	5
37E	Firebird Trial	5
37E	Blackfoot Trail	5
37E	Glenn Hawthorne Blvd	5
37E	Springbrooke Cres	5
37E	Nishga Crt	5
37E	Salishan Cir	5
37E	Swiftcurrent Trail	5
37E	Roebuck Crt	5

37E	Wendron Cres	5
37E	Assiniboine Trail	5
37E	Naskapi Court	5
37E	Micmac Cres	5
37E	Baggetta Cres	5
37E	Heritage Hill Blvd	5
37E	Silverthorne Cres	5
37E	Everton Dr	5
37E	Willowood Dr	5
Meadowvale		
Zone	**Street**	**Ward**
37W	Winterton Way	11
38W	Arch Rd	6
38W	Earl St	6
38W	Joseph St	6
38W	Amity Rd	6
38W	River Rd	6
38W	Astrella Cres	6
38W	Ladyburn Cres	6
38W	Evenstarr Crt	6
38W	Rebecca Crt	6
38W	Kingsbank Crt	6
38W	Riverdale Cres	6
38W	Squall Crt	6
38W	Meadowflield Cres	6
38W	Moongate Cres	6
38W	Colby Crt	6
38W	Riverside Pl	6
38W	Coldwater Mews	6
38W	Oldcastle Cres	6
38W	Brightpool Cres	6
38W	Goldenbrook Dr	6
38W	Villageview Pl	6
38W	Stillriver Cres	6
38W	Mistburn Crt	6
38W	Summergrove Cres	6
38W	Wintergrove Gdns	6
38W	Evenside Cres	6
38W	Kirkrow Cres	6
38W	Calais Crt	6
38W	Riverbend Crt	6
38W	Poets Walk	6
38W	Durie Rd	6
38W	Giacco Crt	6
38W	Edencroft Cres	6
38W	Baymill Crt	6
38W	Sagwood Crt	6

38W	Manorbrook Crt	6
38W	Hidden Valley Crt	6
38W	Princelea Pl	6
38W	Chiddingstone Cir	6
38W	Rundle Crt	6
38W	Wyndham St	6
38W	Cartire Crt	6
38W	Riverway Cres	6
38E	Taw Ave	6
38E	Razorbill Crt	6
38E	Barleymow St	6
38E	Lismac Blvd	6
38E	Cinnamon Rd	6
38E	Blizzard Rd	6
38E	Alicante St	6
38E	Charminster Cres	6
38E	Buttermill Crt	6
38E	North Mill Crt	6
38E	Castlefield Dr	6
38E	Warwickshire Way	6
38E	Daniel Creek Rd	6
39W	Picton Pl	9
39W	Gardenview Cres	9
39W	Tweed Crt	9
39W	Dalebrook Cres	9
39W	Quail's Run	9
39W	Tayside Cres	9
39W	Scarath Crt	9
39W	Wokham Crt	9
39W	Advent Crt	9
39W	Raglan Crt	9
39W	Middlebury Dr	9
39W	Haddon Hall Rd	9
39W	Holbrook Rd	9
39W	Banfield Rd	9
39W	Willowburne Dr	9
39W	Charlotte Crt	9
39W	Burford Trail	9
39W	Harbour Dr	9
39W	Fieldon Rd	9
39E	Vail Crt	11
39E	Manor Hill	11
39E	Ridge Dr	11
39E	Hilton Crt	11
39E	Tiffany Crt	11
39E	Fry Brook Crt	11
39E	Forest hill Dr	11

39E	Mont Claire Dr	11
39E	Rose Gate Dr	11
39E	Mont Crest Crt	11
39E	Rothesay Crt	11
39E	Elderview Crt	11
39E	Warrendale Gate	11
39E	The Chase	11
44W	Boyer Boulevard	11
45W	Argentia Road	11
45W	Creditview Road	11
45W	Stancombe Crescent	11
45W	Hollywell Avenue	11
45W	Sir Monty's Drive	11
45W	St. Ives Way	11
45W	Tillsdown Drive	11
45W	Camgreen Circle	11
45W	Roxbury Road	11
45W	Kirkby Lane	11
45W	Organdal Drive	11
45W	Hamsmere Lane	11
45E	Diamond Court	11
45E	Estes Crescent	11
45E	Deacon Court	11
45E	Bancroft Drive	11
45E	Emerson Lane	11
45E	Whitewater Lane	11
45E	Equity Court	11
45E	Bankhead Court	11
45E	Killaby Drive	11
45E	Hardesty Crescent	11
45E	Tremaine Court	11
45E	Douguy Boulevard	11
45E	Ewing Crescent	11
45E	Swinbourne Drive	11
45E	Duford Drive	11
45E	Dendron Street	11
46W	Gananoque Drive	9
46W	Bilboa Lane	9
46W	Formentera Avenue	9
46W	Treviso Court	9
46W	Treviso Terrace	9
46W	Atherly Crescent	9
46W	Lorca Crescent	9
46W	Crickadorn Court	9
46W	Chadmont Crescent	9
46W	Arles Mews	9
53	Gazette Gate	11

53	Inuit Trail	11
53	Frontier Ridge	11
53	Waldorf Way	11
53	Wiffletree Court	11
53	Quest Circle	11
53	Visor Gate	11
53	Godwick Drive	11
53	Dishley Court	11
53	Hemingford Lane	11
53	Torrisdale Lane	11
53	Stockbridge Court	11
53	Banffshire Court	11
53	Samuelson Circle	11
53	Midlington Gate	11
53	Avon Drive	11
53	Kentchester Place	11
53	Stevington Crescent	11
53	Hallsands Drive	11
53	Overstone Lane	11
53	Windscale Lane	11
53	Sunthorpe Lane	11
53	Woodhenge Way	11
53	Danthorpe Drive	11
53	Drumcashel Court	11
53	Upton Crescent	11
53	Bannockburn Court	11
53	Branigan Gate	11
54	Gulfstream Way	9
54	Windrush Court	9
54	Tradewind Drive	9
54	Seabreeze Drive	9
54	Windbreak Court	9
54	Strata Court	9
55	Cloverleaf Court	10
55	Aldergrove Court	10
55	Pebblewood Road	10
55	Avalon Drive	10
55	Baywood Court	10
55	Dunrobin Way	10
56	Banff Court	10
56	Tenth Line West	10
56	Snow Goose Lane	10
56	Mockingbird Mews	10
56	Pintail Circle	10
56	Nutcracker Drive	10
56	Nighthawk Trail	10
56	Snowflake Lane	10

56	Longspur Road	10
56	Prairie Circle	10
56	Saltmarsh Court	10
56	Sundew Court	10
56	Greenbelt Crescent	10
56	Columbine Crescent	10
56	Gemini Crescent	10
56	Lady Slipper Court	10

Appendix 5

Streets to be Removed with Biomass Criteria for 2019		
Clarkson		
Zone	**Street**	**Ward**
1	Goodwin Rd.	1
2	Crozier Crt	2
3	Orr Rd.	2
3	Apple Ln.	2
5	Liveoak Dr.	1
5	Winterhaven Rd.	1
5	Skyline Dr.	1
5	Rometown Dr.	1
5	Parkridge Rd.	1
6	Alexander Ave.	1
6	Ninth St.	1
6	Tenth St.	1
6	Delco Ave.	1
6	Delco Crt.	1
6	Sixth St.	1
6	Northmount Ave	1
6	Pelham Ave.	1
6	Sawyer Ave.	1
6	Third St.	1
6	Gardner Ave.	1
6	Strathy Ave.	1
7	Queen St. E.	1
7	Rosewood Ave.	1
7	Carlis Pl.	1
7	Rosevelt Rd.	1
7	Troy St.	1
7	Drumgray Ave.	1
7	Marf Ave.	1
7	Elaine Tr.	1
7	Orano Ave.	1
7	Ridgemount Cres.	1
7	Northaven Dr.	1
7	Arbor Rd.	1
7	Cawthra Crt.	1
7	Kipper Ave.	1
8	Queen St. E.	1
8	Harrison Ave.	1
8	Pine Ave.	1
8	Wesley Cres.	1
8	Kane Rd.	1
8	Knareswood Dr.	1

8	Mississauga Cres.	1
9	Front St. S.	2
9	Glenhill Cres.	2
9	Gregwood Rd.	2
9	Chrisede Dr.	2
10	Deanhome Rd.	2
10	Johnson's Ln.	2
10	Sabina Crt.	2
11	Benedet Dr.	2
11	Sandgate Cres.	2
11	Lundgan Dr.	2
11	Bodmin Rd.	2
11	Fontwell Cres.	2
11	Halkirk Crt.	2
11	Bodley Rd.	2
11	Sherhill Dr.	2
11	Harman Crt.	2
11	Tredmore Dr.	2
11	Brookhurst Rd.	2
12	Loreland Ave.	1
12	Nida Crt.	1
13	Melton Crt.	1
13	Hedge Dr.	1
13	Cody Ln.	1
13	Snow Cres.	1
14	Abington Ave.	7
14	Crewenan Rd.	7
14	Frayne Crt.	7
14	Pearl Tree Rd.	7
15	Appledore Cres.	7
15	Carl Anne Pl.	7
15	Cullen Ave.	7
15	Dorothea Crt.	7
15	Kenbarb Rd.	7
15	Mervette Crt.	7
15	Trident Ave.	7
15	Courrier Ln.	7
15	Richardson's Rd.	7
15	Dunbar Rd.	7
15	Rugby Rd.	7
15	King St. W.	7
16	Sharon Cres.	7
16	Conquest Dr.	7
16	Ravensthorpe Cres.	7
16	Fredonia Dr.	7
16	Sami St.	7
16	Parmeer Dr.	7

16	Hemus Sq.	7
16	Paisley Blvd.	7
16	Morrison Ave.	7
16	Chisholm Crt.	7
16	Oneida Cres.	7
16	Shardawn Mews	8
17	Rathlin Crt.	8
17	Hammond Rd.	8
17	knight's Crt.	8
18	Barnstone Cres.	2
18	Hornsgate Dr.	2
18	Frankfield Rd.	2
18	Danube Crt.	2
18	Opal Crt.	2
18	Summerwood Crt.	2
18	Liruma Rd.	2
Mavis		
Zone	**Street**	**Ward**
19	Gatliff Ave.	3
19	Haven Glenn	3
19	Nobleton Dr.	3
20	Wisner Rd.	3
20	Lexicon Dr.	3
20	Streamway Cres.	3
20	Riverspray Cres.	3
20	Burningoak Cres.	3
20	Syeston Crt.	3
20	Bluestream Cres.	3
20	Greyowl Pnt.	3
20	Silver Spear Rd.	3
20	Media Crt.	3
20	Gripsholm Rd.	3
20	Riley Crt.	3
21	Burdock Pl.	4
21	Acala Cres.	4
21	Cliff Rd. N.	4
21	Galedowns Crt.	4
21	Silver Creek Blvd.	4
23	Ibbetson Cres.	6
23	Forestwood Dr.	6
23	Stainton Dr.	6
23	Frobex Crt.	6
23	McBride Ave	6
24	Winglos Crt.	6
24	Orion Cres.	6
24	Queenston Dr.	6

24	Rooney Gate	6
24	Barchester Crt.	8
24	Glencolin Crt.	6
25	Council Ring Rd.	8
25	Spruce Needle Crt.	8
25	Greenbower Crt.	8
25	Windjammer Rd.	8
25	South Millway	8
26	Rathburn Rd. E.	3
26	Poltava Cres.	3
26	Carscadden Chase	3
27	Highgate Dr.	3
27	Ideal Crt	3
27	Corbet Dr.	3
27	Lovingston Cres.	3
30	Sagebush Trail	6
30	Magnolia Court	6
30	Queensbridge Drive	6
30	Chicory Court	6
30	Ashburnam Place	6
30	Carrying Place	6
30	Sawgrass Cres	6
31	Aldermead Rd	8
31	The Chase	8
31	Haydock Park Way	8
31	Stonemason Cres	8
31	Sawmill Valley Dr	8
31	Badminton Dr	8
31	Tattersall Way	8
32	Folkway Way	8
32	Pheasant Run	8
32	Barbican Rd	8
32	Bellwood Crt	8
32	Flitter Crt	8
32	Cathian Crt	8
32	Arbour Green Dr	8
Malton		
Zone	**Street**	**Ward**
47	Finery Crescent	5
48E	Brandon Gate Drive	5
48E	Leesburg Street	5
48E	Keenan Crescent	5
48E	Monica Drive	5
48E	Lockington Crescent	5
48E	Corliss Crescent	5
48E	Teeswater Road	5

48E	Darcel Avenue	5
48E	Meyer Drive	5
48E	Morning Star Drive	5
48E	Etude Drive	5
48W	Benavon Road	5
48W	Priory Crescent	5
48W	Roselle Crescent	5
48W	Brandon Gate Drive	5
48W	Langworthy Drive	5
48W	Mallbridge Crescent	5
48W	Catalpa Road	5
48W	Shalford Road	5
48W	Etude Drive	5
48W	Sonja Road	5
48W	Honeysukle Avenue	5
48W	Michaud Avenue	5
48W	Dooley Drive	5
49E	York Street	5
49E	Ripon Street	5
49E	Cattrick Street	5
49E	Hull Street	5
49E	Sledman Street	5
49E	Burlington Street	5
Meadowvale		
Zone	**Street**	**Ward**
45W	Falconer Drive	11
45W	Kinsmen Gate	11
45W	Drain Court	11
45W	Dunray Court	11
45W	Charing Drive	11
45W	Bowshelm Court	11
45W	Bow River Crescent	11
45W	Plainsman Road	11
45W	Alpha Mills Road	11
45W	Ellesboro Drive	11
45W	Ardsley Street	11
45E	Steen Drive	11
46W	Salerno Crescent	9
46W	Shelter Bay Road	9
46W	Pamplona Mews	9
46W	Barrisdale Drive	9
46W	Montevideo Road	9
46W	Corfu Road	9
46W	Tours Road	9
46W	Windwood Drive	9
46W	Los Palmas Cout	9

46W	Judique Road	9
46W	Inlake Court	9
46W	Oka Road	9
46W	Starfield Crescent	9
46W	Cheega Court	9
46W	Wabukayne Court	9
53	Willow Lane	11
53	Pond Street	11
53	Old Creditview Road	11
53	Spring Garden Court	11
55	Danton Promenade	10
55	Pendleton Road	10
56	Vanderbuilt Road	9
56	Saracen Court	9

City of Mississauga Ditched Roads		
Clarkson		
Zone	**Street**	**Ward**
1	Aviation Rd	1
1	Beach St	1
2	Contour Dr	2
2	Porcupine Ave	2
2	Hollywood Blvd	2
2	Owenwood Dd	2
2	Echo Dr	2
2	Parkland Ave	2
2	McConnell Ave	2
2	Tennyson Ave	2
2	Roper Ave	2
2	Longfellow Ave	2
2	Henderson Ave	2
2	Stockwell Ave	2
2	Chaucer Ave	2
2	Burns Ave	2
2	Sangster Ave	2
2	Whittier Cres	2
2	Crozier Crt	2
2	Godfrey's Lane	2
3	Meadow Wood Rd	2
3	Bob-O-Link Rd	2
3	Country Club Lane	2
3	Watersedge Rd	2
5	Orchard Hill Rd	1
5	Cherriebell Rd	1
5	Delta Rd	1
5	Cormack Cres	1
5	Rometown Dr	1
5	Marionville Dr	1
5	Skyline Dr	1
5	Glenwatson Dr	1
5	Kenneth Dr	1
5	Park Royale Blvd	1
5	Liveoak Dr	1
5	Clearwater Dr	1
5	Lincolnshire Blvd	1
5	Winterhaven Rd	1
6	Gardner Ave	1
6	Ebony Ave	1
6	West Ave	1

6	Greaves Ave	1
6	First St	1
6	East Ave	1
6	Westmount Ave	1
6	Eastmount Ave	1
6	Meredith Ave	1
6	Edgeleigh Ave	1
6	Strathy Ave	1
6	Ella Ave	1
6	Casson Ave	1
6	Orchard Rd	1
6	Pelham Ave	1
6	Sawyer Ave	1
6	Serson Ave	1
6	Balment Ave	1
6	Delco Ave	1
6	Brooks Dr	1
6	Asgard Dr	1
7	Richey Cres	1
7	Beechwood Ave	1
7	Hampton Cress	1
7	Byngmount Rd	1
7	Curzon Ave	1
7	Montbeck Ave	1
7	Lakeside Ave	1
7	Roosevelt Rd	1
7	Troy St	1
7	Marf Ave	1
7	Niar Ave	1
7	Jumna Ave	1
7	Lakebreeze Dr	1
7	Windy Oaks Rd	1
7	Crossfield Bend	1
7	Minnewaska Rd	1
7	Hollyrood Ave	1
7	Hollyrood Heights Dr	1
7	Oakes Dr	1
7	Goldthorpe Rd	1
7	Broadmoor Ave	1
7	Lochlin Trail	1
7	Willa Rd	1
7	Elaine Trail	1
7	Killaleigh Rd	1
7	Pinewood Trail	1
7	Briarhill Dr	1
7	Maplewood Rd	1
7	Crestview Ave	1

7	Radley Rd	1
7	Crediton Parkway	1
7	Carmen dr	1
7	Leda Ave	1
7	Lynd Ave	1
7	Garnet Ave	1
7	Drymen Cres	1
7	Exbury Cres	1
7	Ewald Rd	1
7	Kipper Ave	1
8	Ben Machree Dr	2
8	Indian Rd	2
8	Nocturne Crt	2
8	Temagami Rd	2
8	Arrowhead Rd	2
8	Kedleston Way	2
8	Stavebank Rd	1
8	Rosemere Rd	1
8	Mineola Rd E	1
8	Minaki Rd	1
8	Inglewood Dr	1
8	Woodland Ave	1
8	Veronica Dr	1
8	Mona Rd	1
8	Vesta Dr	1
8	Oriole Ave	1
8	Sandham Rd	1
8	Cotton Dr	1
8	Old River Rd	1
8	Wendigo Trail	1
8	Glenwood Dr	1
8	Birchwood Heights Dr	1
8	Victor Ave	1
8	Milton Ave	1
8	Kenollie Ave	1
8	Indian Valley Trail	1
8	Pinetree Cres	1
8	Pinetree Way	1
8	Douglas Dr	1
8	Oakhill Rd	1
8	Donnelly Dr	1
8	Dogwood Trail	1
8	Magenta Crt	1
8	Glenbournie Rd	1
9	Woodeden Dr	2
9	Tecumseh Park Dr	2
9	Tecumseh Park Cres	2

9	Algonquin Dr	2
9	Birchview Dr	2
9	Aldo Dr	2
9	South Aldo Dr	2
9	Albertson Cres	2
9	Bramblewood Lane	2
9	Festavon Crt	2
9	Queen Victoria Ave	2
9	Garden Rd	2
9	Glen Rd	2
9	Twin Oaks Dr	2
9	Ambleside Dr	2
9	Martley Dr	2
10	Crescent Rd	2
10	Elite Rd	2
10	Merrow Rd	2
10	Randor Dr	2
10	Camelford Rd	2
10	Bramsey Dr	2
10	Winslow Rd	2
10	South Sherdian Way	2
10	Wedmore Way	2
10	Bickford Dr	2
10	Christopher Rd	2
10	Chippendale Rd	2
10	Springwell Ave	2
10	Birchwood Dr	2
10	Whiteoaks Ave	2
10	Spring Rd	2
10	Jalna Ave	2
10	Ravine Dr	2
10	Hindhead Rd	2
10	Welwyn Dr	2
10	April Dr	2
10	Whittington Rd	2
10	Hartland Dr	2
12	Loreland Ave	1
12	Mattawa Ave	1
13	Melton Dr	1
13	Melton Crt	1
13	Bartlett Lane	1
13	Wedgewood Rd	1
13	Duchess Dr	1
13	Harcourt Cres	1
13	Whitney Dr	1
13	Annapolis Ave	1
13	Stewart Cres	1

13	Breezy Brae Dr	1
13	Redan Dr	1
13	Jonathan dr	1
13	Candish Lane	1
13	Wyton Crt	1
13	Guthrie Lane	1
13	Westfield Dr	1
13	Hedge Dr	1
13	Ribston Rd	1
13	Henley Rd	1
13	Insley Rd	1
13	Macintosh Cres	1
13	Russett Rd	1
13	Tolman Rd	1
13	Melba Rd	1
13	Greening Ave	1
13	Snow Cres	1
13	Harvest Dr	1
13	Courtland Cres	1
13	Wealthy Pl	1
13	Primate Rd	1
13	Kendall Rd	1
13	Rambo Rd	1
13	Watson Orchard Rd	1
13	Sidney Dr	1
15	Courrier Lane	7
15	Parker Dr	7
15	Isabella Ave	7
15	Gordon Dr	7
15	Harborn Trail	7
15	Harborn Rd	7
15	Grange Dr	7
16	Pineneedle Row	7
16	Oneida Cres	7
16	Mississauga Heights Dr	7
17	Jarvis St	7
17	Adamson St	7
17	Thompson St	7
17	Robinson St	7
17	Proudfoot St	7
17	Doulton Place	8
17	Doulton Dr	8
17	Blythe Rd	8
17	Springbank Rd	8
17	North Sheridan Way	8
18	Fowler Lane	2
18	Fowler Crt	2

Mavis		
Zone	**Street**	**Ward**
24	Credit Heights Dr	6
24	Killkee Gate	6
24	Rooney Gate	6
24	Enniskillen Cir	6
24	Flynn Cres	6
24	Dundas Cres	6
24	Ryan Place	6
24	Burbank Dr	8
24	Walnut Grove Rd	8
24	Featherston Dr	8
Malton		
Zone	**Street**	**Ward**
35E	Luke Rd	5
Meadowvale		
Zone	**Street**	**Ward**
55-57	Ninth Line	10
55	Tenth Line (North of Argentia)	10
52	Second Line West	11
53	Old Derry Rd	11
45	Old Creditview Rd	11

Financial Summary - Actual 2012 -2018 for VLCP

Appendix 7

Account Description	2012	2013	2014	2015	2016	2017	2018
Labour Cost	$ 383,502.00	$ 386,490.00	$ 449,646.00	$ 354,680.00	$ 390,947.00	$ 361,191.00	$ 472,665.00
Operating Expenses (Advertising, City vehicle/Equipment and contractor costs)	$ 1,167,330.00	$ 1,110,280.00	$ 1,174,847.00	$ 705,879.00	$ 835,386.00	$ 1,091,657.00	$ 1,254,532.00
Total Program Expenditures	$1,550,832.00	$1,496,770.00	$1,624,493.00	$1,060,559.00	$1,226,333.00	$1,452,848.00	$1,727,197.00
Recycling Grant Price ($ / tonne)	$122.44	$119.48	$115.22	$118.25	$171.97	$174.46	$177.42
Recorded Season Total (tonne)	$ 9,543.00	$ 7,656.00	$ 8,449.00	$ 7,384.00	$ 6,618.92	$ 4,973.23	$ 9,829.67
Revenue	$1,168,444.92	$914,738.88	$973,493.78	$873,158.00	$1,138,255.67	$867,629.71	$1,743,980.05
Net Leaf Collection Program Cost	$382,387.08	$582,031.12	$650,999.22	$187,401.00	$88,077.33	$585,218.29	-$16,783.05
Centre Line (km)	3,220.0	3,220.0	3,220.0	3,220.0	3,220.0	3,263.5	3,283.9
City s Net Cost / Tonne	$162.51	$195.50	$192.27	$143.63	$185.28	$292.13	$177.62

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 2019/06/12

To: Chair and Members of General Committee

From: Geoff Wright, P. Eng., MBA, Commissioner of Transportation and Works

Originator's files: MG.23.REP

Meeting date: 2019/06/26

Subject
Enhanced Stormwater Outreach and Education Program Update (All Wards)

Recommendations
1. That the report dated June 12, 2019 from the Commissioner of Transportation and Works titled *'Residential and Business Stormwater Outreach and Education Program Update'* be received for information; and
2. That the proposed Stormwater Outreach and Education Program as outlined in this report be approved.

Report Highlights
- Stormwater outreach and education continues to be offered by City staff via various initiatives;
- While the Region of Peel and Conservation Authorities share a stormwater theme with the City in their respective outreach and education programs, albeit from different perspectives, there are collaborative efforts and partnerships among all parties to ensure that they are delivered in a coordinated and effective manner; and
- In an effort to engage and educate a larger segment of Mississauga's population in a cost-effective way, staff is proposing a strategic shift to digital outreach, supplemented by in-person interactions, as well as a greater presence in the business sector.

Background
At the October 4, 2017 General Committee, a report from the Commissioner of Transportation and Works titled *'Enhanced Stormwater Outreach and Education Program'* provided an update on the enhanced Residential Stormwater Outreach and Education Program and the Residential Stormwater Home Visit Service pilot program which were approved by Council in 2016. The report's recommendations included increasing funding for the Residential Stormwater Home

Visit Service project as well as converting two contract positions supporting the Outreach and Education Program to permanent status.

While the importance of the City's stormwater management programs was acknowledged by members of General Committee, questions were raised over the perceived duplication of responsibilities of the City's programs with those offered by the Region of Peel and Conservation Authorities, as well as the effectiveness and efficiency of door-to-door outreach.

Consequently, General Committee did not support the report recommendations and the Commissioner of Transportation and Works committed to General Committee that staff would continue with the basic outreach and education programs and report back in a year's time.

This report provides an update on the various stormwater outreach and education initiatives that have been undertaken since October 2017 and proposes a new approach to future outreach and education programs.

Comments

Stormwater outreach and education continues to be offered by staff and is briefly highlighted below.

Stormwater Outreach and Education Initiatives

Stormwater Home Visit Service pilot program

The Residential Stormwater Home Visit Service pilot program was intended to be offered to 100 homes or for two years, whichever milestone was achieved first. The pilot program was overwhelmingly successful, exceeding all expectations by reaching its target of 100 homes in just 36 hours of registration opening in 2017. Staff was able to expand the program with existing funding to cover an additional 18 homes bringing the total number of home visits to 118. Follow up contact confirmed very high resident satisfaction with the program and over 40 additional residents who expressed interest were placed on a waitlist in case future funding became available. However, this pilot program was discontinued given that additional funding to expand the program was not approved by Council in 2017.

Stormwater Booth

In 2017 and 2018, two stormwater outreach contract staff had over 8,800 face-to-face conversations at 106 community and environmental events across the City. The earlier conversations focused on the stormwater charge and questions raised by the public about the charge. Overtime, the interactions shifted to general stormwater education. Overall, staff found that efforts to reach out to the broader public were becoming less effective where staff was coming across the same residents multiple times at various public venues.

Yellow Fish Road and Stormwater Curriculum

The Yellow Fish Road program has been offered across the City since 1993, targeted to prevent pollutants from entering storm drains and protecting our local watersheds. Starting in 2017, a customized in-class presentation program was offered at Mississauga schools as curriculum-linked stormwater courses to kindergarten to grade 12 students.

These two program offerings have led to a significant growth in participation and program reputation. During 2017 and 2018, stormwater key messages have been engagingly presented to nearly 3,000 students over 68 sessions. Compared with the 2016 figures, which offered solely the Yellow Fish Road Program, the number of participants has increased by almost 80 percent on an annual basis. The Region of Peel and Toronto and Region Conservation Authority (TRCA) proactively promote both programs on their own social media channels and direct their followers to contact City staff for any stormwater-related inquiries. As of May 16, 2019, five groups have booked the programs for the current year with an estimated 500 participants.

To supplement the school program, a series of stormwater education comic books is under development by three 2018 graduate students of the Visual Arts program at Sheridan College. Funded in part by a grant from TD Friends of the Environment Foundation, artists use both dialogue and imagery to bring stormwater key messages to life in a popular story format. Three comic books will be released in the summer of 2019.

Social Media and Digital

Stormwater has been promoted extensively on the City's Twitter, Facebook and YouTube corporate channels. Since the introduction of the stormwater charge in 2016, more than 150 posts were distributed, generating close to 365,000 impressions and nearly 6,500 points of engagement. Stormwater messages are often shared by Conservation Authorities, Region of Peel and other partner agencies.

Five stormwater-themed videos have also been produced and shared on the City's YouTube Channel. Technical and engineering terminologies have been effectively explained through a conversational and eye-catching format. These videos have gained over 2,000 views since their release last summer.

In May 2017, the stormwater team launched its own Instagram account (@saugastormwater). As of May 16, 2019, the number of followers has reached nearly 480 with approximately 150 posts. Topics such as business by-law compliance, stormwater management facilities, and stormwater arts have been trending for the past three months. Stormwater outreach staff regularly receives positive comments and proactively interacts with the public by carrying out campaigns and engagement activities.

Stormwater stories have been included in other digital vehicles such as the City's monthly eNewsletter and through articles created for Councillor newsletters.

Media Relations

Since 2017, media relations efforts by Strategic Communications have produced 57 media articles with a circulation of more than six million impressions. Mississauga Stormwater was included in articles in the Toronto Star, Globe and Mail, Mississauga News, NRU and additional local media outlets.

ArtWorkX

In May of 2017, a new event, ArtWorkX, was introduced to the public to showcase common, but often overlooked municipal infrastructure by combining it with modern art. Staff partnered with the City's National Public Works Week (NPWW) Family Fun Day event with annual attendance of 1,000 visitors. Local artists transformed non-functioning pieces of City infrastructure into art during a day-long live art performance; multiple local and internal partners, including Credit Valley Conservation Authority (CVC), TRCA, Region of Peel, Fern Ridge Landscaping and the Environment Division, participated and creatively incorporated stormwater messages into their children's activities, exhibits and demonstration.

In 2018, ArtWorkX returned with two separate events. A collaborative demonstration and children's activity centre was created for the City's 2018 NPWW Family Fun Day event to a crowd of around 1,000 visitors. The infrastructure transformation and live art performance component were shifted to the After Hours Earth Market on the evening of July 14 with an estimated attendance of 5,000 people during the 12-hour event. The performance art pieces created at the event were displayed in the lobby gallery of the Living Arts Centre (LAC) for two weeks following the show to maximize the exposure of the pieces and the stormwater messaging. The LAC has expressed interest in supporting ArtWorkX at any future events.

Non-Residential and Multi-Residential Outreach

In 2018, the stormwater outreach staff worked with the Enforcement Division to implement a business outreach pilot project. In a local business community with a history of illegal discharge into the storm sewer system, staff delivered messages related to Storm Sewer Use By-Law compliance and pollution prevention practices to more than 200 local business operators through a door-to-door outreach campaign. This personalized approach has been well-received with many business operators subsequently contacting staff to express interest in further education on stormwater best management practices.

In May of 2018, the City provided funding to CVC's Greening Corporate Grounds (GCG) Program to help the Industrial, Commercial and Institutional (ICI) sectors understand the technologies and visualize the options of lot-level stormwater management by providing customized site assessment and site plans. This 3-year GCG pilot program is currently only available within CVC's jurisdiction and targets medium to large businesses.

Stormwater-related Programs Among Local Partners

At the October 4, 2017 General Committee, members raised questions related to the overlapping of stormwater outreach and education with the Region of Peel and Conservation Authorities.

The Region and Conservation Authorities do share a stormwater theme with the City in their outreach and education programs. This is attributed to the fact that their respective mandates have a connection to stormwater, albeit from different perspectives.

The City of Mississauga delivers city-wide stormwater education related to the importance of stormwater management programs, the value of stormwater infrastructure, municipal efforts on flood relief and water quality enhancement, as well as how the implementation of stormwater best management practices on private property brings benefits to both the property owners and City's stormwater drainage system. The Region of Peel's mandate includes the delivery of drinking water and managing wastewater within the region. While the Region's public education and outreach programs touch on the management of stormwater, the main focus is on steps that homeowners can take on their properties to reduce the inflow and infiltration of stormwater into the sanitary sewer system. Meanwhile, the Conservation Authorities' outreach and education is far-reaching and focuses on local environmental issues and the conservation, restoration and responsible management of water, land and natural habitats.

While stormwater outreach and education is being delivered by our partners given their connection to stormwater, the planning and delivery of educational messages to the public is done in a collaborative manner with all of our partners. For example, as mentioned earlier, in order to encourage uptake in the Stormwater Credit Program, the City provided three-year funding to CVC starting in 2018 as part of its Greening Corporate Grounds (GCG) program to promote and support the implementation of low impact development stormwater management practices on commercial, industrial, institutional and multi-residential properties. The City also partnered with TRCA on its Burnhamthorpe Sustainable Neighbourhood Action Program (SNAP) and Partners in Project Green.

Proposed Plan for Stormwater Outreach and Education

The importance of stormwater outreach and education remains a topic of discussion especially with the commercial sector. As recently as the Stormwater Service Area 2019 budget and 2019-2022 Business Plan presentation on January 15, 2019 at Budget Committee, a Mississauga Board of Trade deputation and comments made by members of Budget Committee noted that greater communication with commercial sectors is needed in order to build awareness and promote adoption of stormwater best management practices at the lot level and uptake of the stormwater credit program.

As mentioned earlier, the face-to-face communication with residential property owners at the onset of the stormwater charge was effective. However, given that the focus has now shifted from information related to the charge to general stormwater education, staff has found that efforts to reach out to the broader public were becoming less effective and new opportunities needed to be explored.

In an effort to engage and educate a larger segment of the Mississauga population in a cost-effective and measurable way, the stormwater team, with support from Strategic Communications, is proposing a strategic shift to digital outreach, supplemented by in-person interactions, as well as a greater presence with the commercial sector.

To fulfill the mandate of stormwater message delivery across the City, a proposed plan of actions with the projected allocation of efforts is provided in the Table 1 below.

Table 1

Strategic Direction	Target Audience	Actions	% of Digital / In-person outreach
Establish a strong stormwater online presence	General Public	Provide the community with current and accurate stormwater information that is aligned with the City's Digital Strategy and Smart City Master Plan: • Work collaboratively with City's Digital Strategy team to ensure the accessibility and accuracy of stormwater online content; • Develop an interactive map of stormwater capital projects and update the content on a regular basis; • Continue to develop engaging and tutorial videos with a detailed promotion plan; • Continue to expand Project Profiles to demonstrate how the stormwater charge funding has been allocated; and • Organize site tours to explain the rationale and the functionality of the designated stormwater infrastructure *(in-person outreach required).*	90% / 10%

Table 1 (continued)

Strategic Direction	Target Audience	Actions	% of Digital / In-person outreach
Establish a strong stormwater online presence	General Public	Develop digital content for social media channels to provide the community with an accessible, current and interactive channel to engage with the stormwater team: • Work collaboratively with Strategic Communications to develop an engaging content strategy for stormwater social media channels and corporate channels; • Develop strong visualized and easy-to-understand graphic content, including, infographics and digital brochures, that can be published on social media and web platforms and shared with media partners; and • Explore and implement organic and paid social tactics to reach the target audience with different interests in stormwater topics.	90% / 10%
Reduce barriers to apply for Stormwater Credit Program	ICI Sectors	Continue to partner with CVC's Greening Corporate Grounds (GCG) program to effectively deliver stormwater messages and services to *medium* to *large* size businesses within the ICI sector and within CVC's jurisdiction.	50% / 50%
		Explore a partnership opportunity to expand the GCG services to TRCA's jurisdiction.	
		Convey stormwater messages regarding by-law enforcement and pollution prevention practices to *small* businesses which make up the majority of Mississauga's business community. In-person communication is proven to be the most effective way to prevent small businesses from illegal discharging and contaminating local watersheds *(in-person outreach required)*.	
Improve stormwater literacy in schools	Youth and Children	Release and promote three comic books in both paper and digital formats to allow youth to learn and remember stormwater key messages via a visual and storytelling representation.	75% / 25%

Table 1 (continued)

Strategic Direction	Target Audience	Actions	% of Digital / In-person outreach
Improve stormwater literacy in schools	Youth and Children	Develop online curriculum-linked resources to allow educators to access the course materials 24/7 and incorporate stormwater messages into their course design.	75% / 25%
		Continue to deliver the Yellow Fish Road program and in-class presentations to schools and community groups throughout the City *(in-person outreach required).*	

Given the shift in focus from in-person to digital outreach, it is recommended that the existing two contract full-time positions be eliminated in the 2020 Stormwater Business Plan and Budget. In their place, a two-term co-op student position (January to August) will deliver ongoing educational services to the general public, especially for the delivery of the Yellow Fish Road program and in-class presentations.

Strategic Plan

The Enhanced Stormwater Outreach and Education Program falls under the Living Green Strategic Pillar and all of its strategic goals to Lead and Encourage Environmentally Responsible Approaches, Conserve, Enhance and Connect Natural Environments and Promote a Green Culture.

Financial Impact

The financial impact of the proposed strategy going forward for stormwater outreach and education program is a net decrease in the 2020 operating budget of $73,050 and decrease in FTEs by 1.3 and no 2019 financial impacts.

Highlights of changes to the 2020 operating budget in cost centre 23733 (Storm Services) are as follows:

- Decrease contract labour cost of $122,290 with the removal of the two contract full-time positions (2.0 FTE) currently supporting the operations and administration of the Outreach and Education Program;
- Increase part-time labour cost of $29,240 for a two-term co-op student for 8 months each year (0.7 FTE) to deliver ongoing educational services to the general public, including delivery of the Yellow Fish Road program and in-class presentations;
- Increase promotional materials cost of $20,000 for education material development with the strategic shift to digital outreach.

- Increased costs in professional services related to the development of digital media will be absorbed in the existing professional services budget of $190,000.

The following table summarizes the financial impact of the changes being proposed to be included in the 2020 Stormwater Business Plan and Budget.

Expense Category	2020 Budget Impact Increase / (Decrease)	2020 FTE Impact Increase / (Decrease)
Contractor Salary & Benefits	(122,290.00)	(2.0)
Part-Time Salary & Benefits	29,240.00	0.70
Labour and Benefits	**(93,050.00)**	**(1.30)**
Promotional Materials	20,000.00	
Total Net Expenditure	**(73,050.00)**	**(1.30)**

Conclusion

The Stormwater Outreach and Education Program was established in 2015 in advance of the launch of the stormwater charge and served a key purpose of informing the residents and businesses of Mississauga of the upcoming charge. The Program has since evolved to general stormwater outreach and staff continues to deliver various stormwater outreach and education initiatives across the City. The need for effective outreach and education regarding stormwater remains important. However, the approach for the City is for a strategic shift to digital outreach, supplemented by in-person interactions, as well as a greater presence with the commercial sectors. This is an evolution of the current stormwater outreach and education program and a critical step to reach out and educate a broader public in an effective manner.

Geoff Wright, P. Eng., MBA, Commissioner of Transportation and Works

Prepared by: Shaunna Xiao Zhang, MSc., Stormwater Charge Program Coordinator (A)

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 6/12/2019	Originator's files:
To: Chair and Members of General Committee	
From: Geoff Wright, P.Eng., MBA, Commissioner of Transportation and Works	Meeting date: 6/26/2019

Subject
SustainMobility Agreement and Funding

Recommendations
1. That the Corporate Report entitled "SustainMobility Agreement and Funding" dated June 11, 2019, from the Commissioner of Transportation and Works be received; and

2. That the Agreement with SustainMobility entered into on April 1, 2018 be terminated in accordance with the provisions contained therein due to a discontinuation of funding from the City's funding partners.

Background
The City of Mississauga (the "City") entered into a 3-year funding agreement (April 2018 to April 2021) with SustainMobility on April 1, 2018 to provide a framework for the implementation and delivery of Transportation Demand Management (TDM) services with a mandate to promote and support sustainable transportation solutions and to improve mobility and accessibility in the City.

Smart Commute is an initiative of Metrolinx and the municipalities in the Greater Toronto and Hamilton Area. Smart Commute Mississauga is one of the programs offered by SustainMobility.

As part of the current funding agreement, SustainMobilty provides a number of services to the City, including:

- Carpool Matching Tool;
- Emergency Ride Home Program;
- Outside Employer TDM Programming with 57 employers to deliver TDM programming (e.g. on-line portal, posters and engagement);
- Reserved carpool parking administration program, providing parking signage/hang-tags for 15 workplaces to promote reserved carpool parking for their employees; and

- Up to three (3) annual campaigns per year (e.g. Carpool Month, Walktober, Bike Month and/or Transit Month)

Comments

The Smart Commute Mississauga program is delivered by SustainMobility and has been primarily funded by Metrolinx ($275,000 per year), with support from the Region of Peel ($145,000 per year) and the City ($60,000 per year).

In a letter dated March 29, 2019, Metrolinx notified the Region of Peel that Metrolinx had undertaken a thorough fiscal review of their programs and services, and as a result, would be terminating their Service Delivery Agreement with the Region of Peel for the delivery of the Smart Commute programs effective June 29, 2019 (refer to Appendix 1). Subsequently, on April 15, 2019, the Region of Peel notified SustainMobility that they would be terminating their funding agreements with SustainMobility (refer to Appendices 2 and 3).

As per Section 2 of the City's agreement with SustainMobility, the City may terminate the agreement at any time should Metrolinx or the Region of Peel choose to terminate their respective funding agreements.

Without its primary funding partners, Metrolinx and the Region of Peel, the Smart Commute Mississauga Program will not be able sustain itself in its existing capacity. Therefore, there is a strong rationale for the City to terminate its funding agreement with SustainMobility for the delivery of the Smart Commute Mississauga program and to review alternate options to deliver similar programming with its available budget.

Financial Impact

There are no 2019 financial impacts resulting from the recommendation in this report. The funding contribution to SustainMobility for 2019 will be a pro-rated to the termination date and based on the payment milestones as set out in the agreement. Staff will utilize the remaining budget in 2019 to deliver TDM initiatives.

The $60,000 operating budget for the SustainMobility Program will be adjusted in the 2020 budget based on the alternative options to deliver similar programming.

Conclusion

Given Metrolinx's and the Region of Peel's termination of funding for the Smart Commute program and the resulting significant reduction in programming and services, staff recommends that the City terminate the funding agreement with SustainMobility for delivery of the Smart Commute Mississauga programs in accordance with the provisions contained in the agreement.

To continue to meet the City's transportation objectives with respect to TDM, staff will explore options for future programming, including options with the Region of Peel and other municipalities (Caledon and Brampton).

Attachments

Appendix 1: Metrolinx Funding Termination Letter
Appendix 2: Region of Peel - Termination of Funding agreement with Smart Commute Mississauga
Appendix 3: Region of Peel - Termination of Funding agreement with Smart Commute Pearson Airport Area

Geoff Wright, P.Eng., MBA, Commissioner of Transportation and Works

Prepared by: Jacqueline Hunter, TDM Coordinator

METROLINX

APR 04 2019

Region of Peel
c/o Gary Kocialek
10 Peel Centre Drive, Suite B
Brampton, ON
L6T 4B9

March 29, 2019

Dear Mr. Kocialek,

As you may be aware, Metrolinx has recently undertaken a thorough fiscal review of our programs and services.

This letter is to inform you that as a result of this review, Metrolinx is hereby terminating the Service Delivery Agreement for the delivery of the Smart Commute program, in accordance with our rights under Article 13.1

> Metrolinx may, in its sole discretion, without liability, cost or penalty, and without prejudice to any other rights or remedies of Metrolinx under this Agreement or at law or in equity, terminate this Agreement at any time, for any reason, upon giving at least ninety (90) days' notice to the Service Provider.

The 90-day notice period commences on April 1, 2019 and therefore the Service Delivery Agreement will be terminated on, June 29, 2019.

We have provided you with an updated "Schedule D - Payment Details", which outlines the funds payable by Metrolinx with respect to the 2019-20 fiscal year for the aforementioned 90-day period.

We would like to thank you for your partnership on this program, and also note that while Metrolinx's support of the program is ending, we will work with you to understand which program elements and assets would benefit the on-going delivery of the program, should you choose to do so.

If you have any questions related to this notification please contact Doug Spooner.

Sincerely,

Dean Kotwal
Senior Legal Counsel, Metrolinx

97 Front Street West
Toronto, ON M5J 1E6
416.874.5900
metrolinx.com

Region of Peel
working with you

Public Works

10 Peel Centre Dr.
Suite B
Brampton, ON
L6T 4B9
tel: 905-791-7800

peelregion.ca

April 15, 2019

Glenn Gumulka
Smart Commute Mississauga
c/o SustainMobility
202-4080 Confederation Parkway
Mississauga, ON L5B 0G1

Dear Mr. Gumulka:

Regarding: Termination of Funding Agreement related to the Smart Commute Program

This letter is to inform you that after their review of the Smart Commute program Metrolinx has decided to terminate their Service Delivery Agreement with The Regional Municipality of Peel (the "Region of Peel") for the delivery of the Smart Commute program effective June 29, 2019. As a result of this termination, the Region of Peel is hereby terminating the Funding Agreement Related to the Smart Commute Program with SustainMobility (the "Agreement"), in accordance with the Region of Peel's rights under Article 12.1

> *The Region of Peel may, in its sole discretion, without liability, cost or penalty, and without prejudice to any other rights or remedies of the Region of Peel under this agreement or at law or in equity, terminate this Agreement at any time, for any reason, upon giving at least ninety (90) days' notice to the Service Delivery Agent.*

The 90-day notice period commences on April 15, 2019 and therefore the Agreement will be terminated on, July 15, 2019.

An updated Schedule "D" -Payment Details, and an updated table of quarterly payments of Region of Peel Funds from Schedule "G" of the Agreement have been provided, which outline funding from April 15 – July 15, 2019, payable by the Region of Peel for the aforementioned 90-day period. SustainMobility will be responsible for providing the Region of Peel with all invoices by July 15, 2019 and for continuing to provide services under the Agreement until such date.

The Region of Peel has a shared vision to move Peel Region towards sustainability as an approach, to accommodate the mobility needs of our growing communities and create a community that is more environmentally friendly, healthier, and considers the long-term benefits for current and future generations.

We are exploring options for future programming and funding opportunities with Regional Leads, who are working with Metrolinx to secure more details, as well as

Region of Peel
working with you

working closely with our local municipalities (Caledon, Brampton and Mississauga) and stakeholders.

We would like to thank you for your services and work on this program and note that while the Region of Peel's support of this program is ending, the Region of Peel will continue to work with you throughout this transition.

Public Works

10 Peel Centre Dr.
Suite B
Brampton, ON
L6T 4B9
tel: 905-791-7800

peelregion.ca

Your truly,

Gary Kocialek
Director, Transportation

Attachment: Schedule "D" Payment Details for April 15, 2019 to July 15, 2019
Schedule "G" Table of Quarterly Payment of Region of Peel Funds for April 15, 2019 to July 15, 2019

Cc: Kathryn Lockyer, Regional Clerk & Director of Legal Services, Jacqueline Hunter, TDM Coordinator, City of Mississauga

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SCHEDULE "D"
PAYMENT DETAILS
for April 15 – July 15, 2019

Service Delivery Agent's Upset Limit (90 day) – (includes both Metrolinx Funds and Region of Peel Funds): **$51,615.47**

1. Metrolinx Funds:

   (a) Payment for Member Level Services: **$42,049.97**

   (b) Custom Project Cap: **$0**

   (c) Behavioural Change Payment: **$0**

2. Region of Peel Funds: **$9,562.50**

   (a) Maximum amount to be used towards Member Level Services: **$9,562.50**

   (b) Maximum amount to be used towards Custom Projects: **$0**

SCHEDULE "G"
PAYMENT OF REGION OF PEEL FUNDS
Table of Quarterly Payment for April 15, 2019 to July 15, 2019

	Quarter 1 – April 15 to July 15, 2019
Custom Projects	$0
Member Level Services	$9,562.50
Total	$9,562.50

Region of Peel
working with you

Public Works

10 Peel Centre Dr.
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Brampton, ON
L6T 4B9
tel: 905-791-7800

peelregion.ca

April 15, 2019

Glenn Gumulka
Smart Commute Pearson Airport Area
c/o SustainMobility
202-4080 Confederation Parkway
Mississauga, ON L5B 0G1

Dear Mr. Gumulka:

Regarding: Termination of Funding Agreement related to the Smart Commute Program

This letter is to inform you that after their review of the Smart Commute program Metrolinx has decided to terminate their Service Delivery Agreement with The Regional Municipality of Peel (the "Region of Peel") for the delivery of the Smart Commute program effective June 29, 2019. As a result of this termination, the Region of Peel is hereby terminating the Funding Agreement Related to the Smart Commute Program with SustainMobility (the "Agreement"), in accordance with the Region of Peel's rights under Article 12.1

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Gary Kocialek
Director, Transportation

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Cc: Kathryn Lockyer, Regional Clerk & Director of Legal Services, Jacqueline Hunter, TDM Coordinator, City of Mississauga

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SCHEDULE "D"
PAYMENT DETAILS
for April 15 – July 15, 2019

Service Delivery Agent's Upset Limit (90 day) – (includes both Metrolinx Funds and Region of Peel Funds): **$29,135.69**

1. Metrolinx Funds:

   (a) Payment for Member Level Services: **$22,385.69**

   (b) Custom Project Cap: **$0**

   (c) Behavioural Change Payment: **$0**

2. Region of Peel Funds: **$6,750.00**

   (a) Maximum amount to be used towards Member Level Services: **$6,750.00**

   (b) Maximum amount to be used towards Custom Projects: **$0**

SCHEDULE "G"
PAYMENT OF REGION OF PEEL FUNDS
Table of Quarterly Payment for April 15, 2019 to July 15, 2019

	Quarter 1 – April 15 to July 15, 2019
Custom Projects	$0
Member Level Services	$6,750.00
Total	$6,750.00

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 2019/06/07

To: Chair and Members of General Committee

From: Geoff Wright, P. Eng., MBA, Commissioner of Transportation and Works

Originator's files:

Meeting date: 2019/06/26

Subject

Mississauga Transitway Project - Execution of Maintenance Agreements with the Regional Municipality of Peel for Station Water and Sanitary Infrastructure and Dixie Road Underpass Structure (Wards 3, 4 and 5)

Recommendation

That the Commissioner of Transportation and Works be authorized to execute Maintenance Services Agreements between the City of Mississauga and the Regional Municipality of Peel for the City to provide maintenance and repair services to: (i) the water and sanitary infrastructure feeding certain stations along the Mississauga Transitway; and (ii) certain portions of the underpass structure under Dixie Road that forms part of the Mississauga Transitway, in a form satisfactory to the City Solicitor.

Background

The City of Mississauga has completed construction of the Mississauga Transitway, a dedicated east-west bus transit corridor across Mississauga that runs along portions of Highway 403, Eastgate Parkway and Eglinton Avenue.

The Regional Municipality of Peel (Peel) is responsible for providing water and sewer services throughout Peel, including the maintenance and repair of water and sewer services installed within public right of ways. With that being said, for certain stations along the Transitway route located in Mississauga they are not located in the public right of way (Station Services).

During the construction of the Station Services, Peel and the City agreed that Mississauga would maintain and repair all Station Services infrastructure upon project completion.

A portion of the Transitway intersects and passes under Dixie Road. Construction of the Transitway at this location required the completion of an underpass structure that now forms part of Dixie Road and serves as a Transitway underpass. As a result, the maintenance and repair obligations of the underpass must be appropriately apportioned as between Peel and the City.

Comments

There are two Maintenance Service Agreements between the City and Peel requiring execution by the City's Commissioner of Transportation and Works.

Maintenance Agreement for Water and Sanitary Infrastructure at Stations

Peel is responsible for providing water and sanitary services throughout Peel, including the maintenance and repair of services installed within road right of ways. These services include water and sewer mains, water and sewer connector mains, valve chambers, detector check valve chambers, pipes, sanitary sewer sampling maintenance holes, and all other related infrastructure.

Maintenance and repair of these water, or sanitary and water services are required for certain stations along the Transitway that include:

- Central Parkway
- Tomken
- Dixie
- Tahoe
- Etobicoke Creek
- Spectrum
- Orbitor.

Portions of the services feeding the Transitway stations, although owned by the City, fall outside of the portion of lands dedicated as a highway (or road right of way), and the responsibility to maintain and repair is the City of Mississauga's responsibility and not Peel's.

Reference plans will be required for the Transitway stations defining demarcation lines and shall be prepared by the City to support the agreement.

Joint Maintenance Agreement for the Underpass Structure under Dixie Road

The Transitway passes under Dixie Road, a public highway under the jurisdiction of Peel, via an underpass structure constructed by the City as part of the Transitway project.

Peel and City desire to enter into an agreement to define responsibilities for the maintenance, repair and replacement of the underpass structure and related portions of the Transitway and Dixie Road.

It is the intention of Peel and the City that the City will be responsible for the maintenance, repair, and replacement of the Transitway, including the underpass structure, and the maintenance and repair of the Dixie Road sidewalks and streetlighting on Peel's behalf, for which the City shall recover costs.

Peel is to be responsible for the maintenance, repair, and replacement of the paved surface of Dixie Road, including all related appurtenances.

Financial Impact

There are no financial impacts other than the nominal cost of preparation of reference plans, which will be accommodated through the Transitway capital project (08-232). All future associated costs and recoveries from the Regional Municipality of Peel with respect to station sanitary infrastructures and the Dixie Road underpass structure, will be included in future operating and capital replacement budgets.

Conclusion

This report is seeking approval for the Transportation and Works Commissioner to be authorized to execute appropriate Maintenance Services Agreements between the City of Mississauga and the Regional Municipality of Peel, in a form satisfactory to the City Solicitor, for the City to provide maintenance and repair services to the water and sanitary infrastructure feeding certain stations along the Mississauga Transitway, and certain portions of the underpass structure below Dixie Road that forms part of the Mississauga Transitway.

Geoff Wright, P. Eng., MBA, Commissioner of Transportation and Works

Prepared by: W. Scott Anderson, P.Eng., Manager of Streetlighting and Projects

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 2019/06/14

To: Chair and Members of General Committee

From: Robert Trewartha, Chief of Staff, Mayor's Office

Originator's files:

Meeting date: 2019/06/26

Subject
Mississauga Matters: Summary of Priority Issues and Engagement Strategy for the 2019 Federal Election

Recommendation
1. That the report "Mississauga Matters: Summary of Priority Issues and Engagement Strategy for the 2019 Federal Election" be endorsed as the City of Mississauga's priority issues pertaining to the October 21, 2019 Canadian federal election.
2. That the engagement tactics recommended in the report entitled ""Mississauga Matters: Summary of Priority Issues and Engagement Strategy for the 2019 federal election" be approved for implementation.

Report Highlights
The Canadian general election is scheduled to be held on October 21, 2019

The federal government is an important partner in ensuring the City of Mississauga meets its objectives, realizes its vision, and achieves its city-building priorities, specifically through proper funding mechanisms.

A federal election affords the City of Mississauga the opportunity to engage with political leaders and candidates on key issues of importance. While there are many issues of importance between the City of Mississauga and the federal government, it is recommended that the City focus on just four in our engagement strategy: public transit, sustainable and direct funding for infrastructure, affordable housing, and strengthening the relationship between the federal and our municipal government.

The proposed name of the City of Mississauga provincial election strategy is "Mississauga Matters."

A number of engagement tactics are outlined that range from simple fact sheets for the general public, online engagement, and candidate and stakeholder information sessions.

Background

The next federal election will take place on October 21, 2019. The official writ period will likely begin a month prior, although this date has not yet been determined.

The City of Mississauga is an important stakeholder to the federal government and our residents will be directly affected by the outcome of the federal election. It is important that the City of Mississauga not only makes its top priorities known to the local candidates and party leaders, but also engages residents, businesses and key stakeholders to demonstrate the importance of Mississauga's priorities and why Mississauga matters to them. Our City is home to 6 federal ridings, currently held by members of the governing party.

Over the past many provincial and federal election cycles, the City of Mississauga has developed and deployed advocacy and engagement strategies. These previous engagement strategies have informed residents, businesses, and stakeholders about important municipal priorities and engaged them as supporters of the City's message. They have also informed local candidates running in the 6 local ridings about the City's priorities and what our expectations are for the party that forms the next provincial government.

The purpose of this report is to summarize the priority issues for the City and outline an engagement strategy for stakeholders, candidates, and federal parties during the 2019 federal election.

Mississauga Matters 2018 Provincial Campaign

In 2018, the City of Mississauga undertook a provincial advocacy campaign to showcase our priorities to the provincial parties and local candidates. The campaign featured a number of tactics, including significant presence on social media, information and advocacy materials (printed and digital), videos and visual materials, as well as a debate in the Council Chamber featuring 4 local candidates.

The results of the social media campaign, using the #MississaugaMatters hashtag were as follows (Appendix A):

- 355,587 impressions (target: 100,000)
- 13,071 engagements (target: 1,500)
- 29, 248 media views (target: 5,000)

An impression means the number of people reached; engagement means likes, comments, post shares; and media views means videos and visual materials were viewed.

The 2018 provincial campaign was provided a budget of $50,000. Multiple departments within the corporation provided input and information and helped execute the strategy. Preparation work on the campaign began in January 2018 and the campaign was fully implemented between May 9, 2018 and June 13, 2019.

Comments

APPROACH

The strategy will aim to keep the number of issues manageable focusing on key priorities as identified by Council. If the strategy has too many messages or too many priorities, it will be difficult to engage our target audiences and deliver our message effectively.

Using the 2019 federal pre-budget submission as a guide, the overall message to provincial parties and candidates will be:

> *"Mississauga needs a committed federal government partner to provide consistent, predictable, direct and long-term funding and the legislative authority to allow us to build Mississauga into a world-class city."*

This message will underpin the entire strategy and shape the messaging of each of the priority areas: public transit; sustainable funding for infrastructure, affordable housing; and a strengthening of the municipal-federal relationship, with a greater emphasis on direct funding transfers to Mississauga.

While the federal government is limited in its direct interaction with municipal governments, in recent years there has been a shift towards a strengthened relationship. This has resulted in increased funding (i.e. doubling of the Federal Gas Tax in 2019), as well as unprecedented investments in housing, infrastructure, transit, and green infrastructure. Mississauga has and will continue to benefit from this new relationship with the federal government and the associated funding. It is our intention that the federal government continues this approach to municipalities following the 2019 federal election.

It is proposed that the strategy be titled "Mississauga Matters" to demonstrate not only the importance of our City to the next federal government, but also to local residents, businesses and stakeholder groups. The title has an additional meaning as through the engagement strategy we will also discuss priority matters pertaining to the City of Mississauga. This title has been used for previous federal and provincial election campaigns, most recently in the 2018 provincial election, and has been found quite effective.

During the 2015 federal election, the Federation of Canadian Municipalities (FCM) conducted a campaign called "Hometown Proud," where they sought to make local priorities into national priorities. It was highly effective with many of the campaign planks adopted into the platforms of the main parties. In 2019, FCM is again undertaking an advocacy campaign to encourage each party to maintain and enhance the federal government's relationship with municipalities. They are again seeking to make local issues into national issues.

Recent public opinion research by FCM supports this approach. Here are some highlights from the May 2019 research conducted by Abacus Data on behalf of FCM (Appendix B):

- **61 per cent** of Canadians believe municipal governments are best understanding challenges facing our communities (13 percent provincial; 5 per cent federal)
- **46 per cent** believe municipalities are best able to plan for what infrastructure upgrades and maintenance is needed in our communities (24 per cent provincial; 9 per cent federal)
- **82 per cent** of Canadian say federal and municipal governments do not talk enough
- **48 per cent** of Canadians do not believe municipalities have enough resources to manage, maintain and build infrastructure
- **86 per cent** of Canadians believe it is a "good" or "very good" idea to give municipalities more control to manage infrastructure projects and 83 per cent want to give greater control to municipalities to decide where money is spent
- **84 per cent** of Canadians believe it is a "good" or "very good" idea for a federal party to promise to give municipalities permanent, dedicated funding and allow them to decide what the money is spent on
- **85 per cent** of Conservative Party supporters, 86 per cent of Liberal Party supporters, and 83 per cent of NDP supporters are in support of permanent funding tools for municipalities.

The research shows there is public support for a stronger federal-municipal relationship and a willingness to support parties that provide more direct funding to municipalities to improve local communities. The 2019 federal Mississauga Matters campaign will advocate to maintain the funding we have already received and make the case for increases in the years to come.

PRIORITY ISSUES

The four proposed priority areas of focus for our engagement strategy include:

- **Investments in Public Transit and Transportation Infrastructure**
- **Affordable Housing**
- **Consistent, predictable, and long-term funding for infrastructure**
- **Strengthening the relationship between the federal and our municipal government**

i. **Public Transit and Transportation Infrastructure**

The City of Mississauga has a strategic vision that is only achievable if reliable, sustainable public transit systems are built. The City continues to make significant investments in public transit locally, but we require additional investment from the federal (and provincial) government to realize our long-term transit objectives. It is critically important to Mississauga that the next federal government is committed to continuing to work with the City to build transit, as well as to long-term, sustainable, and predictable funding.

In 2016, the federal government committed to Phase One of the Invest in Canada Infrastructure Plan (ICIP), which provided the City of Mississauga with $58 million (50/50 cost share). This allowed us to make significant investments in our transit and mobility infrastructure across the city, most notably purchasing 77 new diesel-hybrid transit buses. Phase 2 of ICIP has allocated $843 million to the City of Mississauga over 11 years (40% federal; 33% provincial; and 27% municipal). It is important that these investments continue with the next federal government as they provide much-needed funding for our city to address outstanding projects on our capital infrastructure list.

The federal government has a role to play in investing Mississauga's priority transit projects, which include:

- The Downtown Mississauga Terminal and Transitway Connection;
- The Dundas Bus Rapid Transit Corridor;
- Higher order transit on the Lakeshore Corridor as per the Lakeshore Connecting Communities strategy;
- All-day, two-way GO on the Milton Line through infrastructure improvements, including the "Missing Link,"; and
- Regional Express Rail service on the Lakeshore West and Kitchener GO Corridors

The questions that political parties and candidates should answer are:

- Will you and your party commit to maintain and enhance the investments in transit in Mississauga?
- Will you provide direct funding on an allocation basis to Mississauga to build local and rapid transit in our City?

Message to residents, businesses and stakeholders:

- To reduce congestion and traffic, and to continue to grow our local economy, Mississauga needs predictable, long-term, and sustainable federal funding to build local and regional rapid transit.

ii. **Sustainable Infrastructure**

The quality of life of Mississauga residents depends on basic infrastructure like roads, bridges and water and waste water systems, but also on parks, trails, community centres and other amenities being in a state of good repair. In 2019, Mississauga has an estimated $9.2 billion in infrastructure assets.

Mississauga's infrastructure is funded through a combination of property taxes, debt financing, gas tax, development charges, as well as reserve funds the City has set aside. The City of Mississauga needs more than $356 million every year to put funds away for replacement of future infrastructure needs. In 2019, the City will only raise $35 million through property taxes and $63 million through gas tax for existing infrastructure, leaving a funding shortfall of $258 million. Still it is not enough. The City needs to continue to apply the two percent infrastructure and debt repayment levy in order to manage our infrastructure and keep our foundations strong.

To maintain Mississauga's infrastructure in a state of good repair, long-term, predictable and sustainable infrastructure funding is required. Municipalities own 60% of all infrastructure in Canada, yet only receive 9 cents of every tax dollar collected, compared to 44 cents for the province and 47 cents for the federal government. Municipalities like Mississauga need the federal (and provincial) government to provide more long-term, predictable funding for infrastructure.

In the 2019 federal budget, the government announced a one-time doubling of the Federal Gas Tax. In Mississauga, this resulted in $20 million more to the city of Mississauga to invest in our transit and infrastructure priorities. While this one-time funding was appreciated and will be put to good use, it is our objective, and that of the entire municipal sector, that this direct funding from the federal government to municipalities be enhanced and made permanent. The traditional funding delivery model requires bilateral agreements with the provinces, which is cumbersome and does not allow municipalities as much say with respect to the projects that will be funded. A direct, allocation-based funding model from the federal government is the most efficient way for cities like Mississauga to build infrastructure in a timely fashion.

The City has already developed materials to show residents what our infrastructure consists of, including a brochure that has already been used in our provincial and federal advocacy efforts. We will use this work as a base to showcase to federal parties and candidates, as well as residents the need for federal funding. The approach will be to demonstrate the types of infrastructure that residents enjoy (trails, community centres, roads and bridges, etc.) is at risk if we do not secure sustainable funding from the federal government.

The questions political parties and local candidates must answer are:

- Do you and your party commit to developing long-term, predictable, and sustainable funding programs from the federal government to specifically fund the building and maintenance of municipal infrastructure?
- Will you commit to providing permanent, direct funding to municipalities, similar to the one-time doubling of the Federal Gas Tax.

Message to residents, business and stakeholders:

- Mississauga owns $9.2 billion infrastructure ranging from roads and bridges, to trails, parks, community centres, and much more that impacts the lives of residents every day. We need a committed provincial partner to provide sustainable, long-term and predictable infrastructure funding to build Mississauga into a world-class city.

iii. Affordable, Housing

In 2017, Mississauga took the lead by developing a made-in-Mississauga plan to address issues of housing affordability in our City. The goal of "Making Room for the Middle" is to make 35% of Mississauga's housing stock affordable ($250,000 - $400,000 ownership/$1,200 per month rental) for middle income earners ($55,000 - $100,000 household income). Housing is considered "affordable" when a household pays less than 30% of their income on housing. In Mississauga, more than 33% of households are spending more than 30% of their income on housing, demonstrating a significant housing affordability issue exists in Mississauga.

Within the 40 recommendations in our housing strategy, 7 specifically require federal support or legislative changes to provide the City with more authority and ability to achieve our objective of incentivizing the building of affordable, middle-class housing. These include:

1. Petition senior levels of government (Peel, Provincial and Federal Governments) to create enduring and sustainable funding programs that realize developer timeframes and financial needs
2. Appeal to senior levels of government (Peel, Province and Federal Governments) to provide affordable home ownership assistance to individuals
3. Petition senior levels of government to consider taxation policies that incent affordable housing that include but are not limited to:
    a. the creation of second units
    b. rehab of existing purpose built rental housing
    c. new purpose built rental housing
    d. GST rebates or exemptions
4. Appeal to Federal and Provincial governments to explore tax credits and exemptions for affordable housing including but not limited to:
    a. income tax credit (e.g. second unit homeowners)

b. land transfer tax exemptions
c. create land value capture tools for municipalities
d. low income housing tax credits

5. Encourage senior levels of government to provide financial backing/insurance to affordable housing developers
6. Petition senior levels of government to provide standardized local housing data and consistent methodologies to measure housing affordability
7. Work with senior levels of government to make their surplus land available for affordable housing.

In 2017, the federal government announced the National Housing Strategy. In the 2018 federal budget, the Strategy was capitalized with a $40 billion investment over 11 years. It is important that this money begin to flow in Mississauga and that each party commits to maintaining the strategy, the funding, and to working with municipal partners to enhance the program to bring more affordable housing online in our community.

Questions for provincial parties and local candidates:

- Do you and your party commit to a National Housing Strategy and to maintaining and enhancing the $40 billion commitment to build affordable housing across Canada, including in Mississauga?

Message to residents, businesses and stakeholders:

- Mississauga residents should be able to live and work in their community without fear of being priced out of the market. Our City needs a committed federal government partner to help incentivize the building of affordable housing.

iv. Strengthening the Federal-Municipal relationship

Over the last 4 years, the relationship between the federal and municipal governments in Canada has been strengthened. For the first time ever, municipalities were invited to attend Federal-Provincial and Territorial (FPT) meetings on infrastructure. Mississauga was asked to attend these meetings twice as a representative of Canada's municipalities. At the same time, the federal government has made unprecedented investments in infrastructure, including $180 billion over 11 years through the Invest in Canada Infrastructure Program.

Infrastructure funding has traditionally been delivered through a bilateral agreement between the federal and provincial governments. The federal government, through the work of FCM and municipalities across Canada, including Mississauga, has allocated funding specifically to municipalities for transit, infrastructure, and green

infrastructure. However, under the bilateral agreements, the provinces control the intake of projects and must approve and then submit projects from municipal governments to the federal government. While municipalities have been allocated funding, there is no guarantee the province will approve our projects.

As such, there is a need to continue to strengthen the bilateral relationship between the federal and municipal government in the years to come. In the 2019 Federal Budget, the federal government provided direct funding to municipalities through a one-time doubling of the Federal Gas Tax. This was done to speed up the flow of money to municipalities as the province has not yet opened the intake for Phase II of the ICIP.

This direct funding model works well for Mississauga and allows us to make investments in our priority areas without seeking approvals from the province. Moreover, it recognizes the strong, steady financial management practices of municipal governments and our ability to make smart investments in priority infrastructure. FCM will be making a similar case to the federal government during the 2019 campaign. As over 80 per cent of Canadians now live in cities, our voice and standing within the federation must be elevated. Cities like Mississauga are quite literally building Canada. As FCM says, city-building is nation building.

It is important that as the 6th largest City in Canada, Mississauga delivers this message to our local federal candidates, party leaders, residents and businesses. The research from Abacus Data prepared for FCM supports this approach.

The questions for political parties and local candidates:

- Do you and your party commit to working with the City of Mississauga and other municipalities on a new funding framework for municipalities that includes permanent and direct funding?

Message to residents, businesses and stakeholders:

- As the 6th largest city in Canada, Mississauga requires a strong relationship with the federal government and direct funding from the federal government to build strong, resilient communities.

TARGET AUDIENCES

The City of Mississauga's provincial election strategy will have three distinct target audiences:

- Political parties and party leaders

- Local party candidates registered with Elections Ontario in Mississauga's 6 provincial ridings
- Residents, businesses, and other important stakeholders in our City.

The overall messages will be tailored to suit each of these audiences in an effort to achieve maximum engagement from each group. For the vast majority of residents, basic messages and information will likely be sufficient. However, for those residents, stakeholders and candidates who wish to learn more, additional corporate reports, technical documents, and reports will be made available on each of our priority issues.

ENGAGEMENT TACTICS

In past federal and provincial election campaigns, the City of Mississauga has employed various engagement tactics with stakeholders and candidates, including:

- Website and online engagement, including social media
- News releases and other public communications activities
- Questionnaire to local candidates and party leaders
- A debate in the Council chambers
- Engaging businesses and residents to seek their input and support
- Partnership with the Region of Peel
- Video and visual content

The election is just under 4 months away, which provides us with adequate time to properly develop a strategy, a suite of tactics, and a roll out schedule in the months to come. As well, many of the materials used during the 2018 provincial campaign can be repurposed quickly and easily for this campaign.

The design of the campaign and the look and feel of the visual collateral will be based off existing materials.

The engagement tactics fall into three categories:

A. General Engagement:

i. News releases and media alerts
ii. Web information, including:
    a. Information for candidates and residents on the City's priority issues
    b. Downloadable and shareable fact sheets
    c. Videos and shareable content including infographics
    d. 'Keep me Posted' email alerts,

e. Short videos on issues
f. Get out the vote' message)

iii. Information links to candidate's running in each riding
iv. Social media outreach
v. Outreach to both mainstream and ethnic media
vi. Partnerships with the Region of Peel and other local municipalities where applicable
vii. Partnerships with other local agencies (i.e. MBOT, Peel Region, United Way, residents' associations, etc.,), as well as industry organizations like FCM and AMO

ii. Targeted Resident and Stakeholder Engagement:

i. Video(s) specific to each of the issues, designed to be easily shareable across multiple media platforms
ii. Printed information (not intended for every household but to be distributed at the City's facilities, public meetings, etc.)
iii. Standardized messages for residents and businesses to send tailored and targeted messages to candidates and parties in support of Mississauga's priorities.
iv. Printable post card for residents and businesses to mail to parties and candidates
v. All stakeholder meeting to inform our key partners about the City's priorities

iii. Targeted Candidate Engagement:

i. Open letter from Mayor to all local candidates*
ii. Open letter with questionnaire to all party leaders
iii. All candidates information forum
iv. Candidate debate**

** The City will only engage with official political parties and local candidates registered with Elections Canada*

*** Note: the candidate debate will be limited to the Progressive Conservative Party of Ontario, the Ontario Liberal Party, the New Democratic Party of Ontario and the Green Party of Ontario. This is based on the criteria accepted by Council during previous election campaigns in 2007 and 2014 where any political party that had achieved one per cent, or greater, of the vote during the previous provincial election, would be included.*

Financial Impact

Total costs for this strategy will not exceed $50,000 if all engagement tactics are all deployed. Costs will be funded through existing local budgets and any costs that cannot be absorbed will be from the contingency reserve.

Conclusion

The City should engage the political parties who wish to govern Ontario, on our key issues of importance. A robust engagement and advocacy strategy supports this goal.

Attachments

Appendix A: Results of 2018 Mississauga Matters provincial election campaign
Appendix B: Public opinion research conducted by Abacus Data on behalf of FCM

Attachments

Appendix 1: Results of 2018 Mississauga Matters provincial election campaign

Appendix 2: Public opinion research conducted by Abacus Data on behalf of FCM

Prepared by: Robert Trewartha, Chief of Staff, Mayor's Office

Mississauga Matters Campaign

Overall [From May 9, 2018 – June 13, 2018]

Total Posts	Total Impressions	Total Engagements	Media Views
51	355,587	13,071	29,248

Twitter [From May 9, 2018 – June 13, 2018]

Total Posts	Total Impressions	Total Engagements	Media Views
26	129,202	3,154	11,259

Facebook [From May 9, 2018 – June 13, 2018]

Total Posts	Total Impressions	Total Engagements	Media Views
21	226,385	9,443	17,989

LinkedIn [From May 9, 2018 – June 13, 2018]

Total Posts	Total Impressions	Total Engagements	Media Views
4	15,346	420	----

PUBLIC OPINION RESEARCH

EVERYTHING IS LOCAL

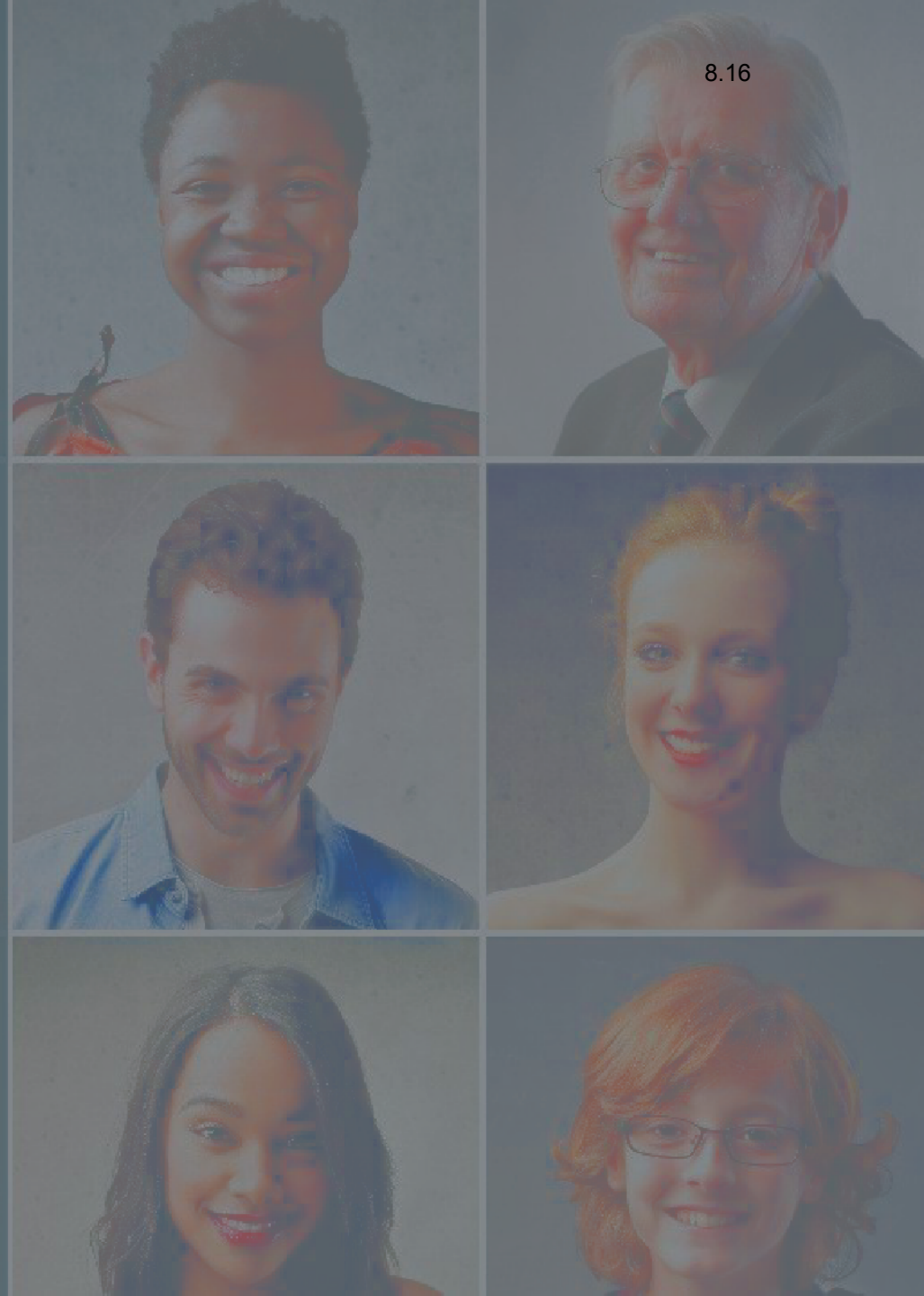
THE ROLE OF MUNICIPALITIES IN CANADIANS' LIVES AND OPINIONS ABOUT NEW FUNDING TOOLS

SPRING 2019

NATIONAL SURVEY OF 5,106 CANADIANS

FCM FEDERATION OF CANADIAN MUNICIPALITIES FÉDÉRATION CANADIENNE DES MUNICIPALITÉS

ABACUS DATA



METHODOLOGY

This study was commissioned by FCM.

The survey was conducted online with 5,106 Canadian residents aged 18 and over, from March 14th to 28th, 2019. A random sample of panelists were invited to complete the survey from a set of partner panels based on the Lucid exchange platform and the Dynata Panel. These partners are typically double opt-in survey panels, blended to manage out potential skews in the data from a single source.

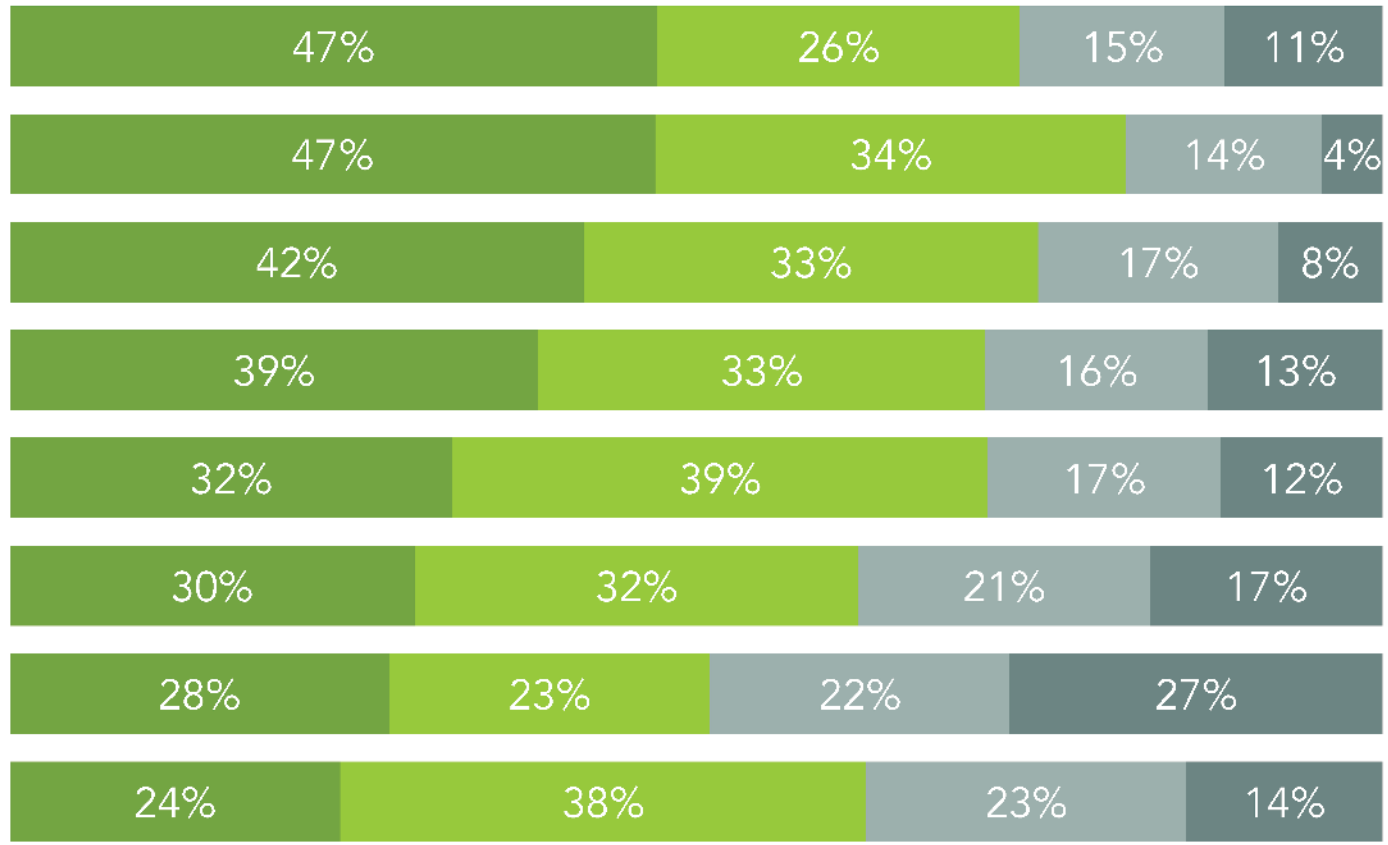
The margin of error for a comparable probability-based random sample of the same size is +/- 1.39%, 19 times out of 20.

The data were weighted according to census data to ensure that the sample matched Canada's population according to age, gender, educational attainment, and region. Totals may not add up to 100 due to rounding.

FINDING #1

MUNICIPAL ISSUES IMPACT PEOPLE'S DAY TO DAY QUALITY OF LIFE.

WHAT IMPACTS YOUR QUALITY OF LIFE?

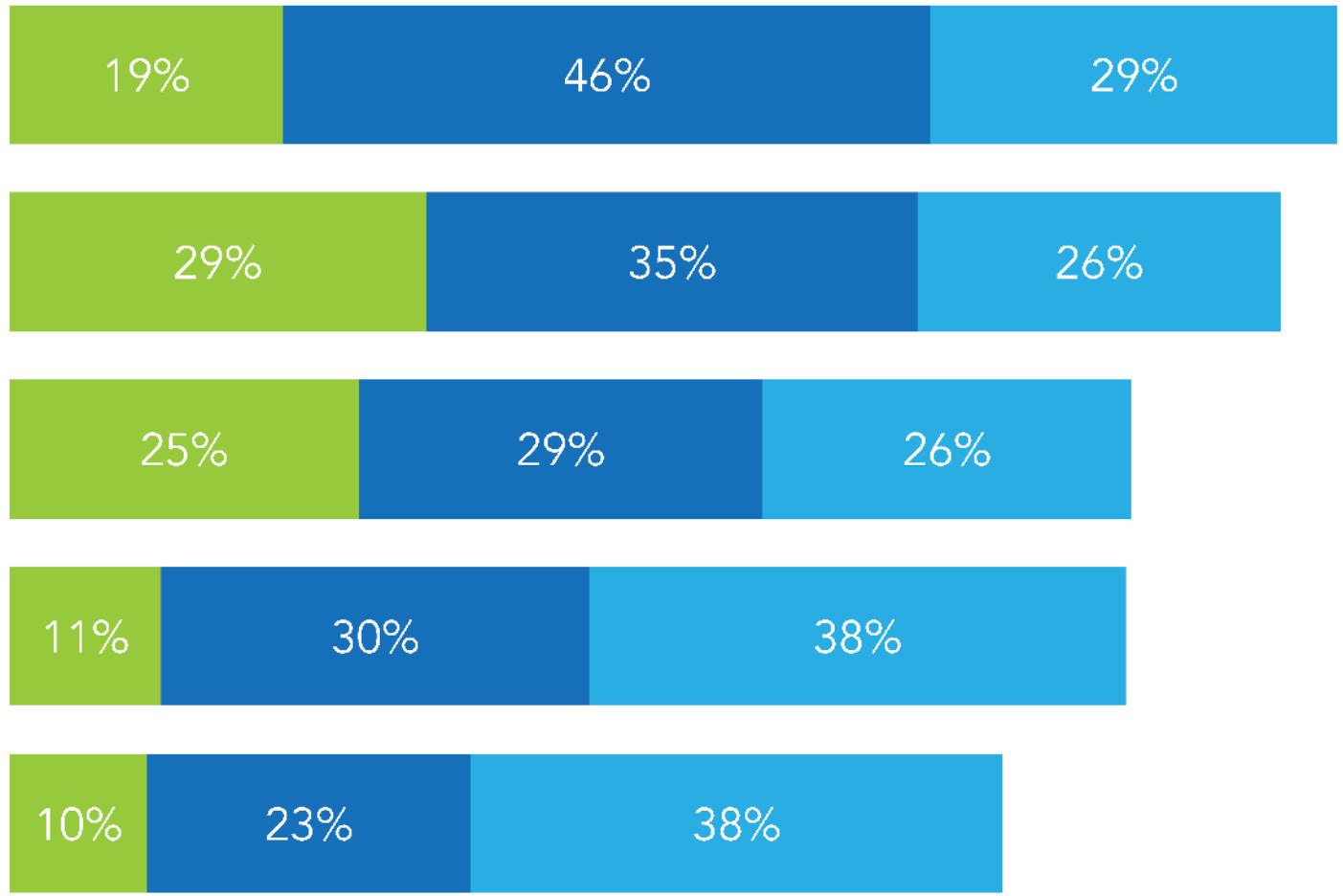


ABACUS DATA

FINDING #2

INFRASTRUCTURE, HOUSING, AND CLIMATE CHANGE ARE PRIORITIES.

HOW MUCH OF A PRIORITY SHOULD EACH BE?

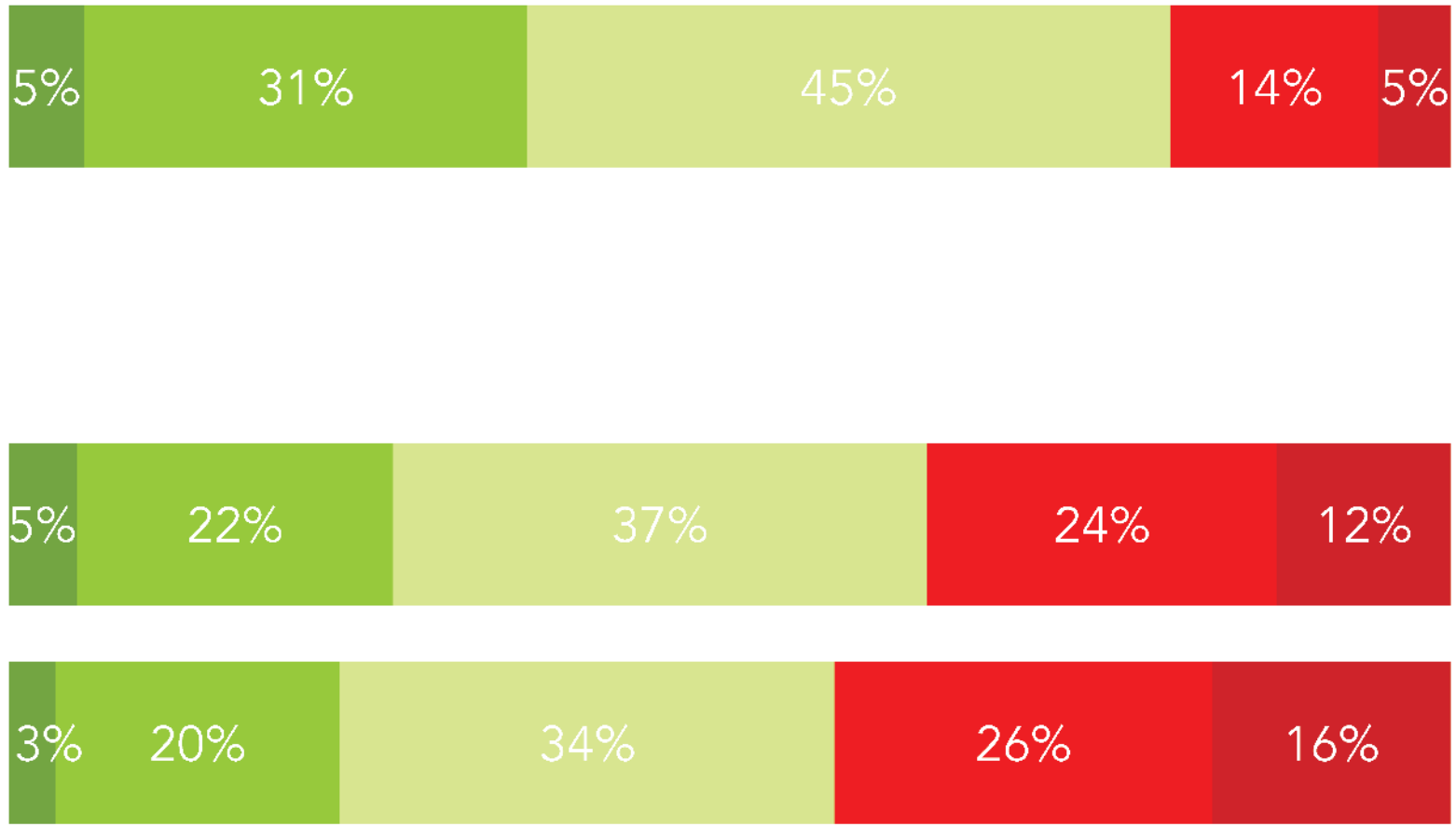


ABACUS DATA

FINDING #3

THE PERFORMANCE OF MUNICIPALITIES IS VIEWED MORE POSITIVELY THAN FEDS OR PROVINCES.

RATING OVERALL PERFORMANCE

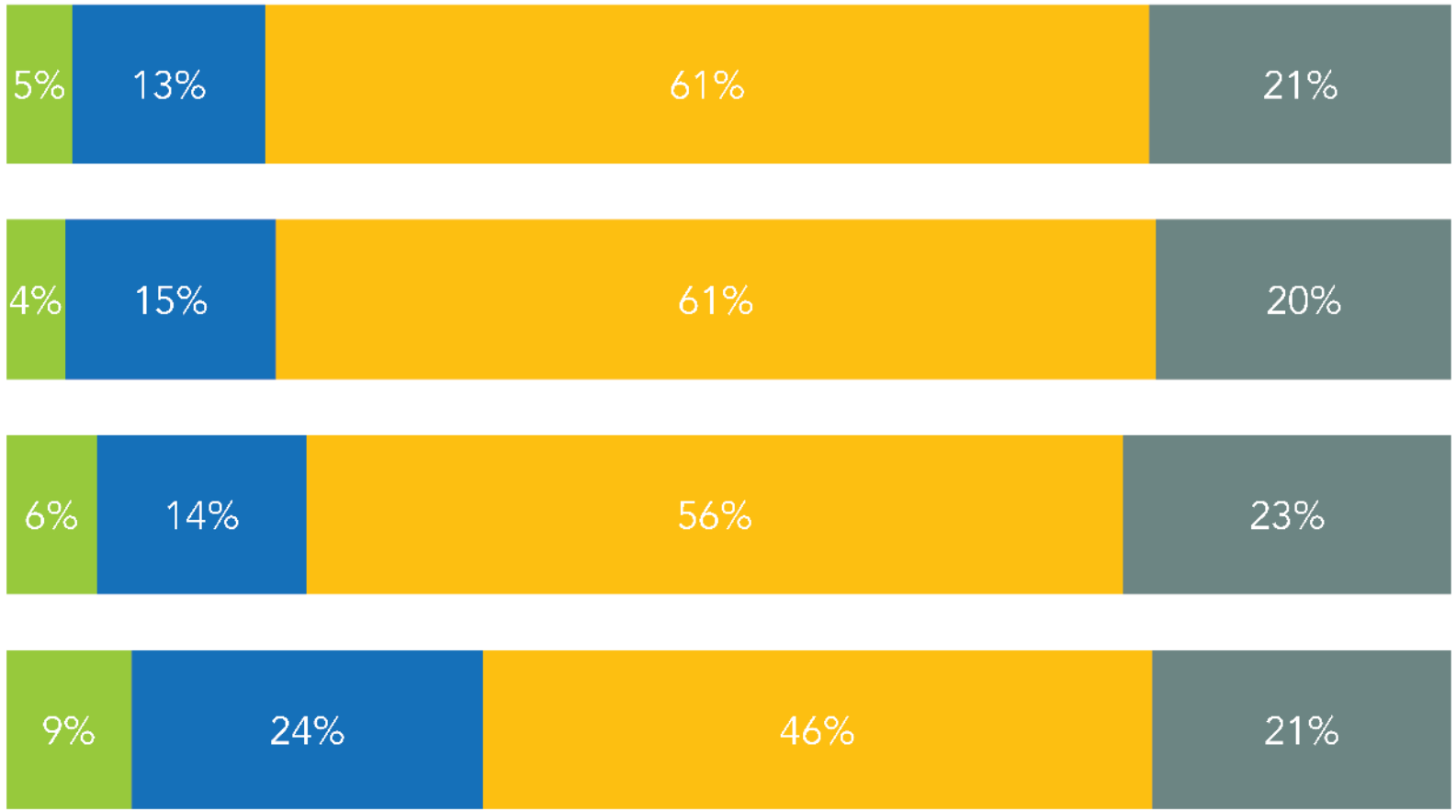


ABACUS DATA

CANADIANS BELIEVE MUNICIPALITIES ARE BEST AT...

UNDERSTANDING LOCAL CHALLENGES.
FINDING LOCAL SOLUTIONS.
IMPROVING QUALITY OF LIFE.
PLANNING AHEAD.

WHICH LEVEL OF GOVERNMENT BEST...



ABACUS DATA

FINDING #4

MOST FEEL THAT THE FEDERAL AND MUNICIPAL LEVELS OF GOVERNMENT DO NOT TALK ENOUGH.

WHEN IT COMES TO MAKING DECISIONS THAT AFFECT YOUR COMMUNITY, DO YOU THINK THE FEDERAL AND MUNICIPAL GOVERNMENTS TALK...

FINDING #5

ALMOST HALF OF CANADIANS DON'T THINK MUNICIPALITIES HAVE ENOUGH RESOURCES TO MAINTAIN AND BUILD INFRASTRUCTURE.

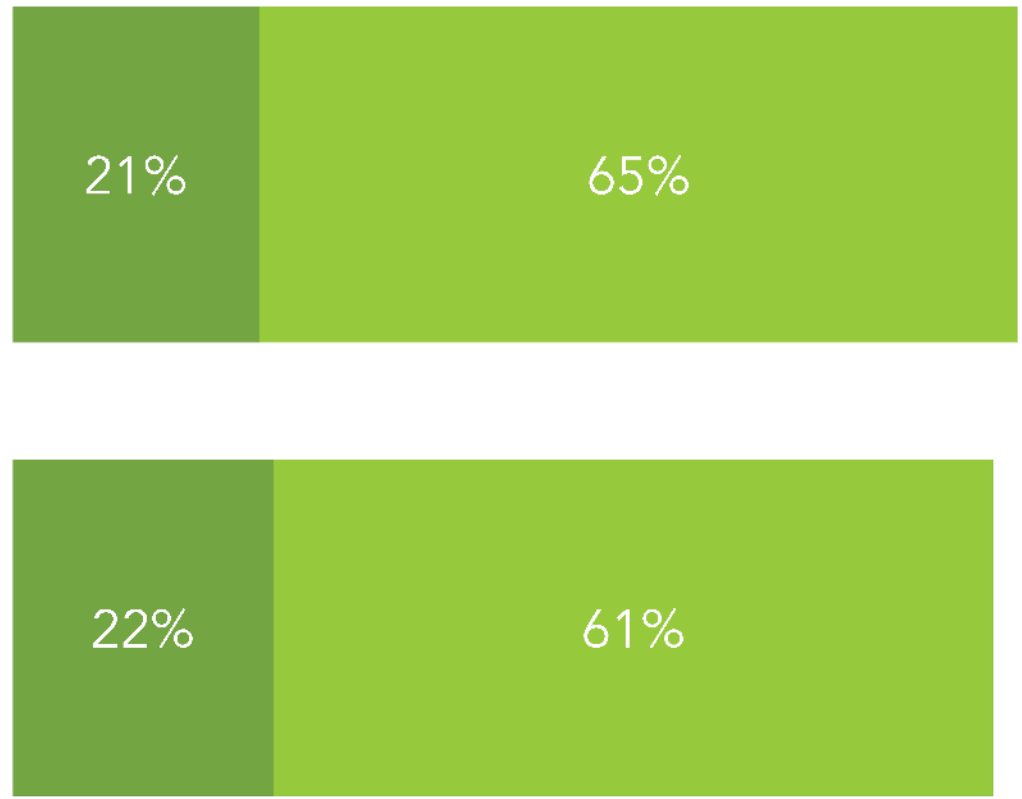
DO YOU THINK YOUR MUNICIPALITY HAS ENOUGH RESOURCES TO MANAGE, MAINTAIN, AND BUILD INFRASTRUCTURE?

ABACUS DATA

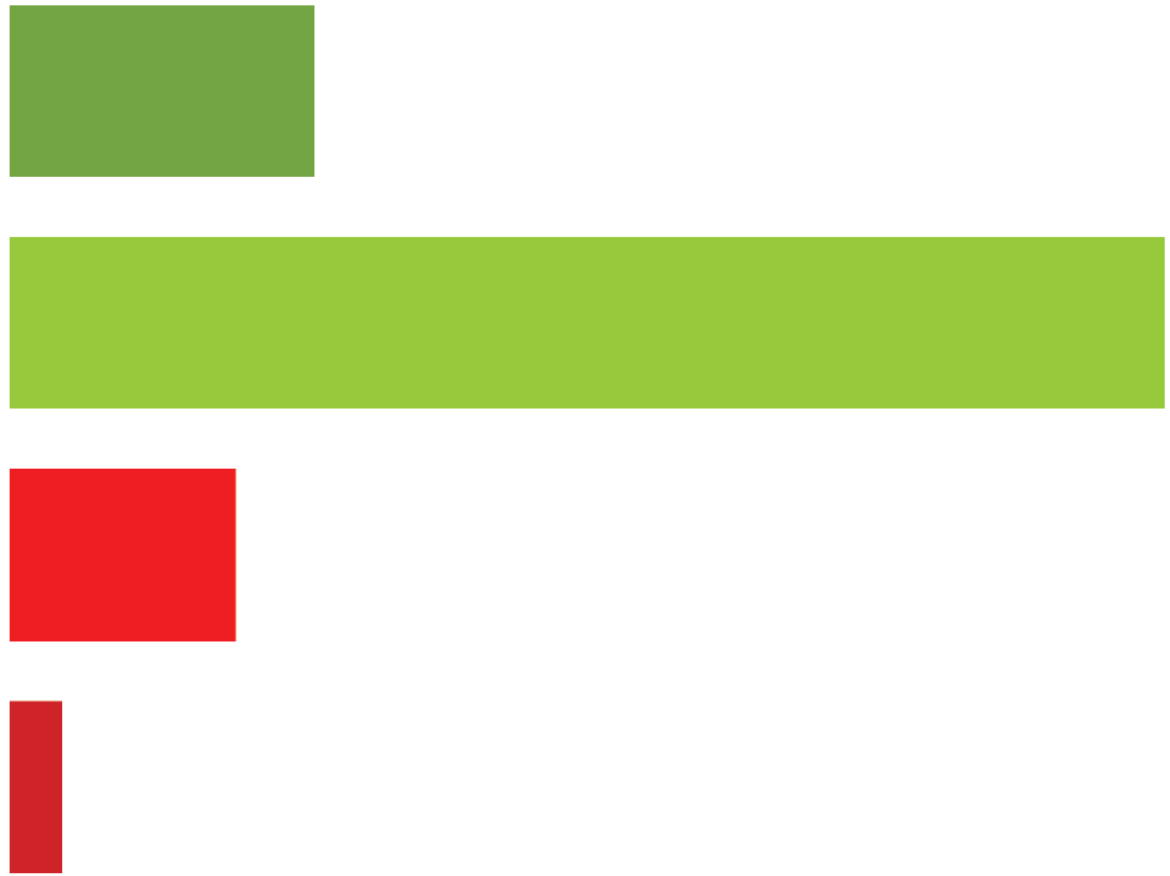
FINDING #6

THERE IS BROAD PUBLIC SUPPORT FOR A NEW FISCAL ARRANGEMENT BETWEEN THE FEDERAL GOVERNMENT AND MUNICIPALITIES.

BIG MAJORITIES THINK IT'S A GOOD IDEA TO GIVE MUNICIPALITIES MORE CONTROL AND REVENUE

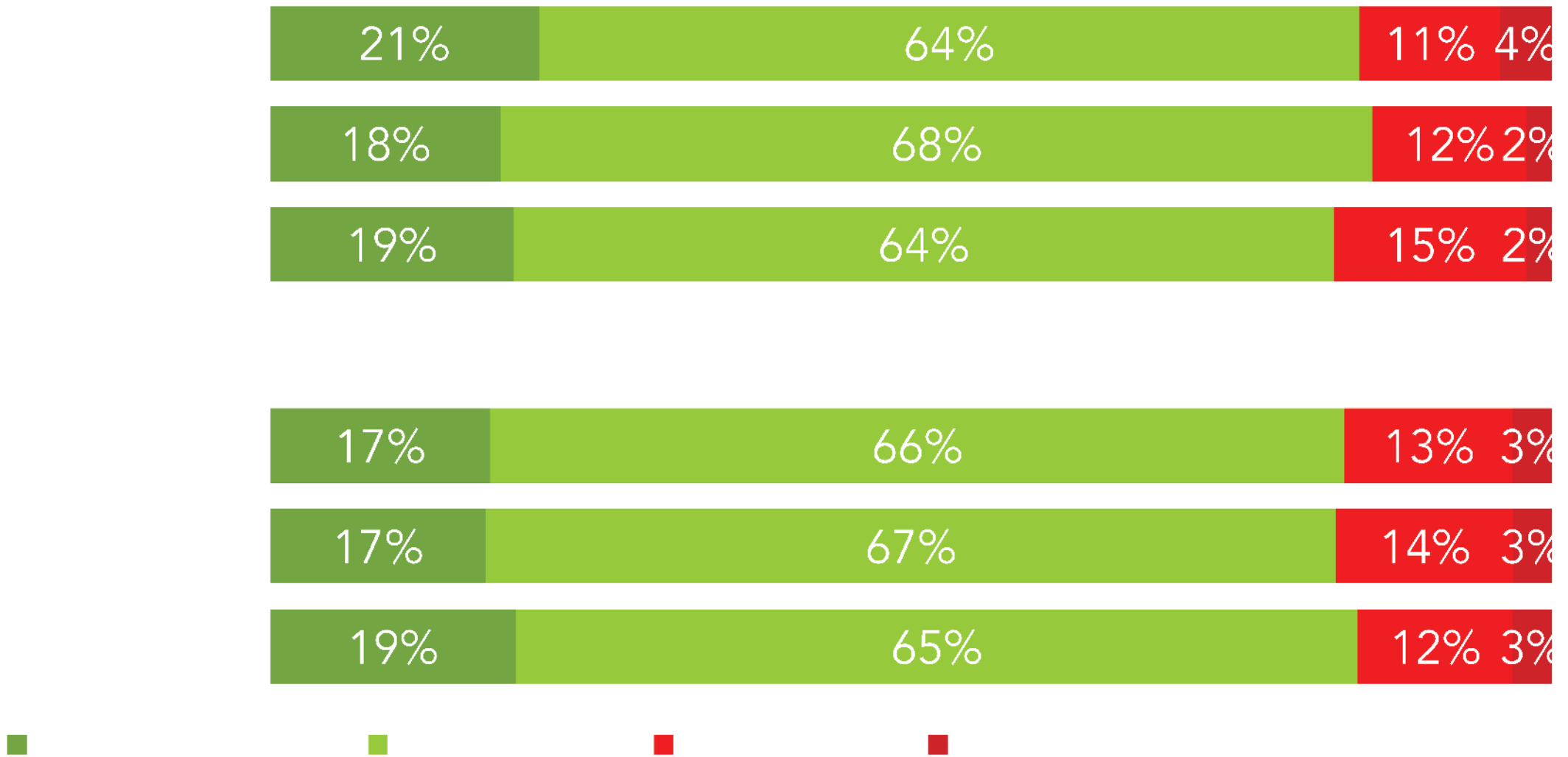


IF A FEDERAL POLITICAL PARTY PROMISED TO GIVE MUNICIPALITIES PERMANENT, DEDICATED FUNDING THAT ALLOWED THEM TO DECIDE WHAT TO SPEND THE MONEY ON...



ABACUS DATA

REACTION TO PROPOSAL FOR PERMANENT NEW FUNDING TOOLS...



ABACUS DATA

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 05/23/2019	Originator's files:
To: Chair and Members of General Committee	
From: Gary Kent, CPA, CGA, ICD.D Commissioner of Corporate Services and Chief Financial Officer	Meeting date: 6/26/2019

Subject
Establishment of Ward-Specific Special Projects

Recommendation
1. That the "Establishment of Ward-Specific Special Projects" report dated May 23, 2019, from the Commissioner of Corporate Services and Chief Financial Officer, be approved;
2. That each Councillor identify projects, within the Council term, up to $2 million according to the guidelines specified in the motion passed on May 22nd, 2019;
3. That the initial Ward-specific projects be created as per Appendix 1 and that funding be allocated from the Tax Capital Reserve (33121) to the respective projects;
4. That funding of amounts identified in Appendix 1 be transferred from the Tax Capital Reserve (33121); and
5. That the necessary by-laws be enacted.

Background
On May 22nd, 2019 a motion was passed by Council to establish capital projects up to a total amount of $2 million per ward, to be used at the discretion of each local Councillor. The motion included the following guidelines that each Councillor agrees to adhere to in assigning funds to projects:

- Capital projects currently unfunded or underfunded in the 2019-2020 budgets
- Projects that can be completed, or close to completion, by the end of this Council term; at which time unused funds will be returned to general revenue
- Projects that fall into the generally accepted categories of federal or provincial infrastructure programs such as recreation, tourism, transit etc.
- The projects recommended in each ward be presented at a regular Council meeting for information and accounting purposes

Comments

Staff will assist the Councillors with cost estimates and project management. Any staff costs that may be required to manage the recommended projects are to be included in cost estimates and will be entirely covered through chargebacks.
Appendix 1 identifies the projects to date. Financial updates on the progress of these projects and any new projects to be established through this initiative will be brought to Council through the quarterly financial variance reports, under the Capital Works in Progress (WIP) section.

During the Council term, staff will adjust any unused funds from completed projects back to the Tax Capital Reserve, through the WIP process. Councillors may continue to identify projects until they reach the $2 million limit. Staff will monitor the balances of spent and uncommitted funds per ward.

As per the motion, projects are to be completed or close to completion by the end of the Council term. Any uncommitted funds at the end of 2022 will be returned to general revenue.

Financial Impact

Projects totalling $2 million per ward will be funded from the Tax Capital Reserve (33121) over the period of the Council term. As projects are identified, staff will be bringing requests to Council to approve the transfer of funds from the Tax Capital Reserve. Projects identified by Councillors will not impact the funding envelopes allocated to each Service Area.

Conclusion

Ward-specific projects as identified by each Councillor are to be established and completed within the Council term. Each Councillor can allocate up to $2 million in total for their projects. Staff will report on these projects regularly through the Capital Works in Progress updates. At the end of this period, any unused funds will be returned to general revenue.

Attachments

Appendix 1: Ward-Specific projects, identified to-date

G. Kent.

Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer

Prepared by: Ann Wong, Sr Mgr Business Planning and Reporting

Appendix 1

Ward-Specific Projects to date

Ward	Project	PN#	Net Budget
5	Malton Sign	C18351	$275,000
5	Creative Ship Playground	C19312	$250,000
5	AVRO Arrow	19351	$500,000
1	Small Arms Building Parking Lot construction	A16491	$250,000

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 2019/05/01	Originator's files:
To: Chair and Members of General Committee	
From: Paul Mitcham, P. Eng, MBA, Commissioner of Community Services	Meeting date: June 26, 2019

Subject
Agreement with Fire Department Safety Officers Association (FDSOA) to deliver Emergency Vehicle Technician (EVT) training at the Garry W. Morden Centre

Recommendation
That a by-law be enacted authorizing the Commissioner of Community Services and the City Clerk to execute and affix the Corporate Seal to an Agreement between the Fire Department Safety Officers Association ("FDSOA") and The Corporation of the City of Mississauga ("City") including such ancillary documents and amending agreements as may be required to give further effect to the intended relationship of the parties herein, all of which must be in form and content satisfactory to the City Solicitor, for the facilitation of Emergency Vehicle Technician (EVT) training programs at the GWMC.

Background
The Garry W. Morden Centre (GWMC) is a highly respected fire training centre site that is home to training for Mississauga Fire and Emergency Services (MFES) staff as well as external agencies. MFES training and operations staff often provide training courses to external fire departments as the site is conducive to classroom, fire ground and specialty training.

The EVT program is recognized as an industry standard for mechanical staff and is delivered internationally by the Fire Department Safety Officers Association (FDSOA). FDSOA is a non-profit corporation whose mission is to promote safety standards and practices in the fire, rescue and emergency services community. They are a registered EVT training provider for The Emergency Vehicle Technician Certification Commission.

MFES currently has seven mechanics that service 80 vehicles. There are 30 front-line emergency response apparatus, nine reserve apparatus, seven unstaffed emergency specialty vehicles and approximately 34 small fleet vehicles. Fleet mechanics for emergency vehicles require ongoing training to ensure they maintain their existing skills and upgrade to adapt to emerging technologies. MFES mechanical staff are currently not EVT trained.

Comments

The GWMC is the second location to be selected as a potential EVT test site in Ontario. It was selected because it has the capacity to hold both classroom training as well as hands on training in the mechanical bays. This agreement provides an opportunity for MFES mechanical staff to receive EVT training at no cost as well as enhancing the reputation of the GWMC as a test site.

EVT training is a nationally recognized training standard and focuses around requirements outlined in the National Fire Protection Association (NFPA) 1911 (Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Emergency Vehicles), 2017.

The significant terms of the Agreement are as follows:

1. The term of the agreement is for a 5 year period effective from the date it is executed.

2. The FDSOA will carry out all of the training services. These include but are not limited to:

    a. Inspection, Maintenance & Testing of Fire Apparatus
    b. Electrical Systems, Fire Pumps & Accessories
    c. Aerial Fire Apparatus and Automatic Transmissions

3. The training will be delivered to both MFES staff as well as external agencies.

4. Training will be in accordance with NFPA 1911 (Standard for the Inspection, Maintenance, Testing and Retirement of In-Service Emergency Vehicles), 2017.

5. In exchange for renting the Garry W Morden Centre (GWMC) at no cost, FDSOA will provide the training and certification to MFES staff at no cost.

6. For all training FDSOA undertakes that does not include MFES staff, defined GWMC rental rates will apply.

Financial Impact

For the first three years of the agreement MFES staff will be trained at no cost to the City. Following the training of MFES internal staff, FDSOA will use the GWMC as a host site to train external agencies. At that time, as part of the agreement they will rent classroom space at the GWMC at posted rental rates. It is estimated that this will generate between $3,000 and $12,000 revenue annually subject to the number of sessions hosted to a maximum of four per year.

Conclusion

The vision of MFES is to be a Global Leader. A partnership with FDSOA for EVT training at the GWMC will advance that vision and propel the GWMC towards becoming a centre of excellence for fire and emergency services training.

Paul Mitcham, P. Eng, MBA, Commissioner of Community Services

Prepared by: Tim Beckett, Fire Chief

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 6/4/2019

To: Chair and Members of General Committee

From: Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer

Originator's files: PO.11.QUE

Meeting date: 6/26/2019

Subject
Surplus Declaration of City lands adjacent to 3130 Queen Frederica Drive (Ward 3)

Recommendation
1. That the Corporate Report titled "Surplus Declaration of City lands adjacent to 3130 Queen Frederica Drive" dated June 4, 2019 from the Commissioner of Corporate Services & Chief Financial Officer, be received.

2. That City lands adjacent to 3130 Queen Frederica Drive, located north of Dundas Street, and operating as a private driveway for the Peel Housing Corporation and containing an area of approximately 5,586.19 square meters (60,129.24 square feet), be declared surplus to the City's requirements for the purpose of sale and transfer to Peel Housing Corporation, and legally described under the *Land Titles Act* as PIN13335-0150 (LT), BLK C, PL 784, Toronto, Mississauga, in the City of Mississauga, Regional Municipality of Peel, in Ward 3.

3. That Realty Services staff be authorized to proceed to dispose of the subject lands to be declared surplus at nominal value.

4. That all steps necessary to comply with the requirements of Section 2.(1) of the City Notice by-law 215-08 be taken, including giving notice to the public by posting a notice on the City of Mississauga's website for a two week period, where the expiry of the two week period will be at least one week prior to the execution of an agreement for the sale of the subject lands.

Background
The City is the registered owner of a parcel of land adjoining 3130 Queen Frederica Drive, which City-owned lands are legally described as PIN 13335-0150 being Block C, on Plan 784, TORONTO, MISSISSAUGA.

Upon creation of the Region of Peel, the property at 3130 Queen Frederica and 3170 Queen Frederica transferred into the jurisdiction of the Region, and the site was subsequently developed with social housing and is now under the jurisdiction of the Peel Regional Housing Corporation.

The adjoining City-owned parcel identified above did not transfer to the Region of Peel at that time as it appears to have been identified as a potential road allowance. The road was never opened, however was developed and presents itself as road which now serves as a private driveway to the Peel Housing developments at 3130 and 3170 Queen Frederica Drive which are located on either side of this unopened road allowance. But for it being identified as a potential road allowance, this City-owned asset would have been transferred to the Region together with 3130 and 3170 Frederica Drive.

Comments

The Regional Municipality of Peel approached the City to request the transfer of the City's adjoining lands (the driveway) in order that they may be incorporated into the Peel Housing development. As the Region maintains the sidewalks, boulevards, and the driveway, it is reasonable to transfer the lands to the Region.

Realty Services has completed its circulation and received confirmation that there are no concerns with the lands being declared surplus to the City's requirements and sold. There are two storm water catch basins on the property, but as they serve only the Peel Housing development itself, these are deemed to be private and will not be subject to an easement in favour of the City.

The lands will have been circulated to external utility companies and in the event of unregistered property interests, easement protection shall be provided as may be required.

Prior to the sale of the subject lands, public notice will have been given by the posting of a notice of proposed sale on the City of Mississauga's website for a two week period, where the expiry of the two week period will be at least one week before the execution of the agreement for the sale of the said lands. This notice satisfied the requirements of the City Notice By-law 0215-2008, as amended by by-law 0376-2008.

An Agreement of Purchase and Sale to convey the subject property to the Regional Municipality of Peel as the abutting owner will be processed pursuant to Delegated Authority By-Law 0148-2018.

Financial Impact

There is no financial impact from declaring the lands surplus. The lands will be transferred to the Region for nominal consideration.

Conclusion

As the City parcel identified in this report is not required for City municipal purposes, it is reasonable to declare this parcel surplus to the City needs for transfer to the Region. In the event that the subject lands are encumbered with any unregistered property interests, easement protection will be established prior to disposition.

Attachments

Appendix 1: Approximate location of lands to be declared surplus

G. Kent.

Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer

Prepared by: William Moffatt, Supervisor Capital Acquisitions, Realty Services, Facilities & Property Management

MISSISSAUGA

Corporate Services

Realty Services

3130 Queen Frederica Drive
Surplus Declaration
Approximate Location of Subject Lands

This is not a Plan of Survey

SCALE FOR REDUCED DRAWINGS

0m 8m 15m 31m 46m 62m 77m 154m

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 6/6/2019	Originator's files: PO.11.PRE
To: Chair and Members of General Committee	
From: Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer	Meeting date: 6/26/2019

Subject

Proposed Stop-up, Close, Declare Surplus and Sell a portion of Premium Way and a portion of Dickson Road (Ward 7)

Recommendation

1. That the Corporate Report titled "Proposed Stop-up, Close, Declare Surplus and Sell a portion of Premium Way and a portion of Dickson Road", dated June 6, 2019, from the Commissioner of Corporate Services and Chief Financial Officer, be received.

2. That a by-law be enacted authorizing the closure of a portion of Premium Way road allowance and a portion of Dickson Road road allowance, north of the Queen Elizabeth Way ("QEW") and west of Hurontario Street, being comprised of approximately 136.80 square metres (1,472.50 square feet), and legally described as Part Lot 5, Range 2, Credit Indian Reserve, designated as Parts 1 and 2 on draft Reference Plan, prepared by S. Sinnis, Ontario Land Surveyor, Stantec Geomatics Ltd., dated January 17, 2019, *Land Titles Act* PIN #13359-2529(LT).

3. That Parts 1 and 2 on draft Reference Plan prepared by S. Sinnis, Ontario Land Surveyor, Stantec Geomatics Ltd., dated January 17, 2019, being comprised of approximately 136.80 square metres (1,472.50 square feet), be declared surplus to the City's requirements for the purpose of a proposed sale to Trans-Northern Pipelines Inc. ("TNPI") in connection with the QEW Credit River Bridge Project (the "QEW Project").

4. That all steps necessary to comply with the requirements of Section 2.(1) of the City Notice by-law 215-08 be taken, including giving notice to the public by posting a notice on the City of Mississauga's website for a two week period, where the expiry of the two week period will be at least one week prior to the execution of an agreement for the sale of the subject lands.

5. That, following Council approval of the road closure and surplus declaration, easements be granted to protect the existing services and utilities within Parts 1 and 2

on draft Reference Plan prepared by S. Sinnis, Ontario Land Surveyor, Stantec Geomatics Ltd., dated January 17, 2019, if necessary.

Background

By its adoption of Recommendation GC-0497-2018 on June 27, 2018, Council approved that Transportation and Works be permitted to enter into an agreement with Ontario Ministry of Transportation ("MTO") to formalize funding and other matters relating to the construction, operation, maintenance and future renewal of the active transportation crossings and multi-use trails associated with the QEW Project.

TNPI, in connection with the QEW Project, requested to purchase a portion of the Premium Way/Dickson Road, road allowance to be used to construct a new above ground valve compound to house TNIPI's 273.1 mm outer diameter and 508 mm outer diameter refined low vapour pressure hydrocarbon product pipelines, which is to be relocated immediately north of the Credit River pipeline crossings.

Comments

Realty Services has completed its circulation and no objections were received to the closure of Parts 1 and 2 on draft Reference Plan prepared by S. Sinnis, Ontario Land Surveyor, Stantec Geomatics Ltd., dated January 17, 2019 and to the surplus declaration of Parts 1 and 2 on draft Reference Plan prepared by S. Sinnis, Ontario Land Surveyor, Stantec Geomatics Ltd., dated January 17, 2019.

A circulation to various utility companies has been undertaken and easement protection over Parts 1 and 2 on draft Reference Plan prepared by S. Sinnis, Ontario Land Surveyor, Stantec Geomatics Ltd., dated January 17, 2019 shall be granted, if required.

Notice of the road closure contemplated in this report has been undertaken to satisfy the requirements of the City Notice By-law 0215-2008, as amended by By-law 0376-2008. Once the closure and the surplus declaration are completed, City staff will negotiate with TNPI towards the completion of a sale.

It is anticipated that the sale price of the subject property will not be greater than $1,000,000, which is within the limit authorized for the approval and execution of real estate agreements under Real Estate Delegation Authority By-Law 0418-2018. Subsequently, following successful negotiations for the sale of the City-owned lands to TNPI, the Agreement of Purchase and Sale, any other ancillary documents or agreements required, will be executed by the appropriate level of authority as outlined under By-Law 0418-2018.

Originators files: PO.11.PRE

Financial Impact

There is no financial impact from declaring the lands surplus. There will, however, be revenue generated to the City by the subsequent sale.

Conclusion

The subject portion of Premium Way, and Dickson Road, road allowance is not required for municipal purposes and can be permanently closed. It is reasonable to declare the lands surplus in order to facilitate the proposed sale to TNPI in connection the the QEW Project.

Attachments

Appendix 1: Approximate location of the portion of Premium Way/Dickson road allowance to be closed and lands to be declared surplus

Appendix 2: Draft Reference Plan showing the portion of Premium Way and Dickson Road to be closed and declared surplus, prepared by S. Sinnis, Ontario Land Surveyor, Stantec Geomatics Ltd., dated January 17, 2019

G. Kent.

Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer

Prepared by: Susy Costa, Project Leader, Realty Services, Facilities & Property Management


8.20
DICKSON ROAD
DICKSON PARK CRESCENT
PREMIUM WAY
QUEEN ELIZABETH WAY
ELIZABETH
This is not a Plan of Survey
MISSISSAUGA
Corporate Services
Realty Services
Part of Premium Way
Proposed Stop-up, Close, Declare Surplus and Sell
Approximate Location of Subject Lands
SCALE FOR REDUCED DRAWINGS
0m 8m 15m 31m 46m 62m 77m 154m

21 January, 2019 1:24 PM

SCHEDULE				
PART	LOT	CONCESSION	PIN	AREA
1	PART OF LOT 5, RANGE 2	CREDIT INDIAN RESERVE	PIN 13359-2529(LT)	135.69 m²
2	PART OF LOT 5, RANGE 2	CREDIT INDIAN RESERVE	PIN 13359-1361(LT)	1.11 m²
3	PART OF LOT 5, RANGE 2 PART OF THE ROAD ALLOWANCE BETWEEN RANGES 2 & 3, CREDIT INDIAN RESERVE	CREDIT INDIAN RESERVE	PIN 13359-2529(LT)	66.71 m²

PARTS 1 & 3 COMPRISES A PART OF PIN 13359-2529(LT)
PART 2 COMPRISES A PART OF PIN 13359-1361(LT)

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.

DATE: _____

_____

PLAN 43R-_____
RECEIVED AND DEPOSITED

DATE: _____

_____
REPRESENTATIVE FOR THE LAND REGISTRAR FOR THE LAND TITLES DIVISION OF PEEL (43).

PLAN OF SURVEY OF

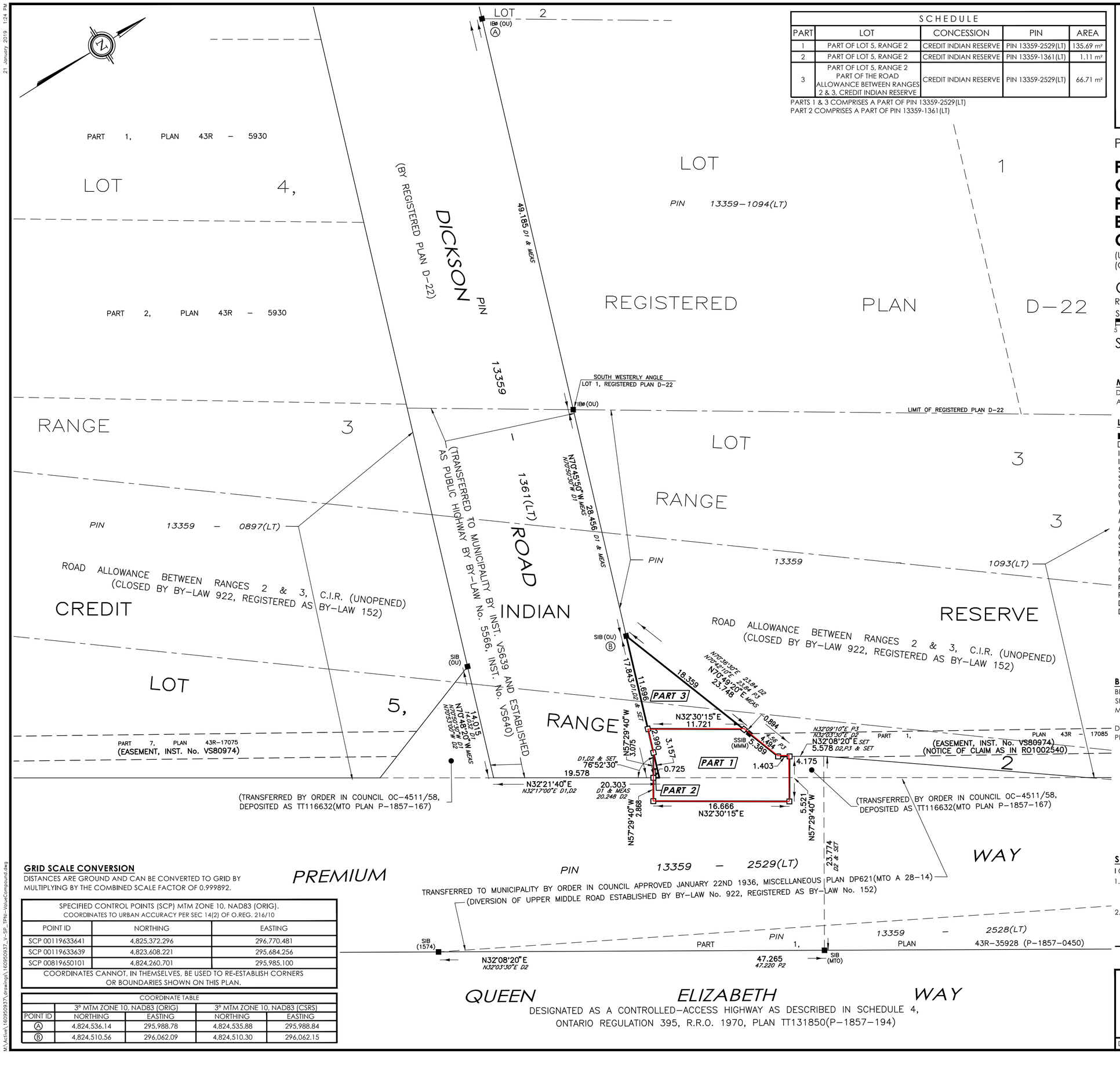
PART OF LOT 5, RANGE 2 CREDIT INDIAN RESERVE AND PART OF THE ROAD ALLOWANCE BETWEEN RANGES 2 & 3, CREDIT INDIAN RESERVE

(UNOPENED)(CLOSED BY BY-LAW No. 922, REGISTERED AS BY-LAW No. 152)
(GEOGRAPHIC TOWNSHIP OF TORONTO)

CITY OF MISSISSAUGA
REGIONAL MUNICIPALITY OF PEEL
Scale 1:300

5 0 5 10 15 20 METRES

Stantec Geomatics Ltd.



METRIC CONVERSION

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

LEGEND

■	DENOTES	FOUND MONUMENTS
□	"	SET MONUMENTS
IB	"	IRON BAR
IBØ	"	ROUND IRON BAR
SIB	"	STANDARD IRON BAR
SSIB	"	SHORT STANDARD IRON BAR
CC	"	CUT CROSS
CP	"	CONCRETE PIN
WIT	"	WITNESS
PIN	"	PROPERTY IDENTIFICATION NUMBER
M/MEAS	"	MEASURED
PROP	"	PROPORTIONED
OU	"	ORIGIN UNKNOWN
STANTEC	"	STANTEC GEOMATICS LTD.
MTO	"	MINISTRY OF TRANSPORTATION ONTARIO
1574	"	DELPH & JENKINS O.L.S.
C.I.R.	"	CREDIT INDIAN RESERVE
P1	"	REGISTERED PLAN D-22
P2	"	PLAN 43R-35928
P3	"	PLAN 43R-17085
D1	"	INSTRUMENT No. VS640
D2	"	INSTRUMENT No. TT116632(P-1857-167)

BEARING NOTE

BEARINGS ARE UTM GRID, DERIVED FROM GPS OBSERVATIONS FROM MONUMENT A TO B, SHOWN HEREON, HAVING A BEARING OF N70°45'50"W REFERRED TO THE CENTRAL MERIDIAN OF UTM ZONE 17 (81° WEST LONGITUDE) NAD83 (CSRS) (2010.0).

D1 & D2 - COMPARISONS SHOWN ARE WITH ASTRONOMIC BEARINGS ON UNDERLYING PLANS

GRID SCALE CONVERSION

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999892.

SPECIFIED CONTROL POINTS (SCP) MTM ZONE 10, NAD83 (ORIG). COORDINATES TO URBAN ACCURACY PER SEC 14(2) OF O.REG. 216/10		
POINT ID	NORTHING	EASTING
SCP 00119633641	4,825,372.296	296,770.481
SCP 00119633639	4,823,608.221	295,684.256
SCP 00819650101	4,824,260.701	295,985.100
COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.		

COORDINATE TABLE				
	3° MTM ZONE 10, NAD83 (ORIG)		3° MTM ZONE 10, NAD83 (CSRS)	
POINT ID	NORTHING	EASTING	NORTHING	EASTING
Ⓐ	4,824,536.14	295,988.78	4,824,535.88	295,988.84
Ⓑ	4,824,510.56	296,062.09	4,824,510.30	296,062.15

SURVEYOR'S CERTIFICATE

I CERTIFY THAT :

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE DAY OF , 2019.

_____ DATE

_____ S. SINNIS
ONTARIO LAND SURVEYOR

Stantec Geomatics Ltd.
CANADA LANDS SURVEYORS
ONTARIO LAND SURVEYORS
300-675 COCHRANE DRIVE, WEST TOWER
MARKHAM, ONTARIO, L3R 0B8
TEL. 905.944.7777
stantec.com

DRAWN: BL	CHECKED: SS	DATE: January 17, 2019	PROJECT No.: 160950937

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Appendix 2

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 6/10/2019	Originator's files:
To: Chair and Members of General Committee	
From: Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer	Meeting date: 6/26/2019

Subject
Hiring Retired City of Mississauga Employees (01-01-09) Policy

Recommendation

That the revised Hiring Retired City of Mississauga Employees Policy (01-01-09), attached as Appendix 1 to this Corporate Report dated June 10th from the Commissioner of Corporate Services and Chief Financial Officer, be approved.

Background
The Hiring Retired City of Mississauga Employees Policy (01-01-09) was last reviewed and revised in June, 2012 to ensure the following:

- reference to the OMERS definition of a bona fide termination; and
- clarification to the rehire conditions.

During this recent review, Human Resources worked closely with high user clients of this policy and took their feedback into consideration.

Key elements that needed to be either clarified or addressed in this policy review included;

- clarification of the definition of retired employee at the City of Mississauga;
- stronger alignment of our rehire policy with OMERS Regulation Guidelines;
- clarification around the conditions and criteria for which rehiring a Retiree is acceptable;
- consideration to add flexibility into conditions of hire to allow high user clients more ability to resource their vacancies efficiently; and
- clarification of benefit entitlements for rehired Retirees at the City.

Comments

The City of Mississauga continues to recognize that in specific circumstances a City retiree, who is in receipt of an OMERS pension, may be considered for reemployment due to their City specific experience and knowledge. The key additions and amendments to the Hiring Retired City of Mississauga Employees policy are summarized below.

- Definition of Retiree was added for clarification, specifically a "Retiree means a former employee who is either retired from the City of Mississauga to an OMERS pension or retired and taking a Deferred OMERS Pension (DP)."

- Definition of Retiree was further clarified to identify that an employee who chooses to take the commuted value of their OMERS pension is considered to have resigned and are not considered to be Retiree and would not be subject to the provisions of this policy.

- Rehire conditions were revised to increase the maximum period of full-time temporary continuous work from 9 months to 12 months, as the majority of contracts required are typically 12 months in duration. A Retiree may only be rehired once for a 12 month contract.

- In order to accommodate the short –term temporary staffing needs for different business units using this policy, new language was added to indicate a Retiree may be hired on an as needs/on call basis to fill short-term work assignments. Each assignment must be for a period of less than six months.

- Added criteria for consideration when rehiring a City Retiree.

- New language added to clarify a Retiree may be eligible for a Health Spending Account for the duration of the contract; however, they cannot be enrolled in the City of Mississauga's Early Retiree Benefit Plan.

Financial Impact

There are no financial impacts resulting from the recommendations of this report.

Conclusion

The recommended changes to the Hiring Retired City of Mississauga Employees policy will ensure this policy aligns with the OMERS Regulations and Guidelines; clarifies language regarding the definition of a Retiree as well as adds flexibility into the conditions of the type and length of contracts for rehired City retirees.

Attachments

Appendix 1: Revised Hiring Retired City of Mississauga Employees policy (01-01-09)

Appendix 2: Comparison of Current and Proposed Policy – Hiring Retired City of Mississauga Employees

Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer

Prepared by: Christine Gabany, Manager, Talent Acquisition

City of Mississauga

Corporate Policy & Procedure

MISSISSAUGA

Policy Title: Hiring Retired City of Mississauga Employees

Policy Number: 01-01-09

Draft Only Clean Copy - May 16, 2019

Section:	**Human Resources**	Subsection:	**Recruitment**
Effective Date:	**July 4, 2012**	Last Review Date:	**October 2017**
Approved by: **Council**		Owner Division/Contact: **Human Resources**	

Policy Statement

Retirees may be rehired only in accordance with this policy, which adheres to Ontario Municipal Employees Retirement System (OMERS) Regulation Guidelines.

Purpose

The purpose of this policy is to ensure that such candidates are rehired in a manner that complies with the Employee Recruitment policy and current OMERS requirement for a bona fide termination. An OMERS bona fide termination occurs only when an employee fully severs his or her employment relationship. For example, the employee loses both seniority and benefits and is issued a Record of Employment.

Scope

All Retirees, defined below, are subject to the rehire conditions of this policy.

All unionized employees are covered by this policy, which adheres to OMERS Regulation Guidelines when a collective agreement is silent.

Definitions

For the purposes of this policy:

Retiree means a former employee who is either retired from the City of Mississauga to an OMERS pension or retired and taking a Deferred OMERS Pension (DP). Employees who choose to take the commuted value of their pension are considered to have resigned and are not considered to be Retirees for the purposes of this policy so are treated as any other external candidate.

Rehire Conditions

Retirees may be rehired by the City as follows:

- When hired to work on a part-time basis:
  - Work will be limited to a maximum of 24 hours per week (maximum 48 hours in a pay period) for a duration of no longer than twelve months
- When hired on a full-time temporary basis (full-time hours):
  - Limited to a maximum of one twelve month continuous period of work (e.g. maternity leave backfill) and/or
  - On an as needs/on call basis to fill short-term work assignments. Each assignment must be for a period of less than six months

Note: Temporary part-time employees working in Recreation programs employed for less than five hours per week are not subject to a maximum duration for their term of employment.

The following criteria should be considered when rehiring City Retirees:

- Urgency to fill position
- Unable to find comparable skills, and
- Operational pressures require contingency staff

Benefit Entitlement

When retired full-time City of Mississauga employees are hired for a twelve month contract they may be eligible for the Health Spending Account (HSA), consistent with the eligibility requirements. However, an employee cannot qualify for the HSA if they are already enrolled in the City of Mississauga Early Retiree Benefit Plan.

Exceptions

Exceptions to this policy may be made only with the written approval of the City Manager and the department head, in consultation with the Director of Human Resources, and will be made only in accordance with the OMERS Regulation Guidelines.

Revision History

Reference	Description
AC-0003-2007(2)	
April 11, 2007	Amended by Resolution 0083-2007
2008 02 14	Housekeeping - *Employment Standards Act, 2000*

GC-0505-2012	Scheduled review to ensure compliance with all legislation and regulations.

Comparison of Current and Proposed Policy – Hiring Retired City of Mississauga Employees

Current Policy – What Exists Today in Hiring Retired City of Mississauga Employees	*Proposed Policy – If the information in a specific section is unchanged, or has required minimal revision to terminology only, "No change" will appear.*	*Rationale – Why changes (deletions and/or additions) to the revised policy were made.*
POLICY STATEMENT Employees who have retired on an OMERS pension from a full-time position with the City of Mississauga may be re-hired only in accordance with this policy, which adheres to OMERS Regulation Guidelines.	**POLICY STATEMENT** Retirees may be rehired only in accordance with this policy, which adheres to Ontario Municipal Employees Retirement System (OMERS) Regulation Guidelines.	Revised to align with new "Retiree" definition.
PURPOSE The purposes of this policy are: • To provide guidance in the re-hiring of retired full-time, City of Mississauga employees to ensure the transfer of corporate knowledge and provide for special skills required by the City, and • To ensure that such candidates are not re-hired in a manner that violates the OMERS defined requirement for a bona fide termination, as amended from time to time. An OMERS bona fide termination occurs only when an employee fully severs his or her employment relationship; for example, the employee loses both seniority and benefits, and is issued a Record of Employment	**PURPOSE** The purpose of this policy is to ensure that such candidates are rehired in a manner that complies with the Employee Recruitment policy and current OMERS requirement for a bona fide termination. An OMERS bona fide termination occurs only when an employee fully severs his or her employment relationship. For example, the employee loses both seniority and benefits and is issued a Record of Employment.	Revised to align with new definition of Retiree and remove reference to knowledge transfer, as this is not within the Scope of the policy. Added reference to the Employee Recruitment policy.
SCOPE All former full-time permanent employees currently receiving an OMERS pension are covered by this policy.	**SCOPE** All Retirees, defined below, are subject to the rehire conditions of this policy.	Revised for clarity and to align with the new definition of "Retiree".

Current Policy – What Exists Today in Hiring Retired City of Mississauga Employees	***Proposed Policy – If the information in a specific section is unchanged, or has required minimal revision to terminology only, "No change" will appear.***	***Rationale – Why changes (deletions and/or additions) to the revised policy were made.***
All unionized employees are covered by this policy, which adheres to OMERS Regulation Guidelines, and in accordance with their collective agreements.	All unionized employees are covered by this policy, which adheres to OMERS Regulation Guidelines when a collective agreement is silent.	Minor rewording for clarity.
	DEFINITIONS For the purposes of this policy: "Retiree" means a former employee who is either retired from the City of Mississauga to an OMERS pension or retired and taking a Deferred OMERS Pension (DP). Employees who choose to take the commuted value of their pension are considered to have resigned and are not considered to be Retirees for the purposes of this policy so are treated as any other external candidate.	A definition for retiree has been included for clarity and ease of reading.
REHIRE CONDITIONS Prior to re-hiring the employee, a determination must be made as to whether or not an employer/employee relationship will exist. Refer to Corporate Policy and Procedure - Human Resources - Employment Status for information on employer/employee relationships and classifications of employees.	**REHIRE CONDITIONS**	This information is covered in the Employment Status policy so is not required in this policy.

Current Policy – What Exists Today in Hiring Retired City of Mississauga Employees	***Proposed Policy – If the information in a specific section is unchanged, or has required minimal revision to terminology only, "No change" will appear.***	***Rationale – Why changes (deletions and/or additions) to the revised policy were made.***
Where the work will be performed in a manner that constitutes an employer/employee relationship, the individual may be re-hired as a temporary contract employee; or as a part-time employee. Where the work will be performed in a manner which does not constitute an employer/employee relationship, the individual will not be classified as an employee and the acquisition of his or her services will be subject to the City's purchasing by-law.		
When hired to work on a part-time basis, work will be limited to 24 hours per week or less (maximum 48 hours in a pay period) for duration of no longer than twelve months of continuous part-time employment. When hired on a temporary contract basis, the contract will be limited to a maximum nine month period of work. The scope of the work must be either to undertake a special project, work during a transition period, or to assist in the training of the employee's replacement.	Retirees may be rehired by the City as follows: • When hired to work on a part-time basis: – Work will be limited to a maximum of 24 hours per week (maximum 48 hours in a pay period) for a duration of no longer than twelve months • When hired on a full-time temporary basis (full-time hours): – Limited to a maximum of one twelve month continuous period of work (e.g. maternity leave backfill) and/or – On an as needs/on call basis to fill short-term work assignments. Each assignment must be for a period of less	Minor revisions for clarity. Revised to increase the maximum period of work to 12 months, as many temporary contracts are for this duration. Clarified that a retiree may only be rehired once for a 12 month continuous period of work. Short-term assignments may only be for six months duration to align with short-term disability coverage.

Current Policy – What Exists Today in Hiring Retired City of Mississauga Employees	***Proposed Policy – If the information in a specific section is unchanged, or has required minimal revision to terminology only, "No change" will appear.***	***Rationale – Why changes (deletions and/or additions) to the revised policy were made.***
Note: Temporary part-time employees working in Recreation and Parks programs employed for less than five hours per week are not subject to a maximum duration for their term of employment.	than six months Note: Temporary part-time employees working in Recreation programs employed for less than five hours per week are not subject to a maximum duration for their term of employment.	Minor revision to remove "and Parks", as the division is now "Recreation" only.
	The following criteria should be considered when rehiring City Retirees: • Urgency to fill position • Unable to find comparable skills, and • Operational pressures require contingency staff	The City promotes the hiring of non-retirees in order to provide opportunities for others to gain experience as a City employee. The additional criteria will assist in making final hiring decisions.
	BENEFIT ENTITLEMENT When retired full-time City of Mississauga employees are hired for a twelve month contract they may be eligible for the Health Spending Account (HSA), consistent with the eligibility requirements. However, an employee cannot qualify for the HSA if they are already enrolled in the City of Mississauga Early Retiree Benefit Plan.	New section to clarify eligibility for the Health Spending Account.
Rehiring of Retired City of Mississauga Employees Guidelines/Administration The Human Resources Division is responsible for		This section has been deleted from the policy and will be replaced by a Standard Operating Procedure for internal HR use

Current Policy – What Exists Today in Hiring Retired City of Mississauga Employees	***Proposed Policy – If the information in a specific section is unchanged, or has required minimal revision to terminology only, "No change" will appear.***	***Rationale – Why changes (deletions and/or additions) to the revised policy were made.***
maintaining the Rehiring of Retired City of Mississauga Employees Guidelines (the "Guidelines"). The Guidelines outline the administration of the Hiring Retired City of Mississauga Employees policy.		only.
Exceptions Exceptions to this policy may be made only with the written approval of the City Manager and the department head, in consultation with the Director of Human Resources, and will be made only in accordance with the OMERS regulation guidelines.	**Exceptions** No change.	

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 2019/06/06	Originator's files:
To: Chair and Members of General Committee	
From: Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer	Meeting date: 2019/06/26

Subject

Single Source Recommendation for Hewlett Packard Enterprise Canada Co. (HPE) for supply of HPE products and related services
File Ref: PRC001676, FA.49.1130-10

Recommendation

1. That the report of the Commissioner of Corporate Services and Chief Financial Officer dated June 6, 2019 and entitled Single Source Recommendation for Hewlett Packard Enterprise Canada Co. (HPE) for supply of HPE product and related services, File Ref: PRC001676, FA.49.1130-10 be received.

2. That Council approve a Single/Sole Source High Value Acquisition between the City and HPE for the supply of server hardware, storage hardware and related services including maintenance and support for the term of five years, ending October 2024, as detailed in the Single Source Recommendation for Hewlett Packard Enterprise Canada Co. (HPE) for the supply of HPE products and related services. File Ref: PRC001676, FA.49.1130-10 Corporate Report, dated June 6, 2019, by the Commissioner of Corporate Services and Chief Financial Officer in accordance with the City's Purchasing By-law 374-06, as amended.

3. That Council approve HPE as a City Standard for a period of five years, in accordance with the City's Purchasing By-law 374-06, as amended.

4. That the Purchasing Agent be authorized to specify Hewlett Packard Enterprise Canada Co. server and storage hardware and related services including maintenance and support in the competitive procurement process leveraging HPE's authorized value added resellers channel.

Report Highlights

- Hewlett Packard Enterprise Canada Co. (HPE) server and storage hardware has been used by the City for many years. The City has standardized on HPE hardware for all server and storage infrastructure.
- In 2010, Council declared HP hardware and software to be a City Standard under procurement number FA.49.1130-10, GC-0654-02010.
- HPE Servers, storage and related hardware have a proven track record of being robust, reliable and scalable.
- IT support staff have a considerable investment and expertise in HPE technologies with servers, storage hardware and related software tools and systems.
- The City IT renewal is critical to sustain business continuity and to safeguard city data. In order to efficiently migrate, maintain maximum system uptime and reduce compatibility issues it is recommended that HPE server and storage hardware be purchased over the next five years to keep the infrastructure current and accommodate new systems and data growth.
- A competitive procurement process was undertaken but was unsuccessful due to the maturity of the market and solutions resulting in no award.
- IT staff have determined that proceeding with lifecycle replacement can be achieved with the current technology providing some enhancements and room for growth while the market and technology matures, at which point we can consider going back out to market.
- Establishing HPE as a City Standard for an additional five years provides the needed time to benefit from a lifecycle replacement, evaluate the market and plan for a broader procurement three years out.

Background

Hewlett Packard Enterprise Canada Co. server and storage hardware has been used by the City for many years. The City has standardized on Hewlett Packard Enterprise hardware for all server and storage infrastructure. The City uses Hewlett Packard Enterprise Server and storage hardware to run all business applications located in multiple data centres. The City has 126 physical servers and six storage arrays. This infrastructure supports over 780 virtual servers, holds all of the City's data and backups and is a platform for over 200 corporate applications. These applications include SAP, SharePoint, Infor, Hastus, KBCity, E-Mail, File Storage, FireCAD, Class and many more.

Over the years, HPE servers, storage and related hardware contained within the City's data centres have a proven track record of being robust, reliable and scalable. There are a number of servers and storage hardware that are end-of-life and are due for replacement. In order to efficiently migrate, maintain maximum system uptime, reduce compatibility issues and maintain

some of the older legacy systems it is recommended that HPE servers and storage hardware be purchased over the next five years to keep the infrastructure current and accommodate new systems and data growth.

Comments

In 2005, after a competitive procurement, Hewlett Packard Canada Co (HP) and the City entered into a five year agreement for the purchase and maintenance and support of storage and server hardware.

In 2010, Council declared HP hardware and software to be a City Standard. Staff became aware that the Province had tendered for HP x86 hardware and subsequently entered into HP x86 Server Agreement No: #OSS-078661. The City adopted the provincial VOR. The original five year contract was extended by the province by one year and was adopted by the City in 2016. The contract ended in July of 2017. In 2017, the City extended Hewlett Packard Enterprise as City Standard for an additional two years under GC-0549-2017. It is recommended that HPE is to be continued to be a City standard for new server and storage hardware purchases and related services including maintenance and support for the period of five years, while further strategic decisions are made for the benefit of the City. Should other platforms be used, the City may be affected, as supporting server and storage hardware from multiple vendors may result in operational and compatibility issues. In addition, IT support staff have a considerable amount of training and expertise with HPE servers, storage hardware and related software tools and systems.

In 2016, Information Technology conducted an RFP process to procure new Hyper Converged Infrastructure (HCI) technology for its next iteration of server and storage hardware, however, there were challenges with vendors not meeting the specific requirements and terms and conditions for the City and as a result they were disqualified. Earlier this year, a decision was made to continue with a business as usual approach and procure a modernized three-tier server architecture to lifecycle existing aging server and storage hardware. Over the next few years, the City will see how HCI technology advances and matures and reconsider it for the next refresh if it meets all of our needs and proves to be a more cost effective solution.

Purchasing By-law Authorization

The recommendation in this report is being made in accordance with Purchasing By-law 374-06, Section 12 (3), (iii) and Schedule A, 1(b) (xi) which states that a single source procurement method may be applied when, “a need exists for compatibility with or for the maintenance and support of a City Standard….”, and 1 (b) (xii) “a need exists to avoid violating warranties and guarantees where support or service is required for a City Standard”.

Information Technology, Material Management and Legal Services staff will collaborate to establish the detailed requirements, negotiate the final arrangements and prepare the requisite forms including the contract agreements.

Financial Impact

Information Technology establishes their Capital requests on an annual basis based on business requests and standard lifecycle replacements, along with the operating budget that reflects yearly maintenance and new purchases of server and storage hardware. All server and storage purchases will be based on approved budget and a competitive procurement process which will ensure that best pricing is obtained on a case by case basis.

Estimated five year projected capital spends:

2019 – 3.2 million using (PN17512, PN18512, PN19512) allocated for lifecycle of primary storage SANs, host servers for virtual machines (VMs), fibre channel storage switches, corporate data backup servers and storage SAN infrastructure.

Future years:

Year	Projected Spends	Comments
2020	1,760,000	Lifecycle of non-virtual physical servers, SSD storage SAN, tape backup libraries, C class blade servers and chassis. Additional servers and storage to accommodate new projects and data growth projected at 20 percent compounded per year.
2021	848,000	
2022	1,200,000	
2023	1,400,000	

*** Years two through five are projections based on growth and standard lifecycle replacements pending annual Information Technology capital budget process and approval.

Conclusion

Hewlett Packard Canada Co. server and storage hardware was previously declared as a City Standard in 2010. This report recommends that Hewlett Packard Enterprise Canada Co. server and storage hardware continues to be the City standard for the period of five years while further strategic decisions are made for the benefit of the City. This report also recommends that the Purchasing Agent be authorized to initiate a competitive procurement process with resellers of Hewlett Packard Enterprise Canada Co. server hardware and storage as well as maintenance and support for the period of five years, ending in October of 2024.

Attachments

Appendix: Hewlett Packard Enterprise Canada Co. – Statement of Work

G. Kent.

Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer

Prepared by: Jeff Rowsell, Sr. IT Manager, Infrastructure Services

Appendix 1

Hewlett Packard Enterprise Canada Co. - Statement of Work

The following list of products and services from Hewlett Packard Enterprise are to be specified in the competitive procurement process through value added resellers for the term of five years:

- Hewlett Packard Enterprise Servers and related equipment
- Hewlett Packard Enterprise Storage and related equipment
- Hewlett Packard Enterprise Storage Fibre Channel equipment
- Hewlett Packard Enterprise iSCSI equipment
- Maintenance and support
- Professional services
- Training

YEAR	HARDWARE LIFECYCLE DETAILS & SERVICES
Year 1 (2019)	• Replacement HPE primary host servers for virtual machines (800k) • Replacement of primary HPE 3PAR spindle drive storage SANs (900K) • Replacement HPE Brocade fibre channel storage switches (350k) • Professional services and training for data and server migration from old HPE 3PAR storage SAN (150k) • Replacement of corporate data backup infrastructure servers and storage SANs (1 million) • Maintenance and support included with hardware purchases
Years 2-5 (2020-2023)	• Replacement of HPE physical servers, C-Class blade servers and chassis and additional new hosts servers for new applications and growth (3.2 million) • Replacement of HPE storage and tape library server (500k) • Additional SAN shelves and spindle hard drive storage for data growth (500k) • Additional SAN shelves and SSD storage for replacement of HPE 3PAR SSD storage SAN (850k) • Additional professional services as required (150K) • Maintenance and support included with hardware purchases

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 2019/06/04	Originator's files:
To: Chair and Members of General Committee	
From: Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer	Meeting date: 2019/06/26

Subject

Single Source Procurement - Replacement of Agenda Management System with eSCRIBE Software, File Ref. PRC001653

Recommendation

1. That the report from the Commissioner of Corporate Services and Chief Financial Officer dated June 4, 2019 and entitled, Single Source Procurement - Replacement of Agenda Management System with eSCRIBE Software, File Ref. PRC001653 be received.

2. That Council approve the Single Source High Value Acquisition between the City and eSCRIBE Software Ltd. for software subscription and professional services to support the City's agenda management requirements for a period of up to ten years, as detailed in the Single Source Procurement - Replacement of Agenda Management System, File Ref. PRC001653 Corporate Report dated June 4, 2019, by the Commissioner of Corporate Services and Chief Financial Officer, in accordance with the City's Purchasing By-law 374-06, as amended (the "Purchase").

3. That the Purchasing Agent or designate is authorized to execute all contracts and related ancillary documents with respect to the Purchase between the City and eSCRIBE Software Ltd., in accordance with the City's Purchasing By-law 374-06, as amended.

4. That Council authorize the Purchasing Agent to issue necessary future amendments with respect to the Purchase to increase the value of the contract between the City and eSCRIBE Software Ltd., in accordance with Section 18(2)(e)(iii) of the City's Purchasing By-law 374-06, as amended, to allow for additional products, professional services, maintenance and support for the purpose of facilitating the successful implementation of eSCRIBE, provided that such amendments are in a form satisfactory to Legal Services and where the amounts have been approved in the budget.

Report Highlights

- The information technology system currently in place to support the City's agenda management area is associated with increasing support issues resulting in downtime and costly rework and administrative effort.
- There is a robust and cost effective product, eSCRIBE, on the market that is utilised in a growing number of Ontario municipalities. This product has a larger set of features and stronger support in place that would reduce risks of service interruptions and ensure administrative effectiveness.
- There will be no financial impact for 2019 since the purchase and implementation was already approved as part of the 2019 Capital Budget. On-going costs from years two to five will be addressed as part of the 2020 budget cycle.
- City staff recommend the single source procurement of the eSCRIBE solution to support the City's agenda management area.

Background

In 2015, the City implemented agenda management software to streamline corporate report approval workflows, extracts of committee decisions and agenda and meeting minute preparation. Since the rollout of this software, there are over 600 users in the City using this program. Implementing this software has increased efficiencies by replacing a paper-based process for reports and agenda preparation. The software improved the appearance of reports and agendas with a more professional look and pagination.

However, feedback from the users is that the software is hard to use, associated with duplicate entries, lost data, downtime and technical delays in getting reports available for appropriate review and submission to decision-makers. There are compatibility issues with the current version of the software with Microsoft Office 2016/365, resulting in delays for a corporate-wide upgrade. In addition, it was anticipated that recorded video from meetings would be integrated in the minutes which have not been implemented due to system deficiencies. A recent update to the software to make it work with Microsoft Office 2016/365 has been made available by the vendor. However, this update has not been implemented in any Ontario municipalities due to continuing technical issues with the product operating in the municipal technical environments.

To ensure that the City continues to streamline the key processes for reports, reduce technical risks with agenda and minutes preparation and ensure that there is compatibility with City technology directions, a new agenda management system is recommended to be implemented. Through the 2019 budget process, staff put forward a budget request to implement an agenda management system, which was approved by Council.

Comments

Replacement of the agenda management system provides the opportunity to implement a system that is compatible with Microsoft Office 2016/365 and future Microsoft upgrades to ensure continued streamlining of the report approval workflow and agenda and minute preparation processes. Additional features to promote more collaboration on reports and use of video integration/streaming of the meetings into the minutes and html formatting of agendas would also be available from a new system.

The proposed vendor is eSCRIBE Software Ltd. The eSCRIBE product is deployed in approximately 60 municipalities in Ontario. A procurement process for the eSCRIBE agenda management system was completed by the following surrounding municipalities: York Region (est. pop. 1.1 million), Niagara Region (est. pop. 448,000), Hamilton (est. 579,000 pop.), Burlington (est. pop. 183, 000) and Newmarket (est. pop. 90, 000). The City can benefit from the competitive procurements that have taken place as these municipalities have already vetted the market. The procurement processes have determined the eSCRIBE product is a cost effective leader in the market.

The replacement of the current agenda management system is time-sensitive as the contract with the current vendor is set to expire on September 30, 2019. The current software is incompatible with Microsoft Office 2016/365, delaying office software upgrade rollout corporate wide and there are pressures to get a new solution that will meet business needs efficiently and effectively.

The proposed vendor offers 'ride along' discount pricing to sister communities that have an agreement with the vendor which will be extended to Mississauga. eSCRIBE is familiar with legislative standards and procedures for Ontario's municipal meetings as well as considerations for data sovereignty and privacy regulations. These solutions are also compliant with accessibility standards. Through discussions with other municipalities, staff have received positive feedback on the software meeting the business needs. In a press release from The Association of Municipalities of Ontario (AMO), it was stated that the AMO has partnered with eSCRIBE and the solution is their preferred provider of "cloud-based, paperless meeting management and livestreaming software".

Purchasing By-law Requirements

The recommendations in this report are being made in accordance with Schedule A of the Purchasing By-law #374-06, Section 1 (b) (vii) wherein it states that "It is advantageous to the City to acquire the Goods and/or Services from a supplier pursuant to the procurement process conducted by another Public Body" and Section 18 (2) (e) (iii) of the Purchasing By-law #374-06, wherein it states that "Council has provided direction otherwise on the procurement at issue".

Legislative Services, Information Technology, Legal Services and Materiel Management staff will collaborate to establish the detailed requirements, negotiate the final arrangements and prepare the requisite forms including contract agreements.

Financial Impact

This item has no financial impact for 2019. Through the 2019 budget process, budget request #5449 – Agenda Management Upgrade was approved by Council to include $590,000 for capital funds related to implementation of software and labour in 2019 and 2020. This included $304,400 in 2019 and $285,400 in 2020.

Sufficient funding is available in capital project 19641 ($304,400) to complete the implementation of the software.

The annual operating cost is currently approved at $8,000 per year. The new operating costs for eSCRIBE are proposed as $71, 213 (these costs include all operational, transaction and other database costs) per year starting in 2020. The balance of future year funding requirements of $63,213 will be included in the 2020 Business Plan and Budget and will be subject to budget approval.

Conclusion

An offer that represents good value has been received from eSCRIBE for configuration, implementation, provisioning, maintenance and support for a five-year term. This report recommends the award to eSCRIBE Software Ltd. on a single source basis and for the Purchasing Agent to issue contract amendments to increase the value of the contract in accordance with the Purchasing By-law #374-06.

Attachments

Appendix 1: eSCRIBE Software Ltd - Statement of Work

G. Kent.

Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer

Prepared by: Paul Burns, Manager IT - Portfolio & Development, CMO/CPS

eSCRIBE Software Ltd. - Statement of Work

eSCRIBE is proposed to be contracted to provide products, ongoing maintenance and professional services to support the City's agenda management function.

The following products and services from eSCRIBE are proposed to be purchased directly:

The Product

The eSCRIBE Transparency Bundle includes technology modules to support Meeting Management; Participant Access; Report Management; Internet Publishing and Webcasting.

The product includes enterprise licences for access to the system and related modules that enable meeting logistics, agenda management, minutes, action logs and publishing and archiving and video streaming.

Ongoing Maintenance

The contract will include ongoing maintenance of the eSCRIBE software used by the City of Mississauga to prepare agenda creation, approval and distribution; procedures, minute editing and task distribution, web layout management and scheduling future meetings.

The vendor, eSCRIBE, will cover the required hours and provides both live answer and email support, trouble ticket tracking, FAQ's and available after-hours support when required. There are no limits on the number of users, meetings, meeting types, storage or any user or activity based action on the system.

Professional Services:

Professional services from the eSCRIBE vendor will include resources required to identify and adapt to internal processes, configure the templates and set-up the solution to the City's structure and organization. Professional services will also be used for project management services during the implementation, align and test the solution, deploy into continued operation.

The total five year procurement cost is estimated to be $365,785 and this includes:

One-time Implementation Fees	$ 34,860
Year 1 Fees	$ 94,073
Annual Fees - Year 2 to 5 ($59,213 x 4)	$ 236,852
Total	**$ 365,785**

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 2019/06/04	Originator's files:
To: Chair and Members of General Committee	
From: Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer	Meeting date: 2019/06/26

Subject

Single Source Recommendation for Bentley Systems Incorporated PRC001689, Contract Renewal

Recommendation

1. That the report from the Commissioner of Corporate Services and Chief Financial Officer dated June 4, 2019 entitled Single Source Recommendation for Bentley Systems Incorporated PRC001689, Contract Renewal be received.

2. That Bentley Systems Incorporated be designated as the single source vendor for five years for the supply and delivery of software and related support and maintenance services in support of (i) CAD construction design and review work and (ii) legal document management functionality to comply with the requirements of the Construction Act, as outlined in the report from the Commissioner of Corporate Services and Chief Financial Officer dated June 4, 2019 and entitled "Single Source Recommendations for Bentley Systems Incorporated PRC001689, Contract Renewal", in accordance with the City's Purchasing By-law 374-06, as amended.

3. That the Purchasing Agent or designate is authorized to execute all contracts and related ancillary documents with respect to the Purchase between the City and Bentley Systems Incorporate, in accordance with the City's Purchasing By-law 374-06, as amended at an estimated cost of $368,000 before taxes for the first year, and an estimated cost of $2,100,000 for the next four years.

4. That Council continue to approve the Bentley Systems Incorporated software identified herein as a City Standard for a period of five years, ending August 2024, in accordance with the City's Purchasing By-law 374-06, as amended.

Report Highlights

- The transition to ESRI for GIS analysis and maintenance is ongoing and during that period, we will need to support current business processes and applications. Additionally, Bentley's CAD software will continue to be used for construction design and review work, an area where ESRI does not have an equivalent product.
- An expansion of the use of Bentley's ProjectWise document management software will facilitate the provision of documents to Legal to meet the reduced timelines required for the adjudication process as required by the Construction Act.
- Bentley is included in the list of City Standard IT Systems. Bentley maintenance and support have been kept current to meet the objectives of the business. There is an opportunity to renew and put in place contracts to sustain business operations and negotiate fixed cost increases for future cost avoidance.

Background

Since the early 1990's, City staff have used products supplied by Bentley Systems Incorporated (Bentley) to maintain the City's digital mapping fabric and geospatial data that are used for analysis of property, zoning, park and road maintenance. The Notification Mailing List custom web application which notifies residents of applications, projects, initiatives and events occurring in their neighbourhoods uses the City's Bentley web map server, digital mapping fabric and geospatial data.

As we follow the Geospatial Master Plan recommendations and transition to ESRI for GIS analysis and maintenance, we will need to maintain the current environment during that change. City staff use Bentley products for analysis and to create the digital mapping layers (property boundaries, roads, park outlines, ward maps, sidewalks and buildings) currently required by many City programs and applications: coordinating road work with utilities and the Region of Peel, visualize the impact of the road rehabilitation capital plan on the City's road network, Planning and Building programs, Engineering and Capital Works programs, online services (Mississauga Maps/iMaps, the Storm Water Charge estimating tool, ePlanning and Building services) and the mobile Forestry application for tree planting. Once the migration is complete, Bentley CAD software will still be required for construction design and plan review.

As an outcome of the Construction Act change project, Bentley's ProjectWise document management software will expand its scope beyond Facility Maintenance Engineering to include all sections responsible for construction, Parks Development, Works Maintenance, Capital Works Delivery and Capital Design and Construction. ProjectWise will facilitate the provision of documents to Legal Services to meet the reduced timelines required for the adjudication process.

Bentley is included in the list of City Standard IT Systems and maintenance and support have been kept current to meet the objectives of the business. There is an opportunity to renew and

put in place contracts to sustain business operations and negotiate fixed cost increases for future cost avoidance.

Comments

The City is currently transitioning our GIS software and servers to an ESRI environment. Staff has estimated two years to replace the Bentley products being used for GIS and field mobility applications. With the change in software ongoing, a shorter-term agreement will allow the City to take advantage of reduced counts of GIS software in the next year. The initial reductions in Bentley GIS software over the second half of 2019 and 2020 will generate enough maintenance savings that signing a multi-year pricing schedule this year will not be in the City's best interest. While there will be an increase in costs associated to ProjectWise and the construction act project, this should be offset by a reduction in GIS software.

Bentley CAD software at 50 licenses needs to be maintained to support Infrastructure Planning & Engineering, Traffic Management & Municipal Parking, MiWay in T&W; Development & Design in P&B; Building Services & Operations, Capital Design & Construction, Asset Management & Accessibility and Facilities Maintenance in F&PM; Business Planning Services, Park Planning and MFES in Community Services. The use of ProjectWise software (150 licenses) is required to support the changes to the Construction Act. It is anticipated that this could result in a cost avoidance of $350,000 over the next five years and reduce overall Bentley contract costs.

The previous three year Bentley contract allowed the City to use all of the products in the Enterprise License Subscription without any change to the negotiated maintenance costs during the three year term. As a result, the City has realized an estimated cost avoidance of $300,000 over the past three years. With the renewal of the contract, the maintenance and support cost must now include all products used by the City, and increased usage for those products and has resulted in an annual cost increase of $58,000. Through the implementation of Connect client software and Enterprise agreement discount, the annual cost increase was reduced by 19.5% resulting in a reduction of maintenance by $24,000 in the operating budget for 2019.

Purchasing By-law Authorization

The recommendation in this report is made in accordance with Schedule A of the Purchasing By-law #374-06, items 1(b)(xi) which states that a single source procurement method may be applied when, "a need exists for compatibility with, or for the maintenance and support of a City Standard and there are no reasonable alternatives, substitutes, or accommodations"; and (a)(iii), wherein it states that "the Goods and/or Services are only available from one supplier by reason of; the existence of exclusive rights such as patent, copyright or license".

Information Technology, Legal Services and Materiel Management staff are collaborating to establish the detailed requirements, negotiate the final arrangements and prepare the requisite forms including the contract agreements

Financial Impact

The City's expenditure for the 2019 Bentley Subscription for maintenance and support requirements is $368,000 before taxes. A price reduction of approximately $82,000 will occur with an implementation of the Bentley Connection client and the associated Enterprise Agreement Deduction. The estimated expenditure for the 2021 to 2024 Bentley Subscription for maintenance and support requirements is $1,750,000 with additional contingency funds. With the change in GIS software ongoing over the next two years, we will see a reduction in software for GIS use during our transition to ESRI. An increase in ProjectWise use for the Construction Act compliance will offset that somewhat. As well, CAD software for design and construction will remain the same.

There is no financial impact to the City of Mississauga as the Bentley Subscription for maintenance and support requirements of $340,000 is already included as part of the 2019 operating budget (715516-21989). The estimated expenditures for 2020 to 2024 will be addressed as part of the current and on-going budget cycle.

Conclusion

An offer representing good value has been received from Bentley Systems Incorporated for maintenance and support for a one year term. This report recommends the award to Bentley Systems Incorporated on a single source basis.

Attachments

Appendix: Bentley Systems Incorporated - Summary Statement of Work

G. Kent.

Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer

Prepared by: Simon Langham, Project Manager, CPS/Web Mapping & GIS platforms

Appendix 1

Bentley Systems Incorporated - Summary Statement of Work

1. Bentley Systems Inc. – Enterprise License Subscription (ELS) for ongoing maintenance, support and training. ***Funded from Operating 715516-21989***	
a. Bentley ELS (Fixed): 2019/09/01 – 2020/08/31	$ 367,103
b. Bentley ELS (Estimated Usage): 2020/09/01 – 2021/08/31	$ 346,677
c. Bentley ELS (Estimated Usage): 2021/09/01 – 2022/08/31	$ 318,082
d. Bentley ELS (Estimated Usage): 2022/09/01 – 2023/08/31	$ 334,220
e. Bentley ELS (Estimated Usage): 2023/09/01 – 2024/08/31	$ 351,175
f. Contingency	$ 32,743
Total	$ 1,750,000

Yearly Estimated Usage based on reductions in software for GIS use during our transition to ESRI, an increase for Construction Act usage and CAD software remaining the same.

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 2019/06/07	Originator's files:
To: Chair and Members of General Committee	
From: Gary Kent, CPA, CGA, ICD.D Commissioner of Corporate Services and Chief Financial Officer	Meeting date: 2019/06/26

Subject
SAP S4 HANA Upgrade

Recommendation
1. That the report from the Commissioner of Corporate Services and Chief Financial Officer dated June 7, 2019 entitled SAP S4 HANA Upgrade be received.

2. That Council approve a Single/Sole Source High Value Acquisition between the City and SAP Canada Inc. for professional services to implement the SAP S4 HANA upgrade project, as detailed in the SAP S4 HANA Upgrade Corporate Report, dated June 7, 2019, by the Commissioner of Corporate Services and Chief Financial Officer, in accordance with the City's Purchasing By-law 374-06, as amended.

3. That the Purchasing Agent be authorized to execute contract amendments and all ancillary documents to increase the value of the contract with SAP Canada Inc., from the original amount of $1,000,000 to the amount of $3,163,094 exclusive of taxes, for professional services to implement the SAP S4 HANA upgrade project.

4. That Council direct the Purchasing Agent to issue contract amendments to increase the value of the contract, in accordance with section 18(2)(e)(iii) of the City's Purchasing By-law 374-06, as amended, to allow for additional professional services as identified by City staff as necessary and/or required to facilitate the successful implementation of the SAP S4 HANA upgrade project, provided that such amendments are in a form satisfactory to Legal Services and where the amounts have been approved in the budget.

5. That the 2019 complement for Enterprise Business Solutions be increased by 11 contract FTEs, funded through Capital Budget, to implement the SAP Roadmap initiatives for a revised complement of 34.

Report Highlights

- Council approved the Single Source Recommendation for SAP Canada Inc. (GC-0014-2016) that described the City's five year SAP Roadmap and authorized the Purchasing Agent to execute the contract and all related ancillary documents, on a single source basis for products, professional services and maintenance and support.
- The City signed a ten year contract with SAP Canada Inc. to continue a long term partnership, and established the licensing model, maintenance support and professional services agreements. SAP Canada Inc. continues to be designated as a City Standard for the ten year period (January 2016 to December 2025).
- The SAP S4 HANA upgrade, which is SAP's latest Enterprise Resource Planning (ERP) release, provides many new features and innovations and was identified in the original SAP Roadmap. By 2025 all SAP customers must upgrade to S4 HANA to maintain support and stay current. At a minimum, the City will need to upgrade to the latest infrastructure or upgrade to S4 HANA to keep a stable and supportable system. Staff determined that the risk of delaying the start of the upgrade to 2020 will result in an estimated additional cost of $1,332,125.
- SAP Canada Inc. has conducted an assessment of the effort required for the upgrade and submitted a professional services proposal for the amount of $3,163,094. This report requests authority for the Purchasing Agent to issue contract amendments and all ancillary documents to increase the value of the contract with SAP Canada Inc. by $2,163,094.
- Total funding required to complete the SAP S/4 HANA Upgrade project is estimated to be $9,500,000, which includes licensing, infrastructure, hardware, professional services and staff resources required for the implementation.
- Multi-year funded capital projects were approved with a total funding amount of $4,630,000 in the existing 2019 - 2028 Capital Budget forecast requiring an additional amount of $4,870,000 in 2020 to fund the revised SAP S4 HANA project which will be requested through the 2020 Business Plan and Budget process.
- Throughout the planning process staff identified that an additional 11 dedicated City resources are required to complete the upgrade. Approval to increase the 2019 complement for Enterprise Business Solutions by 11 contract FTEs funded though Capital budget is requested.

Background

SAP is the City's vendor of record for Enterprise Resource Planning (ERP) for the City's financials, accounting, accounts receivables, accounts payables, purchasing, revenue management, financial reporting, payroll and human capital management.
Through benchmarking, staff has established that the SAP ERP system is a best practice in the public service for large and mid-size public sector organizations. Since its inception 47 years

ago, SAP Canada Inc. has grown to serve more than 293,000 customers in 190 countries and has become a world leader in enterprise applications. In addition to the City of Mississauga, other Canadian municipalities using SAP include: City of Toronto, City of Ottawa, City of Kitchener, City of Barrie, City of Thunder Bay, City of Cambridge, Town of Richmond Hill, Halton Region, City of Vancouver, City of Edmonton, City of Nanaimo, City of Burnaby and City of Abbotsford.

The City established a relationship with SAP Canada Inc. to grow its use of SAP introducing new features and efficiencies for a rapidly growing corporation with a significant workforce and financial responsibility. Today, the City uses SAP solutions for HR and Finance functions including managing close to a billion dollars in revenue and half a billion dollars in expenditures annually; as well as processing payroll and HR transactions for over 7,800 staff.

The City's five year SAP Roadmap contains a series of opportunities that align with the needs of the Corporation to effectively manage its Financial and Human Capital requirements through the implementation of SAP solutions.

In January 20, 2016, Council approved the Single Source Recommendation for SAP Canada Inc. (GC-0014-2016) that described the City's five year SAP Roadmap and authorized the Purchasing Agent to execute the contract and all related ancillary documents, on a single source basis for products, professional services and maintenance and support.

In December 23, 2016, the City signed a ten year contract with SAP Canada Inc. to continue a long term partnership, and established the licensing model, maintenance support and professional services agreements. SAP Canada Inc. continues to be designated as a City Standard for the ten year period (January 2016 to December 2025).

Comments

The City's SAP ERP system is the backbone for financial and human capital information and has been essential to running the City's business for over 24 years. The SAP solutions have digitally transformed the City's Human Resource and Finance processes, introduced new compliance controls, integration to key City systems and provides full access to all employees anywhere, anytime and on any device.

S4 HANA is the latest SAP ERP release and was identified as one of the initiatives in the City's five year SAP Roadmap. SAP is investing all new features and innovations in the S4 HANA release and in order to use these new innovations, clients must be operating on the S4 HANA release. By 2025, all SAP customers must upgrade to S4 HANA to maintain support and stay current. The City's current SAP environment is on de-supported infrastructure. At a minimum, the City will need to upgrade to the latest infrastructure or upgrade to S4 HANA to keep a stable and supportable system.

In December 2018, SAP completed a six month assessment to determine the effort and investment required to complete the upgrade. Subsequently, SAP submitted a professional services proposal for the upgrade indicating a one year implementation timeline for a quoted price of $3,163,094. The quoted price is valid provided the City signs the contract by July 31, 2019 and the project commences in Q4 of 2019. After August 1, 2019, the price will increase by 10.5% to $3,495,219.

Staff has determined that the risk of delaying the start of the upgrade to 2020 will result in an estimated additional cost $1,332,125:

- $332,125 increase for SAP professional services
- $500,000 increase to pay for a SAP S4 HANA Customer Care program
- $500,000 to replace the current de-supported infrastructure as an interim step

Through the assessment and planning, staff identified additional Infrastructure costs, additional licensing from growth and a complete SAP module replacement for Incident and Claims Management.

The scale and complexity of this project is the largest ERP project ever undertaken at the City. The process requires a complete remapping of all data and all business processes to the new SAP HANA platform. It requires six full SAP Production migration cycles which is designed to address the large scale changes in the early cycles followed by smaller and refined changes in each cycle. The SAP System has many automated interfaces to other critical systems in the City that must be modified and maintained throughout the process.

During this major upgrade all Finance and Human Resource processes must continue to operate and function so that the City can manage and account for a significant portfolio of services. The staff that manage and support the current SAP environment will not have the capacity to carry out this project. The SAP HANA assessment process also identifies the required resources and skills needed to manage the significant changes in each of the six cycles of the data and process migration. Through the planning process staff identified that an additional 11 dedicated City resources are required to complete the upgrade. Many of the processes within the SAP have audit compliance requirements which require the level of due diligence and resource for a project of this size and complexity.

The S4 HANA upgrade is the most complex upgrade since SAP's inception given the substantial design changes included to accommodate new innovations. As such, the upgrade will require significant investment, effort and expertise to transform and modernize our critical ERP system and allow the City to sustain, move forward and take advantage of new innovations.

Purchasing By-law Authorization
The recommendations provided for in this report are made in accordance with Section 1(b)(iv) of the Purchasing By-law #374-06, wherein is states that Acquisitions may be conducted using a Single/Sole Source supplier where "The solicitation of competitive Bids would not be economical to the City"; Section 18 (2) (d) of the Purchasing By-law #374-06, wherein it states that "For amendments to High Value Acquisition Commitments, Council approval is required if the amendment is of a value that, on its own or if added together with any and all previous amendments made to the Original Commitment, the cumulative value of all amendments are greater than 20% of the Original Commitment and greater than $100,000; or over $1,000,000"; and Section 18 (2) (e) (iii) of the Purchasing By-law #374-06, wherein it states that "Council has provided direction otherwise on the procurement at issue".

Information Technology, Materiel Management and Legal Services staff will collaborate to establish the detailed requirements, negotiate the final arrangements and prepare the requisite forms including the contract amendment agreements.

Financial Impact

An estimated total funding of $9,500,000 for licensing, infrastructure, hardware, professional services, and staff resources is required to complete the S4 HANA upgrade project. Multi-year funded capital projects were approved with a total funding amount of $4,630,000 in the existing 2019 – 2028 Capital Budget forecast requiring an additional amount of $4,870,000 in 2020 to fund the revised SAP S4 HANA project which will be requested through the 2020 Business Plan and Budget.

It is estimated that operating budget increases for subscription and maintenance and support costs of approximately $85,000 would start in 2021.

A project team comprised of 11 contract FTEs funded through Capital Budget are required for the S4 HANA upgrade with a complete project resourcing plan found in Appendix 2.

A financial impact of $1,332,125 in additional costs has been identified should the project be delayed to 2020.

Conclusion

The City has used SAP since 1995 and SAP Canada Inc. is the City's vendor of record for Enterprise Resource Planning for HR and Finance functions.

A SAP Roadmap was developed to define the SAP solutions required to sustain the City's growth, improve efficiencies, ensure legislative and audit compliance identified in the Finance Technology Plan and to deliver on the action plans identified in the People Strategy to implement Talent Management.

One of the key initiatives of the SAP Roadmap is the S4 HANA upgrade which is a major undertaking introducing many innovations that will drive decision support, better processes and better controls for compliance.

This report recommends that Council approve the Single/Sole Source to SAP Canada Inc. for professional services necessary to implement the SAP S4 HANA upgrade project and an increase in contract value with SAP Canada Inc. by $2,163,094. Furthermore, this report recommends that Council direct the Purchasing Agent to issue contract amendments to increase the value of the contract provided that such amendments are identified by City staff as necessary and/or required, in a form satisfactory to Legal Services and where the amounts have been approved in the budget. Finally, this report recommends that Council approve the staff complement increase for Enterprise Business Solutions by 11 contract FTEs.

Attachments

Appendix 1: SAP S4 HANA - Statement of Work
Appendix 2: SAP S4 HANA - Project Resourcing Plan

G. Kent.

Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer

Prepared by: Helen Chin-Donofrio, Senior Manager, Enterprise Business Solutions

Appendix 1

SAP S4 HANA – Statement of Work

SAP Canada Inc. will provide the following services as part of the SAP S4 HANA upgrade initiative:

- Upgrade the City's SAP ERP environments to S4 HANA.
- Provide Project Management services throughout the project.
- Provide the S/4HANA Customer Care Program by offering:
    - A named Management Sponsor from the SAP development team.
    - A named Project Coach serving as a remote contact to share best practices and collect feedback.
    - A named Development Angel facilitating the access to the SAP S/4HANA Development organization.
- Conduct a SAP Enterprise Structure Assessment to assess City of Mississauga's Finance and Materiel Management Logistics SAP Enterprise Structure and make sure that City is ready to leverage innovation benefits from the S/4HANA platform.
- Provide 6 weeks post go live support program.
- Manual S/4 HANA Finance data conversion where the data from old tables is transferred to the new data models. SAP will execute the following activities:
    - Necessary preparation in the relevant application areas (General Ledger, Asset Accounting, CO-PA, Materiel Ledger, House Bank accounts, Cash Management and Trade Finance) to ensure data that is cleaned is moved to the new data models.
    - Settings of post data migration activities.
    - Reconciliation data post data transfer.
    - Setup new General Ledger migration.
    - New Asset accounting set up and configuration to accept data from legacy systems.
    - Financial Credit Management set up.
    - Activation of Material Ledger.
    - New Cash management (Basic one) set up and configuration.
    - Cost Allocation setup and configuration.
    - Cash Application & AP Workflow Approval setup and configuration.
    - Bank Master Data & interface setup and configuration.
    - Universal Journal setup and configuration.
    - Setup centralized bank account management, with which business users can manage bank accounts as master data with more business attributes (BASIC).
    - Enable 50 Fiori applications.
    - Remediation of existing Fiori applications and personas.

- S/4 HANA Technical Architecture planning and design:
  - Assist in providing hardware sizing requirements and architecture for S/4 HANA and FIORI systems with High Availability and Disaster Recovery.
  - Assist in advising Licensee on which Add-on(s) ("Add-ons") are supported/not supported/ need to be uninstalled/upgraded as a part of conversion.
  - Ensuring interoperability of other SAP systems with S/4 HANA system.
- Lead the creation of and prepare the Cookbook ("Detailed Runbook") covering all the steps of technical upgrade execution along with issues faced and their solution.
- Rebuild the Employee Self-Serve and Manager Self-Serve custom code remediation.
- Remediate 27 SAP/Non-SAP interfaces and depreciated transaction codes and Business Warehouse extractors.

SAP Deliverables:

SAP will provide the following deliverables as part of this statement of work:

- Enterprise Structure Assessment report.
- Conversion of SAP ECC 6 Ehp6 to S/4HANA 1809 and HCM/Payroll modules running on compatibility pack.
- Mitigation of the existing ECC 6 Ehp6 configuration to adapt S/4HANA simplifications, including the following specific adaptations:
  - Remediation of BW Extractors.
  - Remediation of ABAP code.
  - Remediation of existing Fiori Apps and Personas.
  - Rebuild ESS/MSS applications.
  - Remediate 27 SAP/Non-SAP Interfaces to work on the new S4 HANA release.
- SAP S/4HANA Technical architecture and hardware sizing.
- Activated standard 50 Fiori Apps.
- Detailed runbook covering all the steps of technical upgrade execution along with issues faced and their solution.
- Provide 6 weeks post go live support program.

Appendix 2

SAP S4 HANA - Project Resourcing Plan

The SAP S4 HANA upgrade is the largest technology project the City has undertaken and involves the complete rebuild of the system that is the core of the City Financial and Human Capital functions. A dedicated Project Team is required to address the significant workload and also to address the compliance and risk requirements to support financial and audit controls.

A dedicated Project Team of 11 FTEs is a combination of eight (8) Information Technology (IT) staff and three (3) Finance (FIN) staff as outlined in the table below. They will be responsible for project management, data and business process changes and testing for existing functionality. With the S4 Hana system, new functionality and improvements are also being implemented including 50 new mobile Fiori apps, a Cost Allocation module, Asset Accounting, Bank Master, Accounts Payable Workflow and a new Incident and Claims Management solution to replace a legacy system. The team will be performing the full implementation lifecycle, business requirements analysis, system design, build, functional and compliance testing, implementation and post go live support for critical functions including payroll, financial transactions, procurement and contract management and human resource functions.

	Position
IT	SAP Manager
IT	Project Manager
IT	Project Leader
IT	Application Developer
IT	Finance System Specialist
IT	Materiel Management System Specialist
IT	Human Capital Management System Specialist
IT	Payroll System Specialist
FIN	Finance Business Lead
FIN	AP & Accounting Business Lead
FIN	Financial System Support

The Project Team will be required for 18 months starting September 2019 through to December 2020. The team will be comprised of existing City staff who would be backfilled to be dedicated to the project as well as some external candidates who would have specific skills needed for this project.

These positions will be funded from the Project Capital budget.

City of Mississauga
Corporate Report

MISSISSAUGA

Date: 2019/06/11	Originator's files:
To: Chair and Members of General Committee	
From: Gary Kent, CPA, CGA, ICD.D Commissioner of Corporate Services and Chief Financial Officer	Meeting date: 2019/06/26

Subject
Annual Treasurer's Statement Report: Summary of Activity in 2018

Recommendation
1. That the report dated June 11, 2018, entitled "Annual Treasurer's Statement Report: Summary of Activity in 2018" from the Commissioner of Corporate Services and Chief Financial Officer, required by the *Development Charges Act, 1997* and *Planning Act*, be received for information.

2. That Council endorse that the "Annual Treasurer's Statement Report: Summary of Activity in 2018" complies with the reporting requirements of the *Development Charges Act, 1997* and the *Planning Act*.

3. That the City of Mississauga's "Annual Treasurer's Statement Report: Summary of Activity in 2018" be made available to the public on the City of Mississauga's website.

Report Highlights
- Legislative requirements in the *Development Charges Act* (DC Act) and the *Planning Act* require the Treasurer of the municipality to provide Council with a financial statement each year for the Development Charges (DC), Bonus Density (Section 37) and the Cash-in-Lieu of Parkland (CIL) reserve funds and a listing of DC/Lot levy credits.
- The Treasurer's Annual Statement summarizes the financial activities related to these reserve funds and DC/Lot levy credits for the 2018 fiscal year.
- The DC reserve fund opening balance for 2018 was $40.1 million. The City collected $61.7 million in DC revenue and funded $15.6 million in capital projects for growth-related capital assets. The closing balance was $87.9 million at the end of 2018.
- The City collected $23.3 million in CIL-Parkland revenue during 2018 and funded capital assets of $6.3 million in 2018. The closing balance of the CIL-Parkland reserve fund after all transactions was $104.0 million.
- The Bonus Density (Section 37) reserve fund had an opening balance of $1.5 million in

2018, received $1.3 million through Section 37 agreements during the year and funded capital assets of $0.7 million in 2018. The closing balance at the end of 2018 was $2.2 million.

- This report is compliant with both the *DC Act* and the *Planning Act*.

Background

The *Development Charges Act, 1997* (*DC Act)* section 43(1), (2) and the *Planning Act* section 37(7), (8) and section 42(17), (18) require the Treasurer of the municipality to provide Council with an annual financial statement for activities related to its DC, Bonus Density (Section 37) and Cash-in-Lieu of Parkland Reserve Funds and DC/Lot Levy credits.

Comments

This report has been prepared to comply with the legislative requirements in the *DC Act* and the *Planning Act*. A summary of reserve fund activities during 2017 and 2018 is contained within the body of this report for Council's information. The report appendices have been prepared to comply with the reporting requirements as contained in each of the Acts.

The Statement of Compliance found in Appendix 6 is a legislative requirement that came into effect on January 1, 2016. This statement requires the municipal Treasurer to indicate that no additional levies have been collected by the City beyond those allowed under existing legislative acts.

Development Charges (DC) Reserve Fund Activity

Table 1 summarizes DC Reserve Fund activity. A significant amount of development occurred during 2018. DC revenue of $61.7 million was received in 2018. This is $25.7 million more than the $36 million collected in 2017. Interest earned is $0.7 million more in 2018 than in 2017, due to the higher balance in 2018.

The allocation of DC revenue to growth-related capital projects in 2018 was $28.4 million, a decrease of $21.7 million from the 2017 DC allocations to capital projects. About 60% of the $28.4 million was for road and road-related infrastructure projects and 28% was for recreation and park development projects.

Table 1

DC Reserve Fund Activity		2018 $(millions)	2017 $(millions)	Difference
Opening Balance		**$40.1**	**$42.9**	**-$2.8**
Add:	DC Revenues	$61.7	$36.0	$25.7
	Interest Income and Other	$1.8	$1.1	$0.7
	Total Revenues	**$63.5**	**$37.0**	**$26.5**
Less:	DC Funds Transferred to Capital Projects	$28.4	$50.1	-$21.7
	DC Funds Returned from Capital Projects	-$12.8	-$10.9	-$1.9
	Transfers to Revenue and Refunds	$0.2	$0.6	-$0.4
	Total Expenditures	**$15.8**	**$39.8**	**-$24.0**
Closing Balance		**$87.9**	**$40.1**	**$47.8**

A list of all DC Reserve Funds, including descriptions, can be found in Appendix 1, and 2018 activity for each DC Reserve Fund can be found in Appendix 2.

CIL-Parkland Reserve Fund Activity

As summarized in Table 2, the collection of CIL-Parkland revenues in 2018 increased by $15.7 million from 2017. Total capital expenditures for eligible expenses such as land acquisition, building renovation and equipment repair and replacement was $8.1 million in 2018 ($3.1M less than in 2017). With additional interest, the closing fund balance shows an increase of $33.0 million in 2018.

Table 2

CIL-Parkland Reserve Fund Activity		2018 $(millions)	2017 $(millions)	Difference
Opening Balance		**$71.0**	**$65.8**	**$5.2**
Add:	CIL-Parkland Revenues	$23.3	$7.6	$15.7
	Interest Income and Other	$16.0	$3.2	$12.8
	Total Revenues	**$39.3**	**$10.8**	**$28.5**
Less:	CIL-Parkland Funds Transferred to Capital Projects	$8.1	$11.2	-$3.1
	CIL-Parkland Funds Returned from Capital Projects	-$1.8	-$5.8	$4.0
	Transfers to Revenue and Refunds	$0.0	$0.2	-$0.2
	Total Expenditures	**$6.3**	**$5.6**	**$0.7**
Closing Balance		**$104.0**	**$71.0**	**$33.0**

A list of all capital projects financed by DC and Cash-in-Lieu of Parklands can be found in Appendix 3.

Bonus Density (Section 37) Reserve Fund Activity

The Bonus Density reserve fund was established with the approval of the 2012 Corporate Policy governing the collection of monies related to Section 37 of the Planning Act. The City has collected $1.3 million in community benefit contributions from development during 2018. A small allocation of $0.7 million for capital expenditures had been made from this reserve fund in 2018.

Table 3

Bonus Zoning Reserve Fund Activity	2018 $(millions)	2017 $(millions)	Difference
Opening Balance	**$1.6**	**$1.2**	**$0.4**
Add: Bonus Zoning Revenue	$1.3	$0.3	$1.0
Interest Income and Other	$0.1	$0.1	$0.0
Total Revenues	**$1.4**	**$0.4**	**$1.0**
Less: Bonus Zoning Funds Transferred to Capital Projects	$0.7	$0.0	$0.7
Bonus Zoning Funds Returned from Capital Projects	$0.0	$0.0	$0.0
Total Expenditures	**$0.7**	**$0.0**	**$0.7**
Closing Balance	**$2.2**	**$1.6**	**$0.6**

DC/Lot Levy Credit Activity

The majority of Lot Levy credits are related to the road and storm services which were waived during the lot levy regime in development agreements. These credits are redeemed when a building permit is issued. The value of each credit is calculated and this amount is transferred from the lot levy reserve funds to the development charge reserve funds to keep DC revenues whole. Appendix 4 summarizes the amount of lot levies held by the City. No credits were redeemed in 2018.

Developers are also entitled to DC credits if they construct infrastructure on behalf of the City. Appendix 5 indicates there was no DC credit activity during 2018.

Financial Impact

There are no immediate financial impacts as a result of the recommendations in this report.

Conclusion

The Annual Treasurer's Statement is required by the *Development Charges Act, 1997* and the *Planning Act*. This report and its accompanying appendices have been prepared for Council's information and to fulfill the legislative and regulatory reporting requirements of the Annual Treasurer's Statement. This statement will be made available to the public on the City's website following Council's approval of the recommendations.

Attachments

Appendix 1: 2018 DC Reserve Funds Description
Appendix 2: 2018 DC Reserve Funds Continuity Schedule
Appendix 3: 2018 Capital Projects Financed
Appendix 4: 2018 Devt Levy Credits Continuity Schedule
Appendix 5: 2018 DC Credits Continuity Schedule
Appendix 6: 2018 Statement of Compliance

Gary Kent, CPA, CGA, ICD.D, Commissioner of Corporate Services and Chief Financial Officer

Prepared by: Elizabeth McGee, Manager, Financial Strategies

Appendix 1

Development Charge Reserve Funds

Pursuant to the *Development Charges Act, 1997* S.O. 1997 c.27, as amended, monies collected under the act shall be placed into a separate reserve account for the purpose of funding growth related net capital costs for which the development charge was imposed under the Development Charges By-law 0161-2014 or previous Mississauga Development Charge By-laws.

Reserve funds were established for the following purpose:

City-Wide Engineering	Funds are collected for constructing the transportation infrastructure in the City as it relates to development growth. This is not a discounted service, and is collected from both the residential and non-residential development sectors.
Fire	Funds are collected for the capital construction requirements consistent with the Station Location Study as it relates to growth. This is not a discounted service, per the legislation.
General Government	Funds are collected for the purpose of the animal control expansion as a result of residential growth and for the development charges planning studies. This service requires a 10% discount, as per the legislation
Library	Funds are collected for the capital expenses related to growth as outlined in the Library Services Master Plan, which was endorsed by both Council and the Library Board. All funds collected are as a result of residential growth and is a discounted service per the legislation.
Living Art Centre Debt	Funds collected for this service are used to retire a debt incurred for the construction of the Living Arts Centre in Mississauga. Development charges are collected from the residential sector only and a 10% discount has been applied to the debt outstanding.
Parking Services	Funds collected for these services are to be used for the design and construction of parking services in the City of Mississauga. This service requires a 10% discount, as per the legislation.
Public Works	Funds are collected for the capital costs involved with Building and Fleet components of the Public Works Division of Transportation and Works Department as it relates to growth. This charge is collected from both the residential and non-residential sectors, and is discounted by 10%, as per the legislation.
Recreation	Funds are collected for the purpose of capital requirements consistent with the Future Directions Plan servicing residential growth. This service requires a 10% discount, as per the legislation.
Storm Water Management	Funds collected for this service are to be used for items such as channelization, erosion control, Credit River Watershed erosion control, storm water management and water quality/quantity control. This is not a discounted service, and is a uniform charge applied to both the residential and non-residential sectors on a cost per hectare basis.
Transit	Funds are collected for the purpose of providing all transit services as they relate to growth. This charge is collected from both residential and non-residential development activities. A 10% discount has already been factored into the charge.

Appendix 2

2018 Development Charge Reserve Funds, Bonus Zoning and Cash-in-Lieu of Parkland Continuity Schedule

Fund Name	Balance January 1, 2018	Revenues					Capital Expenditures			Balance December 31, 2018
		From Revenue	Interest	From Developers	Other	Total Revenue	DCA / General Reserve Refunds	Transfers To/ (From) Capital[1]	Transfers To Revenue	
DCA- City Holding	31,427.88	0.00	0.00	(9,247.11)	0.00	(9,247.11)	22,180.40	0.00	0.00	0.37
DCA-General Government	(4,036,507.90)	0.00	(294,856.76)	471,467.11	0.00	176,610.35	0.00	270,000.00	0.00	(4,129,897.55)
DCA-Recreation and Parks	1,903,991.44	0.00	184,819.73	14,626,396.50	0.00	14,811,216.23	0.00	6,404,809.49	0.00	10,310,398.18
DCA-Recreation (Hershey)	0.00	0.00	19,948.12	(19,948.12)	0.00	0.00	0.00	0.00	0.00	0.00
DCA-Fire Services	(12,933,865.01)	0.00	(906,054.39)	1,807,197.79	0.00	901,143.40	0.00	759,794.28	0.00	(12,792,515.89)
DCA-Library	(1,148,734.41)	0.00	(58,174.63)	1,643,415.34	0.00	1,585,240.71	0.00	(353,151.65)	0.00	789,657.95
DCA-Transit	3,560,137.22	0.00	222,915.33	3,134,869.32	0.00	3,357,784.65	0.00	450,000.00	0.00	6,467,921.87
DCA-City Wide Engineering	15,825,615.73	0.00	804,223.65	30,006,984.89	0.00	30,811,208.54	0.00	15,950,948.61	0.00	30,685,875.66
DCA-Public Works	(807,519.73)	0.00	(35,821.52)	1,367,904.52	0.00	1,332,083.00	0.00	(8,875,152.47)	150,000.00	9,249,715.74
DCA-Parking	2,895,235.12	0.00	146,226.72	816,972.34	0.00	963,199.06	0.00	0.00	0.00	3,858,434.18
DCA-LAC	0.00	0.00	5,440.40	(5,440.40)	0.00	0.00	0.00	0.00	0.00	0.00
DCA-Storm Water	28,696,997.82	0.00	1,338,755.83	3,362,154.31	0.00	4,700,910.14	0.00	944,942.49	0.00	32,452,965.47
DC Appeal - Residential	3,711,023.04	0.00	232,479.04	3,621,236.20	0.00	3,853,715.24	0.00	0.00	0.00	7,564,738.28
DC Appeal - Industrial	1,528,003.64	0.00	75,289.84	638,001.54	0.00	713,291.38	0.00	0.00	0.00	2,241,295.02
DC Appeal - Non-Industrial	908,362.81	0.00	43,052.01	280,361.97	0.00	323,413.98	0.00	0.00	0.00	1,231,776.79
Total DC Reserve Funds	**40,134,167.65**	**0.00**	**1,778,243.37**	**61,742,326.20**	**0.00**	**63,520,569.57**	**22,180.40**	**15,552,190.75**	**150,000.00**	**87,930,366.07**
Bonus Zoning (section 37)	**1,540,097.61**	**0.00**	**63,612.06**	**1,295,330.00**	**0.00**	**1,358,942.06**	**0.00**	**660,000.00**	**0.00**	**2,239,039.67**
Cash-in-Lieu of Parkland (section 42)	**70,981,895.90**	**13,134,828.45**	**2,860,249.07**	**23,271,608.00**	**10,000.00**	**39,276,685.52**	**0.00**	**6,284,551.88**	**0.00**	**103,974,029.54**

[1] Details of the transfers to/(from) Reserve Funds by project are shown in Appendix 3.

Appendix 3

Capital Projects Financed by Development Charge Reserve Funds and Cash-in-Lieu of Parklands
December 31, 2018

Description: This report highlights all Development Charge, Cash-in-Lieu of Parkland Reserve Fund and Other Sources of funding transfers to Capital Projects in 2018.

Project Number	Description	2018 Development Charge Financing		2018 Cash-in-Lieu of Parkland		2018 Other Financing			Total Project Net Financing By Project and Reserve	Total Project Net Financing
		Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Debt Financing		
6104	**Torbram Grade Separation (North)**									(68,341,000)
	City Wide Engineering - 31335		(6,500,000)						(68,341,000)	
7132	**Mississauga Storm Water Quality Strategy**									(376,068)
	Storm Water Management - 31350	123,932							(376,068)	
8159	**Creditview Rd Bridge over Credit River**									(9,684,700)
	City Wide Engineering - 31335		(516,665)						(6,671,665)	
	Capital Reserve Fund - 33121						(171,805)		(2,218,505)	
	Debt Management RF-Tax Capital - 37100						(61,530)		(61,530)	
	- Debt Financing								(733,000)	
8171	**Traffic Signal Equipment Enhancements**									(2,262,000)
	City Wide Engineering - 31335	724,072							(1,999,887)	
	Capital Reserve Fund - 33121					479,327			185,161	
	Contributions - Road - 35201					296,601			(447,275)	
8173	**Traffic System and ITS**									(6,900,000)
	City Wide Engineering - 31335		(724,072)						(4,616,038)	
	Capital Reserve Fund - 33121						(117,291)		(311,299)	
	Contributions - Road - 35201						(296,601)		(1,610,628)	
	- Debt Financing						(362,036)	(362,036)	(362,036)	
8322	**Class 1 & 3 Trails - Design & Construction**									(3,916,330)
	Recreation - 31315	3,670							(3,916,330)	
9307	**P 471 Basic Development Phase II - design &**									(933,128)
	Recreation - 31315	11,872							(933,128)	
9430	**Meadowvale Library/CC Reno-Design**									(35,060,000)
	Recreation - 31315	51,160							(896,840)	
	Library - 31325	353,152							(6,190,748)	
	Cash-in-Lieu of Parkland - 32121			1,228,818					(21,541,182)	
	Capital Reserve Fund - 33121					366,070			(2,779,930)	
	- Debt Financing								(3,651,300)	
10135	**Credit River Erosion Control - S of Dundas**									(113,254)
	Storm Water Management - 31350	876							(2,124)	
	Capital Reserve Fund - 33121					45,869			(111,131)	
10147	**Cooksville Creek Erosion Control - Willa**									(133,165)
	Storm Water Management - 31350	1,353							(3,847)	
	Capital Reserve Fund - 33121					45,482			(129,318)	
11122	**Preliminary Engineering Studies**									(61,114)
	City Wide Engineering - 31335	21,886							(61,114)	

Appendix 3

Capital Projects Financed by Development Charge Reserve Funds and Cash-in-Lieu of Parklands
December 31, 2018

Description: This report highlights all Development Charge, Cash-in-Lieu of Parkland Reserve Fund and Other Sources of funding transfers to Capital Projects in 2018.

Project Number	Description	2018 Development Charge Financing		2018 Cash-in-Lieu of Parkland		2018 Other Financing			Total Project Net Financing By Project and Reserve	Total Project Net Financing
		Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Debt Financing		
11140	**Cooksville Creek Erosion Ctr-Rathburn**									(160,127)
	City Wide Engineering - 31335								(7,000)	
	Storm Water Management - 31350	2,330							2,330	
	Capital Reserve Fund - 33121					77,544			(155,456)	
11142	**Cooksville Creek-Burnhamthorpe Rd to**									(102,513)
	City Wide Engineering - 31335								(6,000)	
	Storm Water Management - 31350	2,763							2,763	
	Capital Reserve Fund - 33121					84,724			(99,276)	
11167	**Cycling Program**									(3,724,454)
	City Wide Engineering - 31335	45,546							(3,724,454)	
11302	**Parkway Belt Dev (P302) Construction**									(5,277,652)
	Recreation - 31315								(4,504,352)	
	Cash-in-Lieu of Parkland - 32121				(92,729)				(272,817)	
	Capital Reserve Fund - 33121								(500,484)	
11309	**Dr Martin Dobkin Washrooms - Construction**									(864,796)
	Cash-in-Lieu of Parkland - 32121			57,204					(864,796)	
11313	**Lisgar Fields Washrooms - Construction**									(889,042)
	Cash-in-Lieu of Parkland - 32121			48,958					(889,042)	
11325	**Pinchin Barn - foundation restoration**									(203,000)
	Recreation - 31315		(43,200)						(182,700)	
	Capital Reserve Fund - 33121						(4,800)		(20,300)	
12105	**Creditview Rd - Argentia Rd to Old Creditview**									(371,054)
	Recreation - 31315								(300,000)	
	City Wide Engineering - 31335	28,946							(71,054)	
12109	**Dundas Street West/Ninth Line West - PH 1**									(2,461,024)
	Recreation - 31315								(1,000,000)	
	City Wide Engineering - 31335	88,976							(1,461,024)	
12131	**Credit River Erosion - Behind Steen Dr**									(567,873)
	Storm Water Management - 31350	4,973							(10,027)	
	Capital Reserve Fund - 33121					13,034			(94,966)	
	Federal Gas Tax Reserve Fund - 35183					264,119			(462,881)	
12139	**Cooksville Creek Improvement & Flood**									(1,370,000)
	Storm Water Management - 31350		(2,913)						(39,913)	
	Capital Reserve Fund - 33121									
	Federal Gas Tax Reserve Fund - 35183								(1,233,000)	
	- Debt Financing						(97,087)	(97,087)	(97,087)	

Appendix 3

Capital Projects Financed by Development Charge Reserve Funds and Cash-in-Lieu of Parklands
December 31, 2018

Description: This report highlights all Development Charge, Cash-in-Lieu of Parkland Reserve Fund and Other Sources of funding transfers to Capital Projects in 2018.

Project Number	Description	2018 Development Charge Financing		2018 Cash-in-Lieu of Parkland		2018 Other Financing			Total Project Net Financing By Project and Reserve	Total Project Net Financing
		Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Debt Financing		
12141	**Ninth Line Corridor Scoped Subwatershed**									(393,988)
	City Wide Engineering - 31335		(13,662)						(107,650)	
	Storm Water Management - 31350		(36,338)						(286,338)	
12193	**Permanent Snow Storage Sites Design &**									(72,660)
	Public Works - 31340	9,208,948							(66,426)	
	Capital Reserve Fund - 33121					864,304			(6,234)	
12269	**Design and Construction of Station 120**									(7,855,000)
	Fire Services - 31320		(623,141)				(623,141)		(6,483,141)	
	Capital Reserve Fund - 33121						(831,859)		(1,371,859)	
12307	**Hydro One Corridor - Oakville to Credit River -**									(217,352)
	Recreation - 31315	2,084,998							(195,616)	
	Capital Reserve Fund - 33121					231,666			(21,736)	
12308	**Hydro One Corridor - Credit River to Toronto -**									(1,337,200)
	Recreation - 31315	1,002,960							(1,203,480)	
	Capital Reserve Fund - 33121					111,440			(133,720)	
12312	**Fallingbrook Community Washrooms-Constr.**									(1,000,000)
	Cash-in-Lieu of Parkland - 32121			100,000					(1,000,000)	
13102	**DCA Study (Major Roads)**									(164,697)
	City Wide Engineering - 31335	35,303							(164,697)	
13111	**9th Line - Transportation Boundary**									0
	City Wide Engineering - 31335	100,000								
13135	**Loyalist Creek Erosion Control upstream**									(90,000)
	Storm Water Management - 31350	5,878							(1,322)	
	Capital Reserve Fund - 33121					71,837			(16,163)	
	- Debt Financing					322,286		322,286	(72,514)	
13312	**Erindale Park Washroom Replace-Design**									(2,364,446)
	Cash-in-Lieu of Parkland - 32121				(918,442)				(2,333,212)	
	Mascan Creditview Recreation - 35339								(31,234)	
13313	**Garnetwood Washrooms - Construction**									(900,200)
	Cash-in-Lieu of Parkland - 32121			200,000					(900,200)	
13327	**Park P_508 Development - Construction**									(1,560,100)
	Recreation - 31315		(36,449)						(1,404,042)	
	Capital Reserve Fund - 33121						(4,051)		(156,058)	
13329	**Site Work - Ninth Line North of Eglinton**									(192,869)
	Recreation - 31315	76,432							(173,568)	
	Capital Reserve Fund - 33121					8,499			(19,301)	

Appendix 3

Capital Projects Financed by Development Charge Reserve Funds and Cash-in-Lieu of Parklands
December 31, 2018

Description: This report highlights all Development Charge, Cash-in-Lieu of Parkland Reserve Fund and Other Sources of funding transfers to Capital Projects in 2018.

Project Number	Description	2018 Development Charge Financing		2018 Cash-in-Lieu of Parkland		2018 Other Financing			Total Project Net Financing By Project and Reserve	Total Project Net Financing
		Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Debt Financing		
13331	**Multi- Use Trails - ORT-07 Ctl PKY - L Eto Ck**									(666,646)
	Recreation - 31315	499,950							(586,682)	
	Capital Reserve Fund - 33121					55,550			(79,965)	
14101	**Intersection Capital Program**									(492,225)
	City Wide Engineering - 31335	2,775							(492,225)	
14102	**Mavis Rd- Courtneypark to N City Limits**									(364,107)
	City Wide Engineering - 31335	135,893							(364,107)	
14105	**Second Line Over HWY. 401- Bridge**									(536,466)
	Recreation - 31315									
	City Wide Engineering - 31335		(18,890)						(153,276)	
	Capital Reserve Fund - 33121						(70,284)		(70,284)	
	Debt Management RF-Tax Capital - 37100					23,058			187,094	
	- Debt Financing								(500,000)	
14106	**Goreway Drive Grade Separation**									(3,722,609)
	City Wide Engineering - 31335		(1,300,000)						(3,722,609)	
14107	**9the Widening-Derry Rd to North Limit**									(3,239,980)
	City Wide Engineering - 31335	1,675,530							(2,832,570)	
	Capital Reserve Fund - 33121									
	Federal Gas Tax Reserve Fund - 35182					14,488			(386,232)	
	Contributions - Road - 35201								(32,540)	
	Debt Management RF-Tax Capital - 37100					111,542			461,362	
	- Debt Financing								(450,000)	
14141	**Cooksville Crk Impr&Flood Prot/Paisley**									(7,619,641)
	Storm Water Management - 31350		(83,990)						(233,335)	
	Capital Reserve Fund - 33121						(2,386,306)		(2,386,306)	
	- Debt Financing								(5,000,000)	
14146	**Cooksville Creek Flood Protection-Dyking**									(5,199,022)
	Storm Water Management - 31350		(29,065)						(151,110)	
	Capital Reserve Fund - 33121						(970,935)		(1,856,412)	
	- Debt Financing								(3,191,500)	
14163	**New Vehicles & Equipment**									(194,251)
	Public Works - 31340	674							(174,826)	
	Capital Reserve Fund - 33121					75			(19,425)	
14176	**Multi-Use Trails along Hanlan Routes**									(2,284,240)
	City Wide Engineering - 31335	184							(2,284,240)	

Appendix 3

Capital Projects Financed by Development Charge Reserve Funds and Cash-in-Lieu of Parklands
December 31, 2018

Description: This report highlights all Development Charge, Cash-in-Lieu of Parkland Reserve Fund and Other Sources of funding transfers to Capital Projects in 2018.

Project Number	Description	2018 Development Charge Financing		2018 Cash-in-Lieu of Parkland		2018 Other Financing			Total Project Net Financing By Project and Reserve	Total Project Net Financing
		Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Debt Financing		
14197	Property Acquisition									(1,534,657)
	City Wide Engineering - 31335		(1,897)						(1,534,657)	
14269	New Fire Truck - Fire Station 120									(836,653)
	Fire Services - 31320		(136,653)				(136,653)		(836,653)	
14301	Community Parkland - Acquisition of F_410									(7,849,766)
	Cash-in-Lieu of Parkland - 32121			180,234					(7,849,766)	
14306	Sawmill Valley Trail -Bird Property Link									(422,956)
	Recreation - 31315		(125,981)						(380,602)	
	Capital Reserve Fund - 33121						(14,019)		(42,354)	
14310	Inclusive Playground - Rivergrove Park									(492,800)
	Recreation - 31315		(75,596)						(443,496)	
	Capital Reserve Fund - 33121						(8,404)		(49,304)	
15102	Transportation Master Plan Study									(432,755)
	City Wide Engineering - 31335		(62)						(432,755)	
15104	Lakeshore Road Movement Study									(1,442,755)
	City Wide Engineering - 31335		(62)						(1,442,755)	
15109	Creditview Rd Widening Structure Design									0
	City Wide Engineering - 31335	450,000								
	Capital Reserve Fund - 33121					50,000				
15131	Loyalist Creek Erosion Cntl-Thornlodge RD									(160,000)
	Storm Water Management - 31350		(2,040)						(5,440)	
	Capital Reserve Fund - 33121						(57,960)		(154,560)	
15135	Cksvl Crk Erosion Ctrl-Willa Rd to Orano									(570,000)
	Storm Water Management - 31350	3,400							(19,380)	
	Debt Management RF-Tax Capital - 37100					96,600			96,600	
	- Debt Financing								(647,220)	
15136	Cksvl Crk Erosion Ctrl-Hwy403 to Hwy10									(120,000)
	Storm Water Management - 31350		(1,700)						(4,080)	
	Capital Reserve Fund - 33121						(48,300)		(115,920)	
15139	Cksvl Crk Impr & Flood Prot/King St East									(704)
	Storm Water Management - 31350	83,990							(24)	
	Capital Reserve Fund - 33121					2,386,306			(680)	
15141	Moore Crk Erosion Ctrl-Lakeshore Rd W									(580,000)
	Storm Water Management - 31350		(349)						(1,349)	
	Capital Reserve Fund - 33121						(31,395)		(121,395)	
	Stormwater-Capital Reserve Fund - 35992						(118,256)		(457,256)	

Appendix 3

Capital Projects Financed by Development Charge Reserve Funds and Cash-in-Lieu of Parklands
December 31, 2018

Description: This report highlights all Development Charge, Cash-in-Lieu of Parkland Reserve Fund and Other Sources of funding transfers to Capital Projects in 2018.

Project Number	Description	2018 Development Charge Financing		2018 Cash-in-Lieu of Parkland		2018 Other Financing			Total Project Net Financing By Project and Reserve	Total Project Net Financing
		Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Debt Financing		
15163	New Vehicles & Equipment									(195,426)
	Public Works - 31340		(383)						(175,883)	
	Capital Reserve Fund - 33121						(43)		(19,543)	
15165	Sidewalks									(942,737)
	City Wide Engineering - 31335	57,263							(942,737)	
15238	Transit Malton Facility-Expans & Improve									(4,000,000)
	Transit - 31330		(450,000)				(450,000)		(3,600,000)	
	Federal Gas Tax Reserve Fund - 35183						(50,000)		(400,000)	
15310	Port Credit Harbour West Side									(381,237)
	Recreation - 31315	43,887							(343,113)	
	Capital Reserve Fund - 33121					4,876			(38,124)	
15319	Community PksPhase 1 Not Yet Name P_459									(12,615,710)
	Recreation - 31315		(3,954,867)						(11,354,441)	
	Capital Reserve Fund - 33121						(285,757)		(383,596)	
	Federal Gas Tax Reserve Fund - 35182						(153,673)		(153,673)	
	- Debt Financing								(724,000)	
15325	Parks Bunker Installation: New - Loyola									(2,869)
	Cash-in-Lieu of Parkland - 32121			42,131					(2,869)	
15334	Growth Related Equipment - Parks									(205,128)
	Public Works - 31340		(115)						(184,615)	
	Capital Reserve Fund - 33121						(13)		(20,513)	
15431	Park 459 Development - Partnership									(8,100,000)
	Recreation - 31315		(1,938,485)						(7,040,000)	
	Capital Reserve Fund - 33121						(165)		(73,835)	
	Federal Gas Tax Reserve Fund - 35182						(493,165)		(493,165)	
	- Debt Financing								(493,000)	
15729	Meadowvale Four Rinks- Arena Refrigeration									(666,365)
	Cash-in-Lieu of Parkland - 32121			83,035					(666,365)	
16107	QEW/Credit River Active Trans Assessment									(620,000)
	City Wide Engineering - 31335		(75,000)						(620,000)	
16134	Monitor & Minor Modification SW-Various									(39,060)
	Storm Water Management - 31350	40,940							(39,060)	
16161	Noise Wall Program									(1,387,941)
	City Wide Engineering - 31335		(338,941)						(1,387,941)	
	Capital Reserve Fund - 33121					586,000				

Appendix 3

Capital Projects Financed by Development Charge Reserve Funds and Cash-in-Lieu of Parklands
December 31, 2018

Description: This report highlights all Development Charge, Cash-in-Lieu of Parkland Reserve Fund and Other Sources of funding transfers to Capital Projects in 2018.

Project Number	Description	2018 Development Charge Financing		2018 Cash-in-Lieu of Parkland		2018 Other Financing			Total Project Net Financing By Project and Reserve	Total Project Net Financing
		Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Debt Financing		
16165	**Sidewalks**									(389,926)
	City Wide Engineering - 31335	46,724							(303,276)	
	Contributions - Sidewalks - 35207					13,350			(86,650)	
16312	**City Centre Scholar's Green**									(493,395)
	Recreation - 31315		(67,500)						(444,055)	
	Capital Reserve Fund - 33121						(490)		(32,486)	
	Federal Gas Tax Reserve Fund - 35182						(7,010)		(16,854)	
16316	**Growth Related Equipment - Parks**									(143,435)
	Public Works - 31340		(391)						(129,091)	
	Capital Reserve Fund - 33121						(43)		(14,343)	
16326	**Design & Construction**									(438,111)
	Recreation - 31315		(322,650)						(394,292)	
	Capital Reserve Fund - 33121						(35,850)		(43,820)	
16332	**Park Utilization Tracking**									(247,500)
	Recreation - 31315		(37,125)						(111,375)	
	Reserve for Contingencies - 30125						(45,375)		(136,125)	
16339	**Partnership with the PDSB & Govt Grant**									(1,548,000)
	Recreation - 31315		(261,000)						(1,161,000)	
	Capital Reserve Fund - 33121						(87,000)		(387,000)	
16340	**Community Parks_Phase 1 P_459**									(3,470,894)
	Recreation - 31315		(322,553)						(1,143,805)	
	Cash-in-Lieu of Parkland - 32121				(1,378,666)				(2,200,000)	
	Capital Reserve Fund - 33121						(35,839)		(127,089)	
17013	**Little Etobicoke Ck Erosion Ctrl**									0
	Storm Water Management - 31350	1,000								
	Stormwater-Capital Reserve Fund - 35992					59,000				
17014	**Levi Creek Watercourse Realignment**									(331,118)
	Storm Water Management - 31350		(1,087)						(1,138)	
	Stormwater-Capital Reserve Fund - 35992						(318,975)		(329,980)	
17015	**Mary Fix Ck Erosion Ctrl-S of Dundas**									(1,119,421)
	Storm Water Management - 31350		(11,007)						(11,563)	
	Stormwater-Capital Reserve Fund - 35992						(1,086,556)		(1,107,858)	
17017	**Pinnacle SWMF-near Hurontario/Eglinton**									(2,250,000)
	Storm Water Management - 31350		(68,000)						(76,500)	
	Stormwater-Capital Reserve Fund - 35992						(1,932,000)		(2,173,500)	

Appendix 3

Capital Projects Financed by Development Charge Reserve Funds and Cash-in-Lieu of Parklands
December 31, 2018

Description: This report highlights all Development Charge, Cash-in-Lieu of Parkland Reserve Fund and Other Sources of funding transfers to Capital Projects in 2018.

Project Number	Description	2018 Development Charge Financing		2018 Cash-in-Lieu of Parkland		2018 Other Financing			Total Project Net Financing By Project and Reserve	Total Project Net Financing
		Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Debt Financing		
17019	**Cooksville Ck Floor SWMF #2103 (P-096)**									(288,210)
	Storm Water Management - 31350		(5,932)						(10,057)	
	Stormwater-Capital Reserve Fund - 35992						(164,068)		(278,153)	
17106	**Square One Drive - Confederation Parkway**									(1,050,000)
	City Wide Engineering - 31335		(950,000)						(1,050,000)	
17130	**Storm Sewer Oversizing-Various Locations**									0
	Storm Water Management - 31350	270,000								
17171	**Traffic Signal Equipment Enhancements**									(79,652)
	City Wide Engineering - 31335		(237)						(79,652)	
17173	**Traffic Systems and ITS**									(39,824)
	City Wide Engineering - 31335	131							(39,824)	
17182	**Pedestrian & Cyclist Access-Transitway**									(4,434,048)
	City Wide Engineering - 31335	310							(1,991,301)	
	Capital Reserve Fund - 33121						(340,112)		(2,442,747)	
17304	**Future Directions review (Full)**									(330,000)
	Recreation - 31315		(99,000)						(297,000)	
	Reserve for Contingencies - 30125						(11,000)		(33,000)	
17308	**Riverwood VC-Study & Preliminary Design**									(95,000)
	Recreation - 31315		(18,000)						(85,500)	
	Reserve for Contingencies - 30125						(2,000)		(9,500)	
17312	**ComPks-Basic Development-F_034**									(1,570,464)
	Recreation - 31315		(1,110,729)						(1,403,418)	
	Capital Reserve Fund - 33121						(8,801)		(8,801)	
	Federal Gas Tax Reserve Fund - 35182						(125,724)		(158,245)	
17313	**ComPks-Design & Cons (Harris Property)**									(1,015,000)
	Recreation - 31315		(247,500)						(913,500)	
	Capital Reserve Fund - 33121						(1,800)		(1,800)	
	Federal Gas Tax Reserve Fund - 35182						(25,700)		(99,700)	
17341	**Vehicles & Equipment - Growth - Parks**									(195,644)
	Public Works - 31340	3,920							(176,080)	
	Capital Reserve Fund - 33121					436			(19,564)	
17390	**Land Acquisition Downtown, Cooksville**									(1,001,073)
	Cash-in-Lieu of Parkland - 32121			1,227					(1,001,073)	
17391	**Land Acquisition Cooksville Creek**									(1,797,391)
	Cash-in-Lieu of Parkland - 32121			359					(1,797,391)	

Appendix 3

Capital Projects Financed by Development Charge Reserve Funds and Cash-in-Lieu of Parklands
December 31, 2018

Description: This report highlights all Development Charge, Cash-in-Lieu of Parkland Reserve Fund and Other Sources of funding transfers to Capital Projects in 2018.

Project Number	Description	2018 Development Charge Financing		2018 Cash-in-Lieu of Parkland		2018 Other Financing			Total Project Net Financing By Project and Reserve	Total Project Net Financing
		Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Debt Financing		
17601	DC Background Study 2017									(300,000)
	Capital Reserve Fund - 33121						(20,000)		(30,000)	
	General Government - 31310		(180,000)						(270,000)	
18002	Etobicoke Crk Erosion Ctrl-Eglinton									(338,502)
	Storm Water Management - 31350		(10,578)						(10,578)	
	Stormwater-Capital Reserve Fund - 35992						(327,924)		(327,924)	
18004	Cooksville Crk Flood Protect-H.Molasy									(350,000)
	Storm Water Management - 31350		(12,000)						(12,000)	
	Stormwater-Capital Reserve Fund - 35992						(338,000)		(338,000)	
18005	Cooksville Crk Erosion Control- CP Rwy									(480,000)
	Storm Water Management - 31350		(16,000)						(16,000)	
	Stormwater-Capital Reserve Fund - 35992						(464,000)		(464,000)	
18009	Lakeview Master Drainage Plan									(380,000)
	Storm Water Management - 31350		(380,000)						(380,000)	
18010	Port Credit Master Drainage Plan									(380,000)
	Storm Water Management - 31350		(380,000)						(380,000)	
18013	Little Etobicoke Ck Erosion Ctrl-Dundas									(150,000)
	Storm Water Management - 31350		(3,000)						(3,000)	
	Stormwater-Capital Reserve Fund - 35992						(147,000)		(147,000)	
18016	Credit River Erosion Control and Ice Dam									(170,000)
	Storm Water Management - 31350		(3,000)						(3,000)	
	Stormwater-Capital Reserve Fund - 35992						(167,000)		(167,000)	
18017	Credit River Erosion Ctrl=Barbertown Brg									(124,000)
	Storm Water Management - 31350		(1,378)						(1,378)	
	Stormwater-Capital Reserve Fund - 35992						(122,622)		(122,622)	
18101	Intersection Capital Program									(1,355,000)
	City Wide Engineering - 31335		(1,355,000)						(1,355,000)	
18102	Mavis Rd from Courtneypark Dr to North									(5,000,000)
	City Wide Engineering - 31335		(4,600,000)						(4,600,000)	
	Capital Reserve Fund - 33121						(40,000)		(40,000)	
	Federal Gas Tax Reserve Fund - 35182						(360,000)		(360,000)	
18103	Preliminary Engineering Studies									(100,000)
	City Wide Engineering - 31335		(100,000)						(100,000)	
18105	Creditview Rd Widening from Bancroft Rd									(500,000)
	City Wide Engineering - 31335		(450,000)						(450,000)	
	Capital Reserve Fund - 33121						(50,000)		(50,000)	

Appendix 3

Capital Projects Financed by Development Charge Reserve Funds and Cash-in-Lieu of Parklands
December 31, 2018

Description: This report highlights all Development Charge, Cash-in-Lieu of Parkland Reserve Fund and Other Sources of funding transfers to Capital Projects in 2018.

Project Number	Description	2018 Development Charge Financing		2018 Cash-in-Lieu of Parkland		2018 Other Financing			Total Project Net Financing By Project and Reserve	Total Project Net Financing
		Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Debt Financing		
18106	**Burnhamthorpe Road E Reconstruction**									(6,360,000)
	City Wide Engineering - 31335		(360,000)						(360,000)	
	Federal Gas Tax Reserve Fund - 35182						(5,400,000)		(5,400,000)	
	- Debt Financing						(600,000)	(600,000)	(600,000)	
18130	**Storm Sewer Oversizing-Various Locations**									(270,000)
	Storm Water Management - 31350		(270,000)						(270,000)	
18134	**Monitoring & Minor modification of SWMF**									(80,000)
	Storm Water Management - 31350		(80,000)						(80,000)	
18135	**Applewood Crk Erosion Control - Lakeview**									(450,000)
	Storm Water Management - 31350		(5,000)						(5,000)	
	Stormwater-Capital Reserve Fund - 35992						(445,000)		(445,000)	
18142	**Etobicoke Crk Erosion Ctrl-Pony Trl Dr**									(1,200,000)
	Storm Water Management - 31350		(38,000)						(38,000)	
	Stormwater-Capital Reserve Fund - 35992						(1,162,000)		(1,162,000)	
18144	**Mimico Crk Erosion Control-Etude Drive**									(110,000)
	Storm Water Management - 31350		(5,000)						(5,000)	
	Stormwater-Capital Reserve Fund - 35992						(105,000)		(105,000)	
18145	**Minor Erosion Ctrl Work-Various Locations**									(80,000)
	Storm Water Management - 31350		(3,000)						(3,000)	
	Stormwater-Capital Reserve Fund - 35992						(77,000)		(77,000)	
18147	**Sheridan Crk Erosion Ctrl-Lushes Ave.**									(530,000)
	Storm Water Management - 31350		(28,000)						(28,000)	
	Stormwater-Capital Reserve Fund - 35992						(502,000)		(502,000)	
18148	**Mimico Crk Erosion Ctrl-Rena Rd**									(210,000)
	Storm Water Management - 31350		(9,000)						(9,000)	
	Stormwater-Capital Reserve Fund - 35992						(201,000)		(201,000)	
18163	**New Vehicles & Equipment**									(195,000)
	Public Works - 31340		(175,500)						(175,500)	
	Capital Reserve Fund - 33121						(19,500)		(19,500)	
18165	**Sidewalks**									(490,000)
	City Wide Engineering - 31335		(350,000)						(350,000)	
	Contributions - Sidewalks - 35207						(140,000)		(140,000)	
18171	**Traffice Signal Equipment Enhancements**									(150,000)
	City Wide Engineering - 31335		(150,000)						(150,000)	
18173	**Traffic System and ITS**									(75,000)
	City Wide Engineering - 31335		(75,000)						(75,000)	

Appendix 3

Capital Projects Financed by Development Charge Reserve Funds and Cash-in-Lieu of Parklands
December 31, 2018

Description: This report highlights all Development Charge, Cash-in-Lieu of Parkland Reserve Fund and Other Sources of funding transfers to Capital Projects in 2018.

Project Number	Description	2018 Development Charge Financing		2018 Cash-in-Lieu of Parkland		2018 Other Financing			Total Project Net Financing By Project and Reserve	Total Project Net Financing
		Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Debt Financing		
18186	Cycling Program (Structures)									(300,000)
	City Wide Engineering - 31335		(300,000)						(300,000)	
18188	Noise Wall Retrofit (DC)									(520,000)
	City Wide Engineering - 31335		(520,000)						(520,000)	
18197	Property Acquisition									(75,000)
	City Wide Engineering - 31335		(75,000)						(75,000)	
18198	Traffic Signals - New									(710,000)
	City Wide Engineering - 31335		(340,000)						(340,000)	
	Contributions - Traffic Signals - 35209						(370,000)		(370,000)	
18200	Property Acquisition									(250,000)
	City Wide Engineering - 31335		(250,000)						(250,000)	
18300	Downtown Parkland Acquisition									(2,000,000)
	Cash-in-Lieu of Parkland - 32121				(2,000,000)				(2,000,000)	
18301	Land Acquisition Cooksville Creek F-541									(995,727)
	Cash-in-Lieu of Parkland - 32121				(995,727)				(995,727)	
18302	Land Acquisition Cooksville Creek F-517									(1,617,852)
	Cash-in-Lieu of Parkland - 32121				(1,617,852)				(1,617,852)	
18303	Land Acquisition Cooksville Creek F-524									(1,113,103)
	Cash-in-Lieu of Parkland - 32121				(1,113,103)				(1,113,103)	
18306	Parkland Acquisition Program									(110,000)
	Cash-in-Lieu of Parkland - 32121				(110,000)				(110,000)	
18311	Vehicles & Equip - Growth Related									(180,000)
	Public Works - 31340		(162,000)						(162,000)	
	Capital Reserve Fund - 33121						(18,000)		(18,000)	
18320	Marina Park - Rivergate Walk & Shoreline									(575,225)
	Recreation - 31315		(517,762)						(517,762)	
	Capital Reserve Fund - 33121						(57,463)		(57,463)	
18322	Bicycle/Pedestrian System Development									0
	Recreation - 31315									
	Capital Reserve Fund - 33121									
18323	Bicycle/Pedestrian System Development									(280,980)
	Recreation - 31315		(252,882)						(252,882)	
	Capital Reserve Fund - 33121						(28,098)		(28,098)	
18334	Park Not Yet Named (F_410) (Willow Glen)									(21,000)
	Recreation - 31315		(18,900)						(18,900)	
	Capital Reserve Fund - 33121						(2,100)		(2,100)	

Appendix 3

Capital Projects Financed by Development Charge Reserve Funds and Cash-in-Lieu of Parklands
December 31, 2018

Description: This report highlights all Development Charge, Cash-in-Lieu of Parkland Reserve Fund and Other Sources of funding transfers to Capital Projects in 2018.

Project Number	Description	2018 Development Charge Financing		2018 Cash-in-Lieu of Parkland		2018 Other Financing			Total Project Net Financing By Project and Reserve	Total Project Net Financing
		Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Transfers to Reserve	Transfers from Reserve	Debt Financing		
18335	Park Dev Exp Const Zonta Meadows (P_294)									(133,500)
	Recreation - 31315		(120,150)						(120,150)	
	Capital Reserve Fund - 33121						(13,350)		(13,350)	
18342	Park (F_408) (Pheasant Run Addition									(7,000)
	Recreation - 31315		(6,300)						(6,300)	
	Capital Reserve Fund - 33121						(700)		(700)	
18346	Park Dev-Not Yt Named (F_410) (Willow Glen)									(91,000)
	Recreation - 31315		(81,900)						(81,900)	
	Capital Reserve Fund - 33121						(9,100)		(9,100)	
18347	Outdoor Basketball (2 Hoops)									(41,910)
	Recreation - 31315		(37,719)						(37,719)	
	Capital Reserve Fund - 33121						(4,191)		(4,191)	
18348	Design & Construction - F_408									(299,800)
	Recreation - 31315		(269,820)						(269,820)	
	Capital Reserve Fund - 33121						(29,980)		(29,980)	
18349	Sun-Canadian Pipeline Trail Development									(237,412)
	Recreation - 31315		(213,671)						(213,671)	
	Capital Reserve Fund - 33121						(23,741)		(23,741)	
18612	DC Background Study - Consulting									(100,000)
	Capital Reserve Fund - 33121						(10,000)		(10,000)	
	General Government - 31310		(90,000)						(90,000)	
TOTAL FINANCING ALL YEARS ALL SOURCES									**(279,654,629)**	**(279,654,629)**
TOTAL FINANCING TRANSFERRED IN 2018		**17,296,598**	**(32,848,788)**	**1,941,967**	**(8,226,519)**	**6,684,083**	**(23,328,641)**	**(136,837)**		
NET FINANCING TOTALS			**(15,552,191)**		**(6,284,552)**					

Appendix 4

2018 Development Levy Credit Continuity Schedule

Section 14 Development Levy Credits represent payments made by our developers under the old lot levy regime that can be applied against future development charge activity. These credits are recognized by the City as a liability on our Financial Statements.

M Plan	Applicant	Value of Prepaid City Credits @ Jan 1, 2018	Storms Waived @ Jan 1, 2018	Roads Waived @ Jan 1, 2018	Other Services Waived @ Jan 1, 2018	Value of Prepaid and Waived Credits @ Jan 1, 2018	Prepaid Credits Redeemed in 2018	Waived Services Redeemed in 2018	Value of Prepaid and Waived Credits @ Dec 31, 2018
M-957	1181482 Ontario Ltd	63,201	173,187	0	0	236,388	0	0	236,388
M-948	1236236 Ontario Inc.	21,282	63,921	0	0	85,203	0	0	85,203
M-901	763442 Ontario Limited (Indrio)	77,233	0	0	0	77,233	0	0	77,233
M-915	Annovator Investments	80,861	277,659	0	0	358,520	0	0	358,520
OZ-50/90	Bohler Uddeholm Thermo Tech	10,102	26,617	0	0	36,719	0	0	36,719
M-915	Boldco Group Inc.	87,551	378,535	0	0	466,086	0	0	466,086
M-584	Brookfield Commercial Properties/Gentra Inc.	0	333,590	0	0	333,590	0	0	333,590
M-284	Cadillac Fairview Corp Ltd	0	318,033	521,417	0	839,450	0	0	839,450
M-425	Canonfield Inc.	0	672,973	1,320,891	0	1,993,864	0	0	1,993,864
M-793	Canonfield Inc.	221,561	830,879	0	0	1,052,440	0	0	1,052,440
43R-13128	City Centre Plaza	0	377,236	4,027,887	0	4,405,123	0	0	4,405,123
M-814	Dariusz Krowiak	1,212	0	0	0	1,212	0	0	1,212
M-852	Dundee Realty Corp	24,274	78,903	0	0	103,177	0	0	103,177
M-539	Eric Robbins	4,078	10,986	0	0	15,064	0	0	15,064
M-871	Erin Mills Development Corporation	0	7,727	0	0	7,727	0	0	7,727
M-781	Erin Mills Development Corporation	99,253	86,893	0	0	186,146	0	0	186,146
M-592	Erin Mills Development Corporation	59,314	311,617	0	0	370,931	0	0	370,931
T-84051 R-23352 RCP 1003	Erin Mills Development Corporation	0	1,421,212	0	0	1,421,212	0	-203,024	1,218,188
M-823	Erin Mills Development Corporation	13,520	679,504	1,764,594	0	2,457,618	0	0	2,457,618
M-908 & R-	Erin Mills Development Corporation	0	163,199	2,316,040	0	2,479,239	0	0	2,479,239
RP1542	Erin Mills Development Corporation	0	2,434,327	2,933,756	0	5,368,082	0	0	5,368,082
T-86106 & 43R-22605	Erin Mills Development Corporation	0	1,618,205	3,704,914	0	5,323,119	0	0	5,323,119
OZ-88/86	Erin Mills Development Corporation	0	438,400	4,941,898	0	5,380,298	0	-5,265,847	114,451
B-111/87	Everlast Construction	710	48,500	95,195	0	144,406	0	0	144,406
M-677	Great West Life Assurance Company	13,167	184,764	0	0	197,931	0	0	197,931
M-948	Impulse Technologies Ltd.	6,198	18,616	0	0	24,814	0	0	24,814
M-757	Kaiser Photo Products	5,163	18,997	0	0	24,160	0	0	24,160
OZ-50/90	Keanall Holdings Ltd.	123,196	324,601	0	0	447,797	0	0	447,797
M-1015	Kee Group Inc.	28	80	0	0	108	0	0	108
M-635	Kee Group Inc.	2,922	16,979	0	0	19,901	0	0	19,901
M-728	Kee Group Inc.	3,881	20,974	0	0	24,855	0	0	24,855
M-793	Lord Realty Holdings Ltd	7,008	74,908	0	0	81,916	0	0	81,916
M-533	Lord Realty Holdings Ltd	0	647,304	0	0	647,304	0	0	647,304
M-852	Meadowpines Development Corporation	202,513	966,982	0	0	1,169,495	0	0	1,169,495
M-689	Menkes Industrial Parks Ltd	36,004	179,779	0	0	215,783	0	0	215,783
M-845	N.H.D. Developments Limited	17,059	54,083	0	0	71,141	0	0	71,141

Appendix 4

2018 Development Levy Credit Continuity Schedule

Section 14 Development Levy Credits represent payments made by our developers under the old lot levy regime that can be applied against future development charge activity. These credits are recognized by the City as a liability on our Financial Statements.

M Plan	Applicant	Value of Prepaid City Credits @ Jan 1, 2018	Storms Waived @ Jan 1, 2018	Roads Waived @ Jan 1, 2018	Other Services Waived @ Jan 1, 2018	Value of Prepaid and Waived Credits @ Jan 1, 2018	Prepaid Credits Redeemed in 2018	Waived Services Redeemed in 2018	Value of Prepaid and Waived Credits @ Dec 31, 2018
M-401	OMERS REALTY MGMT CORP	15,125	242,702	0	0	257,827	0	0	257,827
M-1010	OMERS REALTY MGMT CORP	0	5,121,334	12,817,482	6,130,285	24,069,102	0	0	24,069,102
M-1023	Orlando Corporation	36,818	89,890	0	0	126,707	0	0	126,707
M-832	Orlando Corporation	75,997	273,547	0	0	349,544	0	0	349,544
M-900	Orlando Corporation	0	499	874,778	0	875,277	0	0	875,277
M-948	Richill Construction Limited	40,901	122,849	0	0	163,750	0	0	163,750
M-886	Riello Burners	15,768	46,942	0	0	62,711	0	0	62,711
M-1326	Rivergrove Development	98,844	352,447	0	0	451,290	0	0	451,290
M-901	Slough Estates Canada Ltd	83,971	373,970	0	0	457,941	0	0	457,941
M-435	Tordar Investments Ltd	11,774	164,797	0	0	176,572	0	0	176,572
M-922	Trailmobile Canada Inc	1,869	5,463	0	0	7,332	0	0	7,332
M-926	Tridel	1	0	0	0	1	0	0	1
OZ-50/90	Uddeholm	6,478	17,069	0	0	23,547	0	0	23,547
M-886	Uddeholm	15,347	45,944	0	0	61,291	0	0	61,291
Total		**1,584,184**	**20,117,624**	**35,318,852**	**6,130,285**	**63,150,946**	**0**	**-5,468,871**	**57,682,075**

Note: Opening balance for waived services will fluctuate with rate changes.

Appendix 5

2018 Development Charge Credits Continuity Schedule

Represents Development Charge Credits for work being undertaken by the Developer.
Municipalities have the ability to offer credits towards development charges in exchange for services paid for by the Developer

M Plan	Developer	Type of DC Credit	Outstanding DC Credits Issued in Prior Years	Total Credits Used in Prior Years	DC Credits Balance @ Jan. 1, 2018	DC Credits Used during 2018	DC Credits Granted by Council during 2018	DC Credits Balance @ Dec. 31, 2018	GC Approval
M-1447	1296421 Ontario Inc.	Storm Water Mgmt	858,653	(681,906)	176,747			176,747	276-2000
M-1759	678604 Ontario Inc.	Park Development	12,981	(11,554)	1,427			1,427	GC 0574-2007
M-1874	678604 Ontario Inc. and 1105239 Ontario Inc.	Other Services	219,607	0	219,607			219,607	GC 0548-2011
M-1484	919848 Ontario Inc. & 1368781 Ontario Inc.	Park Development	27,574	(8,685)	18,889			18,889	178-2001
M-1474 & M-1475	968907 Ontario Inc. & Gasmuz Construction Inc.	Park Development	334,835	(334,833)	1			1	329-2001
M-1272	996075 Ontario Ltd	Park Development	19,600	(615)	18,985			18,985	597-97
M-1894	Argo Park Developments Corporation	Park Development	234,840	(234,839)	1			1	GC 0408-2012
M-1894	Argo Park Developments Corporation	Other Services	75,400	(75,398)	2			2	GC 0446-2012
M-950, M-1263	Berlen Development Corp	Park Development	32,892	(31,895)	997			997	604-1997
M-1460 & M-1461	Britannia Holdings	Other Services	234,467	(234,467)	(1)			(1)	161-2001
M-1366	Britannia Meadows Development Corp	Transportation	187,250	(183,484)	3,766			3,766	442-1999
M-1366	Britannia Meadows Development Corp	Park Development	292,432	(287,485)	4,947			4,947	650-1999
M-1493 & M-1494	Britannia North Holdings Inc.	Other Services	187,675	(187,674)	1			1	546-2001
M-1077 & M-1078 & M-1080	EMDC	Park Development	59,341	(58,815)	526			526	247-93
M-1079 & M-1081 & M-1082	EMDC	Park Development	476,214	(465,971)	10,243			10,243	212-93
M-1537 & M-1538	EMDC	Other Services	225,000	(198,876)	26,124			26,124	358-2002
M-1553/ M-1554	EMDC	Storm Water Mgmt	698,288	(694,675)	3,613			3,613	324-2001
M-1606, M-1607, M-1607, M-1608, M-1609	EMDC	Other Services	423,750	(423,749)	1			1	527-2003
M-1606, M-1607, M-1607, M-1608, M-1609	EMDC	Park Development	873,957	(873,955)	2			2	552-2003
M-1635, M-1636, M-1637	EMDC	Transportation	276,750	(276,751)	(1)			(1)	076-2004
M-1635, M-1636, M-1637	EMDC	Park Development	265,930	(265,929)	1			1	077-2004
M-1663, M-1664, M-1665	EMDC	Storm Water Mgmt	1,503,000	(1,503,029)	(29)			(29)	437-2002
M-1663, M-1664, M-1665	EMDC	Park Development	177,345	(153,616)	23,729			23,729	532-2004
M-1700 M-1701 M-1702	EMDC	Park Development	573,805	(573,806)	(1)			(1)	GC 0623-2005
M-1700 M-1701 M-1702 PN04-140	EMDC	Storm Water Mgmt	3,130,400	(3,125,900)	4,500			4,500	GC 0571-2005

Appendix 5

2018 Development Charge Credits Continuity Schedule

Represents Development Charge Credits for work being undertaken by the Developer.
Municipalities have the ability to offer credits towards development charges in exchange for services paid for by the Developer

M Plan	Developer	Type of DC Credit	Outstanding DC Credits Issued in Prior Years	Total Credits Used in Prior Years	DC Credits Balance @ Jan. 1, 2018	DC Credits Used during 2018	DC Credits Granted by Council during 2018	DC Credits Balance @ Dec. 31, 2018	GC Approval
M-1767 & M-1768	EMDC	Park Development	612,974	(612,972)	2			2	GC 0335-2008
PN-02-130	EMDC	Storm Water Mgmt	299,200	0	299,200			299,200	527-2003
	EMDC	Transportation	25,000	0	25,000			25,000	107-93
	EMDC	Transportation	40,000	0	40,000			40,000	107-93
M-1733, M-1734, M-1735, M-1736	Erin Mills Development	Park Development	617,888	(618,740)	(852)			(852)	GC 0603-2006
M-1419 & M-1420	Fieldrun Development Corporation	Park Development	457,149		457,149			457,149	222-2000
M-1213 & M-1214 & M-1675	Fourth Terragar Holdings Ltd	Park Development	95,108	(95,107)	1			1	531-2002
M-1305	Fourth Terragar Holdings Ltd	Park Development	13,589	(13,685)	(97)			(97)	161-1998
M-1557	Gadan Properties Inc	Park Development	254,199	(251,310)	2,889			2,889	600-2002
M-1335	Graylight Properties Ltd	Transportation	203,490	(198,896)	4,594			4,594	812-1998
M-1128	Jannock Properties	Park Development	181,838	(181,841)	(3)			(3)	163-94
M-1483	KZK Group	Park Development	3,771	(2,606)	1,164			1,164	216-2001
M-1653	Matgo Developments Inc.	Park Development	174,653	(163,310)	11,342			11,342	477-2004
M-1563	Mattamy (Country Club) Ltd	Park Development	24,750	(21,656)	3,094			3,094	532-2002
M-1468	Mattamy Homes (Lorne Park)	Storm Water Mgmt	184,336	(182,520)	1,816			1,816	9-2001
M-1565	Mattamy Homes (Lorne Park)	Storm Water Mgmt	109,951	(109,378)	573			573	9-2001
M-1468	Mattamy Ltd	Park Development	451,254	(126,707)	324,547			324,547	125-2001
M-1565	Mattamy Ltd	Park Development	300,836	(299,243)	1,593			1,593	125-2001
M-1497	Monarch Construction Ltd	Park Development	11,067	(9,881)	1,186			1,186	527-2001
M-1781	Partacc Mississauga Dev. Inc	Park Development	15,794	(15,792)	2			2	GC 0804-2008
M-1596	Southlawn Developments Inc.	Park Development	26,500	(26,497)	3			3	455-2003
M-1526	Steelgate Security Products Ltd	Park Development	48,477	(43,932)	4,545			4,545	548-2001 & 481-2001
M-1741	Stone Manor Developments	Park Development	30,456	(30,453)	3			3	GC 0518-2006
M-1502	Summit Meadow Ltd	Park Development	45,924	(45,486)	438			438	528-2001
M-1772	Taccpar Gate Developments Inc.	Park Development	211,687	(211,686)	1			1	GC 0470-2008
M-1246	Tarmac Canada Inc	Park Development	443,299	(439,842)	3,457			3,457	344-97

Appendix 5

2018 Development Charge Credits Continuity Schedule

Represents Development Charge Credits for work being undertaken by the Developer.
Municipalities have the ability to offer credits towards development charges in exchange for services paid for by the Developer

M Plan	Developer	Type of DC Credit	Outstanding DC Credits Issued in Prior Years	Total Credits Used in Prior Years	DC Credits Balance @ Jan. 1, 2018	DC Credits Used during 2018	DC Credits Granted by Council during 2018	DC Credits Balance @ Dec. 31, 2018	GC Approval
M-1476 & M-1477	Todbrook Investors Inc & Gasmuz Construction Inc	Park Development	214,152	(202,847)	11,305			11,305	330-2001
M-1476 & M-1477	Todbrook Investors Inc & Gasmuz Construction Inc	Other Services	340,775	(322,787)	17,988			17,988	323-2001
M-1535 & M-1536	Westport Realty Ltd	Park Development	4,884	(2,394)	2,490			2,490	156-2002
M-1509	Woodhaven Investments (1996) Inc	Park Development	410,267	(409,621)	646			646	547-2001
Total			**26,110,809**	**(24,382,659)**	**1,728,150**	**0**	**0**	**1,728,150**	

Summary of Credits by Type

Type of DC Credit	Outstanding DC Credits Issued in Prior Years	Total Credits Used in Prior Years	DC Credits Balance @ Jan. 1, 2018	Total 2018 Credits Used during 2018	DC Credits Granted by Council during 2018	DC Credits Balance @ Dec. 31, 2018
Park Development	8,605,218	(7,700,567)	904,650	0	0	904,650
Storm Water Mgmt	14,498,042	(14,011,622)	486,420	0	0	486,420
Other Services	2,275,059	(2,011,338)	263,721	0	0	263,721
Transportation	732,490	(659,132)	73,358	0	0	73,358
Total	**26,110,809**	**(24,382,659)**	**1,728,150**	**0**	**0**	**1,728,150**

Statement of Compliance

The City of Mississauga's Annual Treasurer's Statement Report: Summary of Development Charges Activity in 2018, has been prepared reflecting the City's current practices and policies which are currently under review. The outcome of the review may or may not require minor changes in current policies and practices to ensure that the City is in compliance with Section 59.1 (1) of the *Development Charges Act 1997*, which requires:

59.1 (1) A municipality shall not impose, directly or indirectly, a charge related to a development or a requirement to construct a service related to development, except as permitted by this Act or another Act. 2015, c.26, s.8.

Jeffrey J Jackson, MBA, CPA, CA
Director of Finance and Treasurer
City of Mississauga

REPORT 6 - 2019

To: CHAIR AND MEMBERS OF GENERAL COMMITTEE

The Mississauga Cycling Adivsory Committee presents its sixth report for 2019 and recommends:

MCAC-0040-2019
That Guy Winchester, Citizen Member be appointed to Chair of the Network and Technical Subcommittee for the period ending November 14, 2022, or until a successor is appointed.

(MCAC-0041-2019)
That the Infrastructure Review Project be approved as presented.
(MCAC-0041-2019)

MCAC-0042-2019
That Anna Tran, Citizen Member be appointed to Chair of the Promotions and Communications Subcommittee for the period ending November 14, 2022, or until a successor is appointed.
(MCAC-0042-2019)

(MCAC-0043-2019)
That the Mississauga Cycling Advisory Committee Work Plan be deferred to the July MCAC (MCAC) meeting for further consideration.
(MCAC-0043-2019)

MCAC-0044-2019
That the memorandum dated May 31, 2019 from Fred Sandoval entitled Cycling Program 2019 June Update be received.
(MCAC-0044-2019)

MCAC-0045-2019
That the amended Mississauga Cycling Advisory Committee Terms of Reference be approved.
(MCAC-0045-2019)

MCAC-0046-2019
That the Bicycle Friendly Communities Workshop Summary be referred to the July Mississauga Cycling Advisory Committee for further consideration.
(MCAC-0046-2019)

MCAC-0047-2019
That Suzanne Doyle, Citizen Member be appointed to the Vision Zero Education and Awareness Working Group.
(MCAC-0047-2019)

MCAC-0048-2019
That the email dated April 18, 2019 from Kris Hammel, Citizen Member entitled Dundas and

Confederation Improvements be received for information.
(MCAC-0048-2019)

MCAC-0049-2019
That the update on E-bikes Update from Matthew Sweet, Manager, Active Transportation be received.
(MCAC-0049-2019)

MCAC-0050-2019
That the news article entitled Cambridge's New Bike Lane Law is 'Bikelash'-Proof be received for information.
(MCAC-0050-2019)

REPORT 2 - 2019

To: CHAIR AND MEMBERS OF GENERAL COMMITTEE

The Towing Industry Advisory Committee presents its second report for 2019 and recommends:
TIAC-0002-2019

1. That a by-law be enacted to amend the Tow Truck Licensing By-law 0521-2004, as amended, to increase the all-inclusive collision tow rate not going to a collision reporting centre from $290.00 to $300.00
2. That a by-law be enacted to amend the Tow Truck Licensing By-law 0521-2004, as amended, to add an all-inclusive collision tow rate going to a collision reporting centre to $400.00
3. That staff review and report back on the current re-tow rates

(TIAC-0002-2019)

REPORT 3 - 2019

To: CHAIR AND MEMBERS OF GENERAL COMMITTEE

The Accessibility Advisory Committee presents its third report for 2019 and recommends:

AAC-0027-2019
That the deputation and associated presentation by Dan Sadler, Accessibility Supervisor and Dayna Obaseki, Legislative Coordinator presenting an Orientation overview for the Members of the Accessibility Advisory Committee be received.
(AAC-0027-2019)

AAC-0028-2019
That a proposed Accessibility Advisory Committee Work Plan be brought forward to a future AAC meeting to be reviewed, approved and further implemented.
(AAC-0028-2019)

AAC-0029-2019
That the 2019-2022 Accessibility Advisory Committee Terms of Reference be approved.
(AAC-0029-2019)

AAC-0030-2019
1. That the presentation regarding Bicycle Bypass Lanes at the Skymark Drive and Explorer Drive Roundabout to the Facility Accessibility Design Subcommittee on May 27, 2019, be received;
2. That subject to the comments on the presentation, the Facility Accessibility Design Subcommittee is satisfied with the initiatives the City is undertaking with respect to the Bicycle Bypass Lanes at the Skymark Drive and Explorer Drive Roundabout.

(AAC-0030-2019)

AAC-0031-2019
1. That the presentation regarding Development of Park 524 and 525 to the Facility Accessibility Design Subcommittee on May 27, 2019, be received;
2. That subject to the comments on the presentation, the Facility Accessibility Design Subcommittee is satisfied with the initiatives the MBTW Group, MBTW | WAI is undertaking with respect to the Development of Park 524 and 525.

(AAC-0031-2019)

AAC-0032-2019
1. That the presentation regarding Accessible Beach Routes to the Facility Accessibility Design Subcommittee on May 27, 2019, be received;
2. That subject to the comments on the presentation, the Facility Accessibility Design Subcommittee is satisfied with the initiatives the City is undertaking with respect to accessible beach mats.

(AAC-0032-2019)