



AGENDA

GAS, POWER AND TELECOMMUNICATIONS COMMITTEE

February 13, 2020, 1:00 PM

LEGAL TRADITIONS COMMITTEE ROOM

Members

Councillor S. Chu, Chair
Councillor D. Farrell, Vice-Chair
Councillor J. Davison
Councillor J. Magliocca
Chief Financial Officer C. Male
Mayor N. Nenshi, Ex-Officio

1. CALL TO ORDER
2. OPENING REMARKS
3. CONFIRMATION OF AGENDA
4. CONFIRMATION OF MINUTES
 - 4.1 Minutes of the Regular Meeting of the Gas, Power, and Telecommunications Committee, 2020 January 16
5. CONSENT AGENDA
 - 5.1 DEFERRALS AND PROCEDURAL REQUESTS
None
 - 5.2 BRIEFINGS
 - 5.2.1 Status of Outstanding Motions and Directions, GPT2020-0161
6. POSTPONED REPORTS
(including related/supplemental reports)
None

7. ITEMS FROM OFFICERS, ADMINISTRATION AND COMMITTEES

- 7.1 Fibre Infrastructure Strategy Annual Update, GPT2020-0137
Attachment 2 held confidential pursuant to Section 24 (Advice from officials) of the *Freedom of Information and Protection of Privacy Act*

Reviewed by 2035 February 13

8. ITEMS DIRECTLY TO COMMITTEE

- 8.1 REFERRED REPORTS
None

- 8.2 NOTICE(S) OF MOTION
None

9. URGENT BUSINESS

10. CONFIDENTIAL ITEMS

10.1 ITEMS FROM OFFICERS, ADMINISTRATION AND COMMITTEES

- 10.1.1 2020 Work Plan for Gas, Power and Telecommunications, GPT2020-0156
Report and attachment held confidential pursuant to Sections 23 (Local public body confidences) and 24 (Advice from officials) of the *Freedom of Information and Protection of Privacy Act*.

Review by 2025 January 31

- 10.1.2 Summary of Current Proceedings, GPT2020-0151
Report and Attachment held confidential pursuant to Sections 23 (Public body confidences) and 24 (Advice from officials) of the *Freedom of Information and Protection of Privacy Act*.

Review by 2023 February 13

10.2 URGENT BUSINESS

11. ADJOURNMENT

Members of Council may participate remotely, if required.



MINUTES

GAS, POWER AND TELECOMMUNICATIONS COMMITTEE

January 16, 2020, 1:30 PM
LEGAL TRADITIONS COMMITTEE ROOM

PRESENT: Councillor S. Chu, Chair
Councillor D. Farrell, Vice-Chair
A/Chief Financial Officer T. Nguyen

ABSENT: Councillor J. Davison
Councillor J. Magliocca

Personal
Personal

ALSO PRESENT: Deputy City Clerk J. Fraser
Legislative Advisor J. Palaschuk

1. CALL TO ORDER

Councillor Chu called the Meeting to order at 1:04 p.m.

2. OPENING REMARKS

Councillor Chu provided opening remarks.

3. CONFIRMATION OF AGENDA

Moved by A/Chief Financial Officer Nguyen

That the Agenda for the 2020 January 16 Regular Meeting of the Gas, Power and Telecommunications Committee be confirmed.

MOTION CARRIED

4. CONFIRMATION OF MINUTES

4.1 Minutes of the Regular Meeting of the Gas, Power and Telecommunications Committee, 2019 November 14

Moved by Councillor Farrell

That the Minutes of the Regular Meeting of the Gas, Power, and Telecommunications Committee meeting, held 2019 November 14, be confirmed.

MOTION CARRIED

5. CONSENT AGENDA

Moved by Councillor Farrell

That the Gas, Power and Telecommunications Committee receive the following briefings for the Corporate Record, in an omnibus motion:

5.1 DEFERRALS AND PROCEDURAL REQUESTS

None

5.2 BRIEFINGS

5.2.1 2019-2022 Alberta Utilities Commission (AUC) Strategic Plan, GPT2020-0097

5.2.2 Status of Outstanding Motions and Directions, GPT2020-0043

MOTION CARRIED

6. POSTPONED REPORTS

None

7. ITEMS FROM OFFICERS, ADMINISTRATION AND COMMITTEES

7.1 Industry Update on Electricity, Natural Gas and Telecommunications, GPT2020-0107

Moved by Councillor Farrell

That with respect to Report GPT2020-0107, the following be approved:

That the Gas, Power and Telecommunications Committee receive this Report for the Corporate Record and discussion.

MOTION CARRIED

8. ITEMS DIRECTLY TO COMMITTEE

8.1 REFERRED REPORTS

None

8.2 NOTICE(S) OF MOTION

None

9. URGENT BUSINESS

None

10. CONFIDENTIAL ITEMS

Moved by A/Chief Financial Officer Nguyen

That pursuant to Sections 23 (Local public body confidences) and 24 (Advice from officials) of the *Freedom of Information and Protection of Privacy Act*, the Gas, Power, and Telecommunications Committee move into Closed Meeting, in the Legal Traditions

Boardroom, at 1:15 p.m. to discuss confidential matters with respect to the following item:

- Summary of Current Proceedings, GPT2020-0044

MOTION CARRIED

Committee moved into Public Meeting at 2:05 p.m. with Councillor Chu in the Chair.

Moved by A/Chief Financial Officer Nguyen

That Committee rise and report.

MOTION CARRIED

10.1 ITEMS FROM OFFICERS, ADMINISTRATION AND COMMITTEES

10.1.1 Summary of Current Proceedings, GPT2020-0044

Administration in attendance during the Closed Meeting discussions with respect to Report GPT2020-0044:

City Clerks: J. Fraser and J. Palaschuk. Advice: O. Shyllon, B. Whyte, K. Hess, S. Mayer, L. Bonnett, and L. Shannon.

A confidential document was distributed with respect to Report GPT2020-0044.

Moved by Councillor Farrell

That with respect to Report GPT2020-0044, the following be approved:

That the Gas, Power and Telecommunications Committee:

1. Receive the confidential distribution for the Corporate Record;
2. Direct Administration to preserve strategic options respecting proceedings before the Alberta Utilities Commission;
3. Recommend that Council provide strategic direction to Administration no later than 2020 February 03 with respect to Alberta Utilities Commission proceedings; and
4. Direct that the report, attachment, distribution, and discussions remain confidential pursuant to Sections 23 (Local public body confidences) and 24 (Advice from officials) of the *Freedom of Information and Protection of Privacy Act*, to be reviewed 2023 January 16.

MOTION CARRIED

10.2 URGENT BUSINESS

None

11. ADJOURNMENT

Moved by A/Chief Financial Officer Nguyen

That this meeting adjourn at 2:06 p.m.

MOTION CARRIED

THE FOLLOWING ITEM HAS BEEN FORWARDED TO THE 2020 FEBRUARY 03
COMBINED MEETING OF COUNCIL:

CONSENT:

- Summary of Current Proceedings, GPT2020-0044

The next Regular Meeting of the Gas, Power and Telecommunications Committee is
scheduled to be held 2020 February 13 at 1:00 p.m.

CONFIRMED BY COMMITTEE ON

CHAIR

ACTING CITY CLERK

BRIEFING

Page 1 of 1

Item # 5.2.1

**Chief Financial Officer's Briefing to
Gas, Power and Telecommunications
2020 February 13**

**ISC: UNRESTRICTED
GPT2020-0161**

Status of Outstanding Motions and Directions

PURPOSE OF BRIEFING

This briefing details the outstanding items for the Gas, Power and Telecommunications (GPT) Committee from the meeting of 2020 January 16.

SUPPORTING INFORMATION

The GPT Committee has directed that this briefing be prepared on a monthly basis for each scheduled meeting. This briefing, and Attachment 1, provides a summary of outstanding items for the GPT Committee.

For the specific items listed in Attachment 1, the background is available in the original report presented to GPT as well as the minutes of the applicable GPT meeting. This report is in alignment with the mandate of the Gas, Power and Telecommunications Committee.

This briefing tracks outstanding motions and directions from the GPT Committee to Administration. The attachment 1 has no specific risk associated with it. Directions or motions with risk implications will be addressed in the attachment or a separate report on the directions or motions.

ATTACHMENT(S)

1. Attachment 1 – Status of Outstanding Motions and Directions

STATUS OF OUTSTANDING MOTIONS AND DIRECTIONS

GPT 2020-0161
Attachment 1

ITEM	DATE OF REQUEST	REQUEST	COMMITTEE DIRECTION	STATUS
Decision to intervene in 2021 Generic Cost of Capital proceeding to be made at 2020 February 3 Council meeting	2020 January 16	Direction	Refer the Decision over whether to fully intervene in the AUC Proceeding 24110 – 2021 Generic Cost of Capital to the 2020 February 3 Combined meeting of Council. Prepare a presentation for the Council meeting highlighting the additional profit-taking being proposed by the utilities.	On-going

Chief Financial Officer's Report to
Gas, Power and Telecommunications
2020 February 13

ISC: UNRESTRICTED
GPT2020-0137

Fibre Infrastructure Strategy Annual Update

EXECUTIVE SUMMARY

This report serves as the fourth annual update (2019) on the implementation of The City of Calgary's Fibre Infrastructure Strategy.

Due to the current economic situation, the One Calgary (2019-2022) capital budget of \$8 million for the Fibre Infrastructure Strategy is considerably less than the Action Plan (2015-2018) capital budget of \$20 million.

In 2019, revenues broke through the \$1 million milestone, which occurred sooner than projected. It is expected that future revenues will see modest increases as the reduced capital budget will slow the pace of construction.

The City has made progress on all areas of the strategy, including:

- Connecting more City facilities and assets, avoiding costs from third-party entities;
- Building more fibre within the downtown core, while reaching more traffic controllers;
- Implementing in greenfield developments as part of the Four-Party Shallow Utility Consortium;
- Licensing City fibre to external agencies;
- Building relationships, educating and collaborating with many internal and external agencies; and
- Continuing to participate in Canadian Radio-Television and Telecommunications Commission's policies and reviews.

The City and ENMAX Telecommunications Services Inc. (ETSI), a subsidiary of ENMAX Corporation, are working on a partnership to leverage assets such as streetlight poles and power poles to serve the 5G market.

ADMINISTRATION RECOMMENDATION:

That Gas, Power & Telecommunications Committee:

1. Receive this report for the Corporate Record; and
2. Direct that Attachment 2 be held confidential pursuant to Section 24 (Advice from officials) of the *Freedom of Information and Protection of Privacy Act*, to be reviewed by 2035 February 13.

PREVIOUS COUNCIL DIRECTION / POLICY

In 2015 September, Council approved the Fibre Infrastructure Strategy (GP2015-0485) with an annual update.

BACKGROUND

For the last 19 years, The City of Calgary Information Technology (IT) business unit has been leveraging capital works projects to take advantage of economies of scale to deploy fibre optic to support City services. The Fibre Cable Duct and Wireless (FCDW) steering committee was established in 2002 to provide governance for The City's fibre infrastructure. Membership of the FCDW committee includes the directors of Transit, Roads, Water Services, Transportation

**Chief Financial Officer's Report to
Gas, Power and Telecommunications
2020 February 13**

**ISC: UNRESTRICTED
GPT2020-0137**

Fibre Infrastructure Strategy Annual Update

Infrastructure, Facility Management and IT. This has enabled over 550 km of fibre optic to be deployed throughout Calgary.

The primary focus is to connect all City buildings, facilities and assets. The excess capacity in City fibre optic has been licensed to civic partners, universities, school boards, businesses and carriers. All revenue is transferred to the Information Technology Reserve and is used for future fibre builds for City services and to support operating costs.

INVESTIGATION: ALTERNATIVES AND ANALYSIS

Fibre Infrastructure Strategy Annual Report

To provide an annual update on the key elements of the fibre strategy including:

- Monitoring and participating in regulatory and/or policy related events with the top concern being the federal announcement of The Modernization of the Telecommunications, Broadcasting and Radiocommunications Act. Changes to this suite of legislation can impose restrictions on how municipalities govern their rights-of-way and assets, such as poles and facilities, and these sweeping changes could last for decades.
- The general progress of connecting City assets to the fibre network and the estimated cost avoidance achieved.
- The City operates as a fibre-optic provider and City IT licenses excess fibre-optic capacity to other public-sector organizations, businesses or carriers. Revenues are transferred to the IT Reserve - Fibre Optic Program #751 to fund fibre deployments for City services and cover operating costs of the fibre plant.
- Supporting our local Internet Exchange (IX). IXs are found in the most prominent business centers in Canada such as Toronto and Vancouver. An IX supports fast, affordable internet and enables new business capabilities. The Calgary Internet Exchange (YYCIX) began in 2012 and is a non-profit organization run by volunteers. It is growing and gaining momentum and The City has been supporting the YYCIX by providing fibre and hosting equipment in one of The City's communication rooms.
- An updated risk assessment and mitigating strategies.

Stakeholder Engagement, Research and Communication

Governance for The City's fibre infrastructure is provided by the FCDW steering committee, which includes representatives from Transit, Roads, Water Services, Transportation Infrastructure, Facility Management and IT.

The City's Fibre team is continually researching the field of Information and Communication Technology.

Information about The City's fibre strategy is available to cities and communities across Canada through press releases and regulatory interventions.

Chief Financial Officer's Report to
Gas, Power and Telecommunications
2020 February 13

ISC: UNRESTRICTED
GPT2020-0137

Fibre Infrastructure Strategy Annual Update

Strategic Alignment

The Fibre Infrastructure Strategy is aligned with all Citizen Priorities and 2019-2022 Council Directives for One Calgary. As an example, “A City that Moves” will rely on “innovative technologies and partnerships” with “public, private sector and non-profit entities in conjunction with The City, to deliver programs to improve our transportation network, adopt new transportation business models, and position Calgary as a city that moves into the future”. Just as we move people, goods and services, fibre optics moves information – the digital version of people, goods and services.

The Fibre Infrastructure Strategy aligns with the Resilient Calgary action “Apply a Resilience Lens to Strengthen Public Infrastructure Investment Decisions”. When The City owns its own fibre infrastructure, it has maximum control over the network and can respond quickly during times of crisis (i.e. 2013 flood).

The Fibre Infrastructure Strategy aligns with One Calgary’s IT Solutions and Support service plan as it provides the foundational infrastructure for all communications for all business units.

The Fibre Infrastructure Strategy aligns with Calgary Economic Development’s Economic Strategy for Calgary titled “Calgary in the New Economy” by supporting the Business Environment focus area to “Extend dark fibre footprint of technology and innovation to provide solutions to city challenges”. The City licenses its dark fibre enabling entrepreneurs, businesses and tech companies the opportunity to build fast and reliable networks.

Social, Environmental, Economic (External)

Social: City business units rely on connectivity to deliver services to citizens. Fibre optic is the path that information takes to reach the desired endpoint whether that is a building, such as the Emergency Operation Center (EOC), or a server for analytics. City services play an important role in the social well-being of the community.

Environmental: City fibre optic has a positive effect on the environment through a number of channels. Through smart infrastructure and highly-connected devices, The City can better manage assets and increase the performance of services such as intelligent traffic systems. By licensing dark fibre, companies have an option to obtain fibre services without building their own – reducing disruptive construction activities. Many utilities and organizations require fibre connectivity to deliver enhanced services to manage efficiency such as smart grids or intelligent building management systems. All these contribute to a better environment.

Economic: The digital economy is dependent on connectivity infrastructure, and fibre optic is the fundamental infrastructure to support it. This enablement allows the community to prosper through equal access and inclusion. The City of Calgary’s Fibre Infrastructure Strategy focuses on providing fibre for City services and leasing excess capacity to other organizations.

Chief Financial Officer's Report to
Gas, Power and Telecommunications
2020 February 13

ISC: UNRESTRICTED
GPT2020-0137

Fibre Infrastructure Strategy Annual Update

Financial Capacity

Current and Future Operating Budget:

Current

The 2019 annual operating expenditure budget for the City Fibre Team is \$1.977 million.

Future

The 2020 to 2022 annual operating expenditures for the City Fibre Team remains at \$1.977 million.

Revenues derived from dark fibre licenses are applied to the operating budget. Due to capital budget reductions in 2019-2022, new fibre builds and revenue are expected to level off. Modest increases in revenue are expected, but self-funding from revenues is no longer anticipated to occur as quickly as previously forecasted.

Current and Future Capital Budget:

Current

Total capital budget approved for 2019-2022 is \$8 million.

These funds are committed for new fibre projects such as intelligent intersections, stranded facilities and next-generation City infrastructure.

Future

The capital budget reduction compared to 2015-2018 has impacted the original objectives of the Fibre Infrastructure Strategy and the pace of progress has slowed.

Risk Assessment

Through the Integrated Risk Management process, additional risks were identified along with mitigating strategies (see Attachment 2).

REASON(S) FOR RECOMMENDATION(S):

The telecommunications environment is constantly evolving and the annual report serves to keep Council apprised of the progress, challenges and future strategic directions regarding The City's fibre infrastructure.

ATTACHMENT(S)

1. Attachment 1 – Fibre Infrastructure Strategy Annual Update
2. Attachment 2 – Fibre Infrastructure Strategy Risk Assessment - CONFIDENTIAL

The City of Calgary Fibre Infrastructure Strategy Annual Update

2020 January 29

Chief Financial Officer's Department - Information Technology

Executive Summary

On 2015 September 28, the Fibre Infrastructure Strategy was presented and unanimously approved by Council. This report serves as the 2019 annual update.

By the end of 2019, over **670** facilities and assets (e.g. traffic controllers) have been fibre-connected while **avoiding** third-party communication costs estimated to be **\$8 million per year**.

In 2019, revenues reached an important milestone surpassing the **\$1 million** threshold, which represents a **180% increase** from 2015 and is well above the **\$180 thousand** originally projected in the strategy.

Two large organizations invested a combined total of **\$1 million** in capital to extend City fibre to their critical facilities. City fibre increases the resiliency of their mission critical networks which ultimately serve the citizens of Calgary.

New opportunities for revenue exist with the evolution of mobile networks to 5G/Small Cells. 5G/Small Cells require considerable fibre infrastructure. Though most Wireless Service Providers will build their own fibre facilities, there is always opportunities to provide City fibre to meet their requirements.

The City and ENMAX Telecommunications Services Inc. (ETSI), a subsidiary of ENMAX Corporation, are working on a partnership to leverage assets like streetlight poles and power poles to serve the 5G market. An agreement is expected to be in place by 2020 Q1.

Due to the current economic situation, the One Calgary (2019-2022) capital budget of \$8 million for the Fibre Infrastructure Strategy is considerably less than the Action Plan (2015-2018) capital budget of \$20 million.

The capital budget reduction has impacted the original objectives of the Fibre Infrastructure Strategy and the pace of progress has slowed.

Background

On 2015 September 28, the Fibre Infrastructure Strategy was presented and unanimously approved by Council.

The Fibre Infrastructure Strategy is critical to ensure The City of Calgary continues to provide fibre optic to deliver next-generation municipal services in a cost-effective manner.

Investment in City fibre is even more important today and into the next business cycle as our dependence on technology and data increases. City fibre is fundamental to delivering City services which contributes to **resiliency**, service **growth** and innovation and is the **foundation** of all networks which City business units rely on to ensure The City of Calgary continues to excel as a smart, safe and prosperous city now and into the future.

2015 – 2019 Accomplishments

a. Connecting Assets

In 2019, over **670** facilities and assets (e.g. traffic controllers) are fibre-connected, increasing business-unit capabilities with unlimited bandwidth and **avoiding** third party communication costs estimated to be **\$8 million per year**.

	Installed in 2019	Total Fibre Connected Assets 2001 - 2019	Notes
City Buildings (Staff Located)	13	312	Approximately \$8 million annual cost avoidance
City Field Assets	28	361	Traffic Cabinets, Help Phones, Digital Signs, CCTV, Parks, Pump and Lift Stations, Wireless Towers, Security Gates, Scale House, Underpasses, Airport Tunnel, BRT's etc.
Total	41	673	

Table 1: 2019 Number of Assets Connected with City Fibre

b. Enabling Networks

City fibre enables numerous networks for City business units, civic partners, post-secondary institutions and external agencies. The City alone has more than 20 different networks specific to its applications. As an example, the network that operates the Light Rail Transit is much different than the network that ensures clean water, but both rely on City fibre.

City fibre allows business units to upgrade their networks quickly and easily to enable new types of services. As an example, Calgary Police Service was able to upgrade their network to facilitate body cameras and other new innovations due to the capacity that City fibre affords.

The Calgary City Net (CCN) is The City's largest, most resilient network which provides high bandwidth, redundancy and security for business units. CCN's success is represented by the rate of adoption by business units. During the last budget cycle, the CCN's bandwidth demands have increased **700%** (see *Figure 1*) as business units deploy connected devices to enrich and modernize their services.

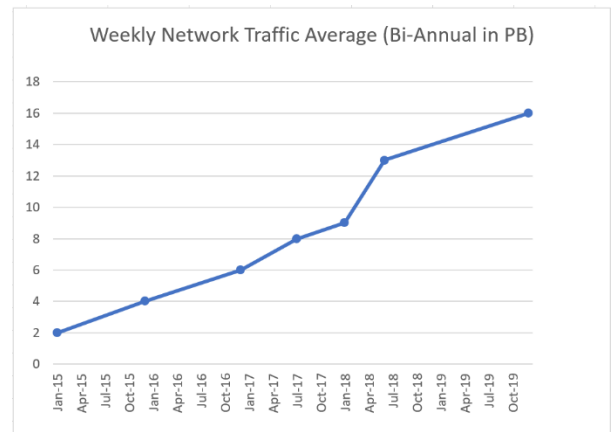


Figure 1: CCN: Bandwidth Consumption for City services [1 Petabyte (PB) = 1 million Gigabyte]

c. Increasing Resiliency

City fibre increases the resiliency of City services which, in turn, enriches citizen confidence. When a city **owns** its fibre, it can respond with greater agility during extreme events. This was exemplified during the 2013 flood where a catastrophic loss in network resources was mitigated due to the control, agility and capacity afforded through City fibre. This could not have been achieved without full control of the fibre asset.

City fibre increases the resiliency of all services that leverage it. As an example, the Roads department can monitor and control traffic signals remotely through their Management Information System for Transportation (MIST) network. The more reliable the network, the more reliable the service. Back in 2015, the network was only up 65% of the time – but now that a significant portion is on fibre optics, the network is up 98% of the time. City fibre reaches over **340** traffic controllers, resulting in an **increase** of service uptime by **50%** (see *Figure 2*) improving traffic flow through the city.

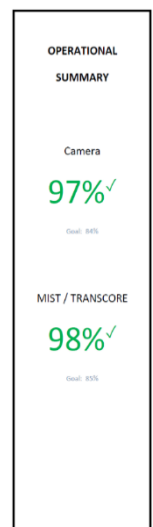


Figure 2: Traffic Network Uptime

City fibre also enhances the resiliency of **mission critical networks** operated by other agencies that offer **critical services** to citizens. Healthcare and power utility organizations license City fibre to strengthen the resilience of their services.

d. Other Notable Accomplishments:

- 2019 revenues broke through the \$1 million milestone.
- Calgary Police Service (CPS) exclusively uses City fibre to build their core network and recently upgraded that network to accommodate body camera technology.
- The new Calgary Remand Center is now fibre-connected.
- Shepard's Solar Project is now fibre-connected.
- New Southwest BRT stations are connected to City fibre.
- Calgary 911 and Corporate Security are leveraging City fibre for enhanced services and increased resiliency.
- The Calgary Public Library has standardized on City fibre.
- The City won the Ministers Award for Municipal Excellence for Municipal Owned Fibre Infrastructure (2016).
- University of Calgary research on Quantum Key Distribution published their findings in Nature Photonics in 2016. Access to City fibre was acknowledged in the research paper "Quantum teleportation across a metropolitan fibre network" to assist in testing their research in a real-life environment.
- The City won the Ministers Award for Municipal Excellence for Municipally Owned Internet of Things (IoT) Wireless Network (2018). This network is enabled by City fibre.
- The Calgary Internet Exchange is rapidly growing, in part due to City fibre making Internet faster for everyone.
- Participated in a number of Canadian Radio-television and Telecommunications Commission consultations influencing policy to include municipal interests.
- Calgary Economic Development (CED) includes City fibre as a technology enabler to attract companies to Calgary.
- Participated in regional efforts to increase the importance of municipal fibre through speaking engagements, presentation to rural council and local meetings.
- Contribute and respond to provincial consultations like the Provincial Broadband Strategy.
- City fibre transports video from over 3,000 cameras used by Corporate Security, Transit, Roads and Calgary Parking Authority.
- Fibre infrastructure plays an important role in security by design.
- City fibre is a key element to delivering on business-friendly initiatives for Living Labs in conjunction with CED.

City Fibre Strategy Alignment

The Fibre Infrastructure Strategy is aligned with all Citizen Priorities and 2019-2022 Council Directives for One Calgary. As an example, “A City that Moves” will rely on “innovative technologies and partnerships” with “public, private sector and non-profit entities in conjunction with The City, to deliver programs to improve our transportation network, adopt new transportation business models, and position Calgary as a city that moves into the future”. Just as we move people, goods and services, fibre optics moves information – the digital version of people, goods and services.

The Fibre Infrastructure Strategy aligns with the Resilient Calgary action “Apply a Resilience Lens to Strengthen Public Infrastructure Investment Decisions”. When The City owns its own fibre infrastructure, it has maximum control over the network and can respond quickly during times of crisis (i.e. 2013 flood).

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Stranded Facilities

Connectivity demands for field computing, IoT, 5G and smart city solutions are increasing every day, and this should be considered the new normal. These new demands emphasize the change in society and how cities need to adapt quickly.

Smart and resilient cities will be impacted by the rapid evolution and adoption of technology and reliance on data. What this means for The City of Calgary is that connectivity through fibre and wireless will experience **sustained and continuous** demand inciting a greater integrated approach in the planning process for both public and private sectors. By incorporating digital infrastructure into an integrated solution, The City can mitigate new technology being “bolted on” to assets with a preferred, seamless and aesthetically attractive solution emerging.

Lesson Learned: *Stranded facilities are no longer finite as sustained and continuous demands for connectivity is the new normal.*

Greenfield

Greenfield communities offered an opportunity to advance City fibre with additional cost reduction by taking advantage of the four-party trench agreement with Atco, ENMAX, Telus and Shaw. By leveraging this opportunity, The City experienced a **75% savings** in traditional construction costs. Greenfield opportunities and investment were less than projected due to the reduction of residential development and investment.

Lesson Learned: Leveraging the four-party trench is a cost-effective method of expanding City fibre.

2019 Status Update: Due to capital funding constraints, this opportunity cannot be fully leveraged as capital is directed towards greater priorities.

Business Parks and Transit-Oriented Developments

Business Parks and Transit-Oriented Developments are also opportunities to expand City fibre. Though only one opportunity was leveraged, there has been no indication of future undertakings. IT continues to work towards strengthening the value proposition with Real Estate and Development Services (RE&DS).

Revenues

As part of the Fibre Infrastructure Strategy, The City operates as a dark-fibre-optic provider and licenses excess fibre-optic capacity to other public-sector organizations, businesses and/or carriers. This revenue is growing and serves to finance further construction activities. In 2019, revenues reached an important milestone breaking the **\$1 million milestone**, which represents a **180% increase** from 2015 revenues and is well above the **\$180 thousand** originally projected in the strategy. Through Council support of the fibre strategy, a dramatic increase in revenue growth has been achieved (see Figure 3). Though revenue growth has been better than anticipated, a better understanding of the market is incenting a more targeted and focused approach to revenues. Emerging markets spurred by the trend to densify networks (5G/Small Cell, IoT) will provide new revenue opportunities.

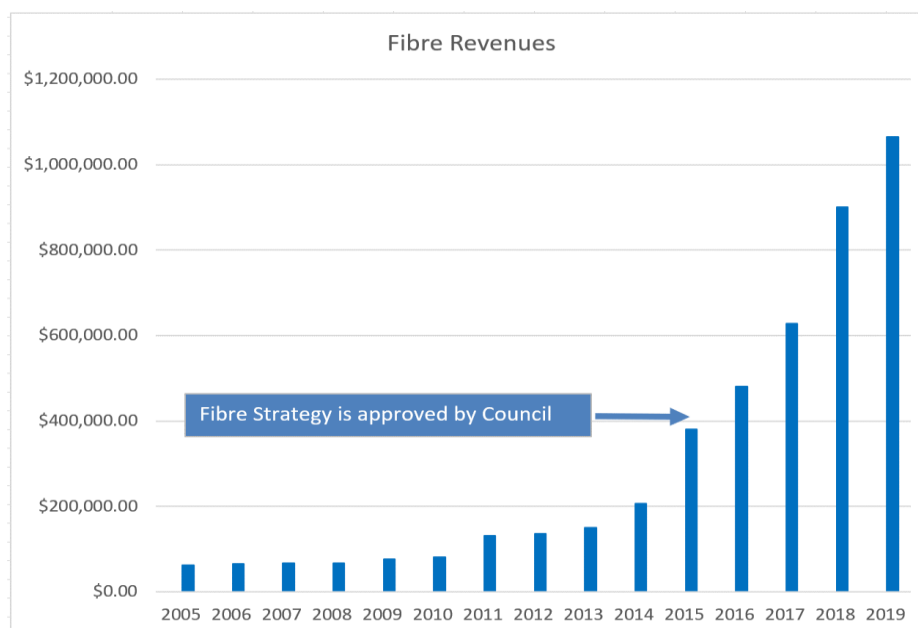


Figure 3: Current Revenues

Understanding that future demand will be continuous, and to mitigate risks arising from capital funding short falls, more emphasis on becoming **self-funded** is highly recommended. Revenues of \$3 million to \$4 million will provide a reasonable base to effectively deliver digital infrastructure.

2019 Status Update: In 2019, most of the large revenue opportunities were funded by customers, reducing the demands on The City's capital budget.

Future Opportunities

5G/Small Cell and the Evolution of Wireless Opportunities

5G/Small Cell is the next advancement in mobile and wireless technology important to connected, resilient and smart cities. It refers to wireless infrastructure that will enable many sectors and drive the digital economy by enabling automation, connected and autonomous vehicles, smart homes and field sensors. 5G/Small Cell represents a major uplift in infrastructure for Wireless Service Providers. It's more than a small antenna on a pole, it also encompasses fibre optics, large cabinets, new power cables, power meters, networking equipment, etc.

The drive for advancing wireless infrastructure is both a risk and an opportunity for The City. Wireless Service Providers' successful deployment of 5G will depend on access to municipal assets like streetlight poles and facilities resulting in thousands of third-party assets integrating with City assets. New standards, processes and agreements will manage both operational and financial risks while preserving aesthetics and public safety.

Integrated planning can mitigate the operational and financial risks affiliated with wireless infrastructure deployment on City assets and presents opportunities for new sources of revenues. Wireless infrastructure requires fibre optic to transport data and some Wireless Service Providers lack sufficient fibre optic to achieve this. Other potential sources of revenue can be found in attachment fees for antennas or co-location fees in City buildings.

2019 Status Update: The 5G opportunity is being addressed through the collaboration of numerous business units and individuals throughout the Corporation (Law & Legislative Services, Supply, Treasury, Corporate Analytics & Innovation, Information Technology and Roads). The following represents some of the initiatives underway which have been communicated via the confidential 2019 October 10 5G Ready by 2020 Report (GPT2019-1245).

1. Create the processes, agreements, standards and guidelines necessary to accelerate wireless infrastructure deployment in a cost-effective manner.
2. Develop a partnership opportunity with ENMAX to leverage streetlight and utility poles under a common infrastructure model. An agreement is anticipated 2020 Q1.
3. Strengthen the collaboration with Wireless Service Providers to facilitate 5G deployment.

Smart City, Economic Diversity, Digital Economy, Innovation, Collaboration

As The City of Calgary, in collaboration with community stakeholders, builds our communities' smart city strategy, continued investment in digital infrastructure is key to success. A smart city invests in technology and data solutions to provide excellent services to citizens.

To support Council's Business-Friendly directive, and as part of the smart city focus of diversifying our economy, The City of Calgary is partnering with CED to create the "Calgary as a Living Lab" initiative. As one of the largest owners of infrastructure in Calgary, The City is formalizing the process to open our infrastructure (where suitable) for companies and researchers to test, try and demo their products in real-world environments. The goal is to accelerate the commercialization of new products, services and research findings. It is not intended as a route for City solutions as there are avenues for those requests through existing procurement channels. For example, The City opened up Shephard Landfill for companies like Loughheed-Martin and NASA to test drone technologies. The Calgary Film Centre was used by an augmented reality software company to demo their products to potential clients.

Access to City fibre is a fundamental enabler for a large number of these technology tests as connectivity is often required. Often these ventures are limited in scope and resources; thus, providing access to municipal infrastructure at rates that encourage its use is critical to success.

2019 Status Update: The Living Labs program is achieving success with numerous projects assisting companies advance their technology.

Miscellaneous Opportunities

From time to time, unique opportunities arise which can contribute to the expansion of City fibre. These opportunities can contribute in reducing construction costs, providing conduit (Greenline) and possible funding.

Regulatory, Legislation and Advocacy

Consistent with the 2015 Fibre Infrastructure Strategy, The City's participation as an advocate in the regulatory and legislative domain is still a priority to ensure that municipal interests are represented.

Of importance is the legislative review of the Telecommunications, Broadcasting and Radiocommunications Acts. This review was initiated to modernize the Acts in relation to how technology is evolving in our society. An expert panel was assembled and a call for comments was initiated 2018 September.

Early indications suggest that some proposed legislative amendments will have significant ramifications to municipalities - impacts that could last for decades. The most significant risk municipalities face is **loss of jurisdictional control** over some components of municipal infrastructure and assets. This is mainly driven by the

proliferation of wireless technologies like 5G/Small Cell, whereby the wireless carriers want access to municipal assets (streetlight poles, buildings) to install antennas. Though advanced wireless networks are attractive to any modern city, a careful balance between municipal and industry interests are important considerations. By participating in the review, The City has helped shape and influence the legislative outcomes.

2019 Status Update: The following represents recent communication from the legislative review panel.

2019 June 26: The Broadcasting and Telecommunications Legislative Review expert panel released their findings in a paper called “What We Heard Report”. It’s important to note that **no large cities** were interviewed as part of the process.

2020 January 31: The expert panel is scheduled to release their final report to the Federal Government.

Advocacy and regulatory participation remain a high priority of the Fibre Infrastructure Strategy to protect municipal interests.

One Calgary (2019- 2022) Capital Budget

Due to the current economic situation, the One Calgary (2019-2022) capital budget was significantly decreased compared to the Action Plan (2015-2018) budget.

An approved capital budget for One Calgary (2019-2022) of \$4 million was increased to \$8 million by Council at the 2019 November Adjustment to One Calgary Service Plans and Budgets. In comparison, the Action Plan (2015-2018) capital budget was \$20 million.

The current 2019- 2022 capital budget of \$8 million is funded entirely from the IT Reserve which is sourced from fibre revenues and recoveries. In this cycle, the Fibre Infrastructure Strategy will not achieve all of its objectives at the same rate seen in the 2015-2018 period. Revenue is expected to flatline with only modest growth as not all opportunities can be pursued. Fibre builds to City facilities and assets (traffic controllers) will be prioritized and will not achieve the same rate of connectivity.

Under these constraints, it is unlikely that self-funding of the Fibre Infrastructure Team can be achieved as forecasted in the 2015 strategy.

Essentially, the Fibre Infrastructure Team will be operating in a similar manner before this Council-approved strategy where additional funding was realized in 2015 to 2018. Though this is not ideal, the momentum and accomplishments over the last budget cycle have resulted in considerable gains.

In the 2019-2022 budget cycle, the Fibre Infrastructure Team will continue to focus on:

- a. Leveraging capital projects such as Greenline, Bus Rapid Transitway's Airport Trail, etc.
- b. Collaborating with stakeholders such as Transportation, Water, Facility Management, Integrated Civic Facilities, CPS, Calgary 911, Planning and Development, RE&DS and ENMAX.
- c. Pursuing alternate funding sources such as grants or joint builds.
- d. Establishing partnerships to leverage opportunities to expand the fibre plant or generate additional revenues through technology advancements like 5G, automated meter reading, smart city applications, etc.
- e. Reducing deployment costs by leveraging ENMAX's utility pole infrastructure.
- f. Promoting and marketing dark fibre through speaking engagements.

Works Cited

Government of Canada Innovation, Science and Economic Development Canada and Canadian Heritage, "*Government of Canada launches review of Telecommunications and Broadcasting Acts*", <https://www.canada.ca/en/canadian-heritage/news/2018/06/government-of-canada-launches-review-of-telecommunications-and-broadcasting-acts.html>, (June 5, 2018).

Government of Canada Innovation, Science and Economic Development Canada, Broadcasting and Telecommunications Legislative Review, "*What We Heard Report*", <https://www.ic.gc.ca/eic/site/110.nsf/eng/00011.html>, (June 2019).