

Date: November 12, 2021	Originator's files:
To: Chair and Members of General Committee	
From: Shari Lichterman, CPA, CMA, Commissioner of Corporate Services and Chief Financial Officer	Meeting date: December 1, 2021

Subject

5G Technical Assessment Report

Recommendation

That the report from the Commissioner of Corporate Services and Chief Financial Officer dated November 12, 2021, entitled "5G Technical Assessment Report" be received.

Executive Summary

- City of Mississauga staff have been actively assessing the implications of 5G through the engagement of key internal and external stakeholders, including benchmarking across Canada and globally.
- The scope of the assessment includes planning and operational changes required to facilitate 5G on the supporting infrastructure within the City right-of-way and on City owned lands.
- New processes are in place, related fees in the Fees and Charges By-law have been established and existing light poles have been redesigned and approved by ESA that will accommodate 5G and other pole attachments. The City will implement a new online permitting process that will enable telecommunication providers to select a pole and initiate the permit process.
- Master Agreements with the telecommunications providers have been drafted and will come forward to Council early in 2022 for approval, which will simplify and enable the implementation of 5G.
- The health related concerns of 5G have been researched and reported out by Public Health Canada and locally here by the Region of Peel Health who have provided comment throughout this assessment process.
- To help explain 5G and how it will be implemented and used, an interactive 5G Story Map has been created along with the 5G FAQ's previously published on the Smart City website. FAQ's were also provided to 311 and Mayor and Council offices.

Background

City of Mississauga staff have been actively assessing the implications of 5G. To ensure cross discipline expertise, a Project Steering Committee consisting of key stakeholders from several operational areas in each department was established. There are specific synergies with Street Lights pole infrastructure for small cell attachment as well as Advanced Traffic Management given the emphasis on IoT and future considerations of Autonomous Vehicles.

The term 5G can be defined as the “fifth generation technology standard for cellular networks”, and with it brings ultrafast and reliable communications. In municipalities, this will enable, through the provision of high-speed broadband, a variety of services including safer roads, waste collection, green power grids and much more. Connectivity has become essential for the cultural, social, and economic development of a municipality and it is predicted that by 2024 more than 1.5 billion devices will be connected to 5G.

The global deployment of 5G is taking place with varying degrees of implementation, ranging from full-scale builds to pilot projects that demonstrate capabilities and economic benefits. The introduction and proliferation of Small Cell equipment deployed within the street right-of-way on hydro poles and streetlights has impacts on the public realm. One solution that the City of Mississauga has explored to address Small Cell clutter is the redesign of street light poles into “Smart Poles” that incorporate the required features needed for 5G small cell deployment.

Innovation, Science and Economic Development Canada (ISED) manages the governance and licensing of cellular spectrum. The results from the Spectrum auction, which ended July 23rd, 2021, illustrate the heavy investments made by each Carrier. Bell, Rogers and Xplornet acquired the 5G spectrum rights in the Toronto area.

To make best use of different types of spectrum, 5G deployment will include a mix of traditional cell towers and antennas on rooftops carrying signals over long distances as well as 5G Small Cells at lower heights supporting huge bandwidth use over shorter distances.

Comments

The deployment of Small Cells in Mississauga will concentrate in high foot traffic areas, such as Business Improvement Areas (BIA), Mississauga’s downtown core and urban areas. Subdivisions and areas without above ground power poles are not likely to be selected. Carriers will not rely exclusively on City-owned infrastructure, as they have a healthy mix of telco-owned assets, private assets, and utility agreements that they would leverage.

Third Party entities such as, Telecommunication Service Providers and other municipal partners may request permission, and access to City of Mississauga Streetlight poles to co-locate third party equipment. These devices can range from Road Weather stations, Traffic Sensors, Telecommunications Cellular Radios, Wi-Fi Access points, Environmental sensors, as well as other Internet of Things (IoT) devices.

Third Party entities are responsible for submitting detailed information regarding their proposed Cellular Small Cell equipment. The City of Mississauga and Alectra Utilities must approve all pole attachments and installations must follow existing City of Mississauga PUCC/Road Occupancy processes. Fees and charges for Pole Attachment Permits have recently been added and approved in the Fees and Charges By-law.

Staff from various departments have been engaged and are working towards a Master Agreement for Pole Attachments with Telecommunication Service Providers and it is expected that these will come to Council for approval early in 2022.

The City of Mississauga has been working closely with Street Lighting Pole vendors to make modifications to the design of standard street light poles to enable the electrical and loading needs of small cell attachments and to meet Electrical Safety Authority (ESA) compliance. This, in effect, will become a Smart Pole and a new standard for future development and the incremental implementation of 5G. The telecommunications provider will bare the cost of the pole with provisions for this in the Fees and Charges By-law. The fees associated with 5G small cell attachments primarily offset the cost of installation and ongoing maintenance and administration. The City will implement a new online permitting process that will enable telecommunication providers to select a pole and initiate the permit process.

Canada's approach to radio frequency (RF) exposure safety is among the most stringent in the world. The Government of Canada continuously monitors the research and scientific literature on the health effects of RF exposure to ensure that Canadian limits are consistent with the current scientific consensus to prevent potential adverse health effects. The Region of Peel Health Department submitted a report to Regional Council regarding 5G and have identified that 5G, when implemented to the specifications identified and regulated by ISED, meets Health Canada's requirements and aligns with a standard known as Safety Code 6. The City of Mississauga will adhere to the same high level of standards by closely following Public Health Canada, CSA and Industry standards.

On August 6, 2021, following the conclusion of the 3500MHz spectrum auction, the federal government proposed exclusion and protection zones around airport runways. Exclusion zones do not permit any 5G base stations (small cells) to be in the area. Protection zones are locations around the airport where 5G services face restrictions. These restrictions are being introduced because there are concerns about possible radio frequency interference between 5G spectrum and altimeters (aviation navigation tools used in automated landing).

The City of Mississauga currently owns the largest Public Sector Network (PSN) in Canada. It boasts 985 connected sites and 47,000 km of fiber, nearly enough to cover the circumference of the Earth. The coming generation of connected technologies requires the high speed, high connectivity and low latency characteristics that 5G can provide. Some of these will be met with Mississauga's existing infrastructure (PSN, PBSN, fiber); however, there will be areas where the

fast broadband provided by 5G small cells will be required in order to achieve these benefits. There is potential to provide connectivity for 5G to telecommunication providers through the PSN leasing of its dark fiber.

Strategic Plan

The Smart City Master Plan, endorsed by Council July 2019, included several strategic initiatives including an assessment of the 5G technology standard for cellular networks, for the City of Mississauga.

Engagement and Consultation

Meetings and consultation has taken place throughout the 5G assessment process including members of the public, internal stakeholders, Realty, Corporate Sponsorship, other municipalities and levels of government, telecommunication providers, Post-Secondary institutions, land developers, governmental organizations, Region of Peel Health, utility providers, technology vendors and Industry. Information has been provided on the Smart City website and FAQ's had previously been distributed to the Mayor and Councillor's offices and 311.

Financial Impact

The implementation of 5G has introduced new fees for Pole Attachment permits in the Fees and Charges By-law. The following fees are now in effect:

- \$2,000 one-time permit fee, per attachment
- \$250 ongoing annual maintenance fee, per attachment
- One-time direct cost (cost of a new smart pole) and administrative fee, per pole

It is anticipated that the permitting process will ramp up slowly in 2022. Staff will report back in the first quarter of 2022 on potential revenue and resource requirements to address the 5G permitting process and ongoing maintenance and administration.

Conclusion

The deployment of 5G technologies promises to provide high-speed wireless connectivity, create economic opportunity and be the data transport for the Smart City movement globally.

The research and collaboration with all key stakeholders internally and externally has positioned the City of Mississauga well for the implementation of 5G. New processes are in place, related fees in the Fees and Charges By-law have been established and new standard smart poles have been designed and approved by ESA that will accommodate 5G and other pole attachments as a City Standard in locations across the City.

Master Agreements with the telecommunications providers have been drafted and will come forward to Council in the New Year for approval, which will simplify and enable the implementation of 5G. The potential for a 5G pilot may be considered under the right conditions similar to what has been seen across Canada and would be opportunity driven where good alignment can be demonstrated.

The health related concerns of 5G have been researched and reported out by Public Health Canada and locally here by the Region of Peel Health who have provided comment throughout this assessment process.

Public information in the form of FAQ's and factsheets were provided to 311 and Council early on in the assessment process and with the 5G Story map and additional resources available online, there is a good set of resources for the public to access to gain a better understanding of what 5G is.

Attachments

Appendix 1: 5G Technical Assessment Report



Shari Lichterman, CPA, CMA, Commissioner of Corporate Services and Chief Financial Officer

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