CORPORATION OF THE CITY OF
CLARENCE-ROCKLAND
COMMITTEE OF THE WHOLE

September 16, 2019, 8:00 pm
Council Chambers
415 rue Lemay Street, Clarence Creek, Ont.

Pages

1. Opening of the meeting

2. Adoption of the agenda

3. Disclosure of pecuniary interests 5

4. Delegations / Presentations

5. Petitions / Correspondence

   5.1 City of Kitchener's resolution regarding consumer packaging on single-use wipes 7

   5.2 Proclaim Waste Reduction Week 9

6. Notice of Motion

   6.1 Notice of motion presented by Councillor Michel Levert and supported by Mayor Guy Desjardins to support Mr. Alain Lalonde's application to obtain a license to sell LCBO products in a convenience store located at 3150 Gendron Road

   BE IT RESOLVED THAT the Council of the City of Clarence-Rockland hereby support Mr. Alain Lalonde's application to obtain a license to sell LCBO products in a section of his convenience store located within the limits of the City of Clarence-Rockland, more specifically at 3150, Gendron Road in Hammond.

7. Comment/Question Period

Note: Members of the public may come forward to the podium and after seeking permission from the Presiding Officer, shall state their name and direct their question/comment on any matter which is related to any item included in this agenda to the Presiding Officer.

The maximum time allowed in all circumstances for a question/comment shall be three (3) minutes per person per meeting. There shall be a maximum of 30 minutes dedicated to the question/comment period. Any unasked questions/comments due to the time restriction may be submitted in writing to the Clerk.

At no time shall this question period be taken by members of the audience to make speeches or accusations.

8. Report from the United Counties of Prescott and Russell

9. Committee/Staff Reports

10. Other items

11. Adjournment

CORPORATION DE LA CITÉ DE
CLARENCE-ROCKLAND
COMITÉ PLÉNIER

le 16 septembre 2019, 20 h 00
Council Chambers
415 rue Lemay Street, Clarence Creek, Ont.

Pages

1. Ouverture de la réunion

2. Adoption de l'ordre du jour

3. Déclarations d'intérêts pécuniaires 5

4. Délégations / Présentations

5. Pétitions / Correspondance

   5.1 Résolution de la Cité de Kitchener concernant les emballagesde consommation sur les lingettes à usage unique 7

   5.2 Proclamation de la semaine de réduction des déchets 9

6. Avis de motion

   6.1 Avis de motion présenté par le conseiller Michel Levert et appuyé par le maire Guy Desjardins pour appuyer la demande de M. Alain Lalonde pour l'obtention d'une section de vente des produits LCBO à l'intérieur de son dépanneur situé au 3150 rue Gendron

   QU'IL SOIT RÉSOLU QUE le conseil municipal de la Cité de Clarence-Rockland appui la demande de M. Alain Lalonde pour l'obtention d'une section de vente des produits LCBO à l'intérieur de son dépanneur situé dans les limites de la Cité de Clarence-Rockland, soit plus précisément au 3150, chemin Gendron à Hammond.

7. Période de Questions/Commentaires

Note: Les membres du public sont invités à se rendre au podium et après avoir reçu la permission du président de l'assemblée, doivent se nommer et adresser leur question et/ou commentaire sur tout sujet qui est relié à n'importe quel item qui figure à l'ordre du jour au président de réunion.
Le temps maximal accordé pour une question/commentaire dans toutes circonstances est de trois (3) minutes par personne par réunion. Il y aura un maximum de 30 minutes consacrés à la période de questions/ commentaires. Toutes questions et/ou commentaires qui n'ont pas été adressés par faute de temps peuvent être soumis par écrit à la greffière.
En aucun cas, cette période de questions/ commentaires ne peut être utilisée par les membres du public pour faire des discours ou porter des accusations.

8. Rapport des Comtés unis de Prescott et Russell

9. Rapports des Comités/Services

10. Autres items

11. Ajournement

Declaration of pecuniary interest
Déclaration d'intérêt pécuniaire

Date of meeting Date de la réunion:	
Item Number Numéro de l'item:	
Subject of the item: Sujet de l'item :	
Name of Council Member Nom du membre du conseil	

I, _____, hereby declare a pecuniary interest in the matter identified above for the following reason :

Je, _____, déclare un intérêt pécuniaire en ce qui concerne l'article ci-haut mentionné, pour la raison suivante :

Name (print)	Signature	Date

This declaration is filed in accordance with the *Municipal Conflict of Interest Act* and will be recorded in the meeting minutes and will be made available in a public registry. / Cette déclaration est soumise sous la *Loi sur les conflits d'intérêt municipaux* et sera enregistrée dans le procès-verbal de la réunion et sera disponible dans un registre public.

Excerpt from the Municipal Conflict of Interest Act, R.S.O. 1990, c. M.50

DUTY OF MEMBER

When present at meeting at which matter considered

5 (1) Where a member, either on his or her own behalf or while acting for, by, with or through another, has any pecuniary interest, direct or indirect, in any matter and is present at a meeting of the council or local board at which the matter is the subject of consideration, the member,

(a) shall, prior to any consideration of the matter at the meeting, disclose the interest and the general nature thereof;

(b) shall not take part in the discussion of, or vote on any question in respect of the matter; and

(c) shall not attempt in any way whether before, during or after the meeting to influence the voting on any such question. R.S.O. 1990, c. M.50, s. 5 (1).

Where member to leave closed meeting

(2) Where the meeting referred to in subsection (1) is not open to the public, in addition to complying with the requirements of that subsection, the member shall forthwith leave the meeting or the part of the meeting during which the matter is under consideration. R.S.O. 1990, c. M.50, s. 5 (2).

Extrait de la Loi sur les conflits d'intérêts municipaux, L.R.O. 1990, chap. M.50

OBLIGATIONS DU MEMBRE

Participation à une réunion où l'affaire est discutée

5 (1) Le membre qui, soit pour son propre compte soit pour le compte d'autrui ou par personne interposée, seul ou avec d'autres, a un intérêt pécuniaire direct ou indirect dans une affaire et participe à une réunion du conseil ou du conseil local où l'affaire est discutée, est tenu aux obligations suivantes :

a) avant toute discussion de l'affaire, déclarer son intérêt et en préciser la nature en termes généraux;

b) ne pas prendre part à la discussion ni voter sur une question relative à l'affaire;

c) ne pas tenter, avant, pendant ni après la réunion, d'influencer de quelque façon le vote sur une question relative à l'affaire. L.R.O. 1990, chap. M.50, par. 5 (1).

Exclusion de la réunion à huis clos

(2) Si la réunion visée au paragraphe (1) se tient à huis clos, outre les obligations que lui impose ce paragraphe, le membre est tenu de quitter immédiatement la réunion ou la partie de la réunion où l'affaire est discutée. L.R.O. 1990, chap. M.50, par. 5 (2).

CHRISTINE TARLING
Director of Legislated Services & City Clerk
Corporate Services Department
Kitchener City Hall, 2nd Floor
200 King Street West, P.O. Box 1118
Kitchener, ON N2G 4G7
Phone: 519.741.2200 x 7809 Fax: 519.741.2705
christine.tarling@kitchener.ca
TTY: 519-741-2385

September 5, 2019

Dear Municipal Colleagues:

This is to advise that City Council, at a meeting held on August 26, 2019, passed the following resolution regarding single-use disposable wipes:

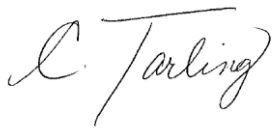
> "WHEREAS in 2018 the City of Kitchener implemented a sustainable funding model Water Infrastructure Project (WIP) for the city's water, sanitary and stormwater infrastructure to ensure the safe delivery of these valued utilities; and,
>
> WHEREAS in 2018 a multi-year initiative approved through the WIP has already improved several key measures of water quality, and proactive maintenance has reduced the risk of flooding in high-risk areas; and,
>
> WHEREAS in 2018 the City has already seen a number of impacts due to the implementation of the WIP including: 48% decrease in complaints related to discoloured water; Storm main repairs increased by 27 per cent; 300 metric tonnes of sediment removed from catch basins; and, 2,200 properties protected against backflow and cross-connection contamination; and,
>
> WHEREAS Single-use wipes are a $6-billion industry and growing, and are now being advertised as the clean alternative to toilet paper and are safe to flush; and,
>
> WHEREAS there is no one standard for what the word "flushable" means; and,
>
> WHEREAS Single-use wipes are in fact not safe to flush as they are buoyant; are not biodegradable; and, are unable to break down into small pieces quickly; and,
>
> WHEREAS Single-use wipes accumulate in the sewer system and eventually clog the sanitary sewer system costing municipalities hundreds of millions of dollars in additional repairs and maintenance costs each year to municipal sewer systems across the country; and,

WHEREAS there is a lack of public awareness of the impact caused by non-flushable wipes being flushed down toilets and consumer education and outreach could play a large part in reducing the impact;

THEREFORE BE IT RESOLVED that the City of Kitchener lobby the Federal Government, to review regulations related to consumer packaging on single-use wipes to remove the word flushable; and,

BE IT FINALLY RESOLVED that this resolution be forwarded to the Right Honourable Prime Minister of Canada; the Honourable Premier of Ontario; the Minister of the Environment, Conservation and Parks; the Minister of Municipal Affairs and Housing; the Association of Municipalities of Ontario; the Local Members of Provincial Parliament; the Region of Waterloo; and, all Municipalities within the Province of Ontario."

Yours truly,



C. Tarling
Director of Legislated Services
& City Clerk

Monique Ouellet

From: Waste Reduction Week in Canada <info@wrwcanada.com>
Sent: September-11-19 11:37 AM
To: Monique Ouellet
Subject: Proclaim Waste Reduction Week 2019

Proclaim Waste Reduction Week

October 21-27, 2019

Recycling Council of Ontario

WASTE REDUCTION WEEK IN CANADA

Think Global and Act Local

Celebrate Environmental Achievements and Commitments of Your Community!

Countdown to #WasteReductionWeek 2019

39 DAYS 10 HOURS 44 MINUTES 51 SECONDS

Powered by MotionMail ©

Canadian municipalities and First Nations are at the heart of Canada's waste reduction achievements. Today's coalescing environmental challenges – resource scarcity, plastic pollution, climate change, and waste generation– require continued leadership of our community champions.

Waste Reduction Week in Canada is a national year-round program that focuses on the transformation to a circular economy driven by resource efficiency. Our purpose is to promote individual and collective environmental

commitments, efforts, and accomplishment while encouraging innovative ideas and solutions.

Held annually during the third week of October since 2001, Waste Reduction Week in Canada, through a coalition of environmental non-profit and government organizations from across Canada, shines the spotlight on conscious consumption and responsible recycling.

This year we once again ask municipalities and First Nations to join businesses, schools, and individuals from across Canada to renew their commitment and celebrate sustainability by proclaiming **Oct. 21 – 27, 2019** as Waste Reduction Week in Canada.

By thinking globally and acting locally we embrace the Waste Reduction Week in Canada call to action. Each year more than 100 communities across Canada proclaim Waste Reduction Week in Canada and with your support we can increase that amount in 2019.

We hope your council and senior leaders will take this opportunity to join a widely recognized and successful national environmental campaign and show your support.

How to Proclaim

- **Download** the proclamation and include your logo and/or seal on the bottom right. You are welcome to use your own certificate template instead, if desired.
- **Visit** wrwcanada.com/proclamations, complete the form, and upload the completed certificate. You may also email your completed certificate to info@wrwcanada.com.
- **Share your achievements and commitments:** either on the form or in an email, provide us with details of your waste reduction past achievements and future commitments including new or innovative projects, programs, or partnerships. One of the important objectives of Waste Reduction Week is to facilitate sharing between all of our participants.

Once submitted your proclamation will be featured on wrwcanada.com within 1-3 business days and posted on social media using the hashtag **#WasteReductionWeek**. In doing so, fellow Canadians, First Nations, schools, organizations, and

businesses across Canada will view and appreciate your support and commitment to waste reduction, recycling, and the environment.

PROCLAIM NOW!

Additonal Ways to Involve Your Community

If you are not the representative that plans waste reduction and communications activities for your community, please pass this message along to the correct department/representative.

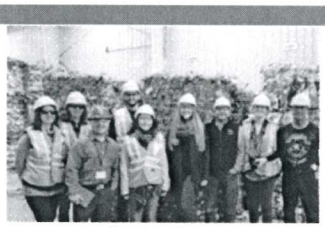
Host an Event

Organizing an event during Waste Reduction Week in Canada is an excellent way to showcase your proclamation and engage your community in the 3Rs and circular economy. Popular events include:

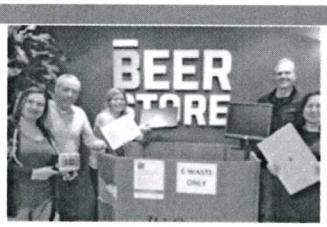
- Clothing swaps (Coming Soon! We will be launching the *SwapIt Toolkit*, a step-by-step resource for organizing a clothing swap)
- Repair events
- Waste-free lunches in schools and offices
- Waste collection drives such as hazardous waste, textiles, or electronics
- Documentary screenings & information sessions
- Recycling facility tours
- Public installations

Don't forget to register your event online so we can help with promotion.

REGISTER AN EVENT

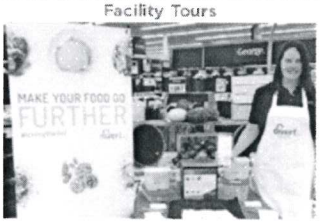


Facility Tours

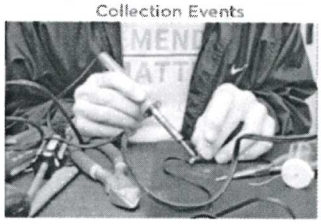


Collection Events

Swap Events



Education/Outreach Events



Repair Events

Shoreline & Community Cleanups

Landmark Lightings

Last year, 15 landmarks across Canada lit blue and green for Waste Reduction Week. We encourage municipalities to help us create awareness by lighting a local landmark or municipal building blue and green for Waste Reduction Week.

Let the rest of Canada know about your lighting by registering it at wrwcanada.com/events.

Promotion

Theme days

In 2017 we introduced six issue-specific days during Waste Reduction Week in Canada, with each selected for its importance to Canadians and the economy to leverage and highlight the work we are collectively accomplishing. The themes also offer focus for participants planning events, social media campaigns, and resources.

Social Media

Support Waste Reduction Week in Canada using hashtag #WasteReductionWeek in communications. Share ideas, stories, and pictures of waste reduction initiatives to demonstrate commitment to reducing waste both at home and in the community.

Follow @WRWCanada on social media!

Promotional materials

Promotional materials and assets are available at wrwcanada.com/promotional-resources. More materials such as sample social media posts and a promotional poster will be available throughout September.

Visit wrwcanada.com for more campaign details and resources.

Become a Sponsor

Our initiative is a funded solely through those that believe in its objectives and is directed to developing and improving all of its resources and tools free to charge to all its participants and supports. If your community is interested in further leveraging the values of Waste Reduction Week in Canada please consider becoming a sponsor.

Opportunities that align specifically with our themes are available, as well as unique packages that can be customized to work alongside your area of interest.

By joining us we can support and showcase your community as a leader, champion, and innovator in waste reduction and recycling to a captivated national audience.

Don't let this exciting opportunity go to waste! Contact the Waste Reduction Week in Canada team to get started.

Thank You

Canadians are proud of their natural environment and understand the value of protecting our resources. Campaigns like Waste Reduction Week in Canada play an important role in reminding us to conserve and maintain a lifestyle that helps to preserve them. Your support will help inspire individuals and other communities to mobilize and take action.

We appreciate your commitment to the environment and for proclaiming Waste Reduction Week in Canada.

Yours sincerely,

Jo-Anne St. Godard
Executive Director
Recycling Council of Ontario
416.657.2797, ext. 3
info@wrwcanada.com

About Recycling Council of Ontario

Since 1978 RCO has worked closely with municipalities and businesses across Ontario to inform and educate all members of society about the generation of waste, the avoidance of waste, the more efficient use of resources, and the benefits and/or consequences of these activities. We also run programs that support waste reduction goals.

Take Back the Light can help municipalities recover and recycle spent lights, whether they are generated through relighting, on-going maintenance, or facility retrofits. The program also works with organizations that recycle lights outside their purchase arrangements, and accepts lights and light fixtures in all quantities. Every light is tracked, and 98 per cent each light collected is diverted from disposal with component parts reused wherever possible. Visit www.TakeBacktheLight.ca to learn more.

3RCertified is a unique program that reviews how organizations manage solid waste reduction and diversion operations. Participating facilities achieve certification levels based on established criteria and third-party evaluation of waste management and reduction practices. Visit www.3RCertified.ca to learn more.

Recycling Council of Ontario

WASTE REDUCTION WEEK IN CANADA

Waste Reduction Week in Canada | info@wrwcanada.com | wrwcanada.com

STAY CONNECTED!

REPORT N° CLERK2019-12

Date	16/09/2019
Submitted by	Monique Ouellet, Clerk
Subject	Surplus Property – 1954 Claudette
File N°	

1) **NATURE/GOAL :**
The purpose of this report is to recommend that Council declare the property described as 1954 Claudette Drive to be surplus to the needs of the municipality and to authorize that the property be sold.

2) **DIRECTIVE/PREVIOUS POLICY :**
n/a

3) **DEPARTMENT'S RECOMMENDATION:**

WHEREAS By-law 2004-153 provides the procedures for disposing of surplus property; and

WHEREAS further to a consultation with all department heads, the administration recommends that the property known as 1954 Claudette Drive be declared surplus to the needs of the City;

BE IT RESLOVED THAT Council hereby declares the property known as 1954 Claudette Drive to be surplus to the needs of the City; and

BE IT FURTHER RESOLVED THAT Council hereby authorizes the Clerk and/or the Treasurer to proceed to the sale of the surplus property identified as 1954 Claudette Drive as per the policy adopted under By-law 2004-153.

ATTENDU que le Règlement 2004-153 énonce les procédures pour disposer des biens excédentaires, et

ATTENDU que suite à une consultation avec tous les chefs de départements, l'administration recommande que la propriété connue comme le 1954, promenade Claudette soit déclarée bien excédentaire aux besoins de la Cité;

QU'IL SOIT RÉSOLU QUE le Conseil déclare la propriété connue comme le 1954, promenade Claudette, bien excédentaire aux besoins de la Cité; et

QU'IL SOIT AUSSI RÉSOLU QUE le Conseil autorise la Greffière et/ou le Trésorier à procéder à la vente de la propriété identifiée

comme le 1954, promenade Claudette sujet à suivre la politique adoptée par le Règlement no. 2004-153.

4) **BACKGROUND :**
n/a

5) **DISCUSSION :**
This property, known as 1954 Claudette Drive was transferred to the City as a condition of a plan of subdivision in 1992. It was later determined by Community Services that, at this time, the land is not required at that location as there is a park available in proximity to this development. No future development is proposed in that area in the near future. If any development is proposed in that area in the upcoming years, the developer will need to provide a suitable piece of land for park development.

6) **CONSULTATION:**
Directors have been consulted and no objections were identified.

7) **RECOMMENDATIONS OR COMMENTS FROM COMMITTEE/ OTHER DEPARTMENTS :**
n/a

8) **FINANCIAL IMPACT (expenses/material/etc.):**
As per section 42 of the Planning Act all sale proceeds will be deposited in the Parkland Reserve.

9) **LEGAL IMPLICATIONS :**
n/a

10) **RISK MANAGEMENT :**
n/a

11) **STRATEGIC IMPLICATIONS :**
n/a

12) **SUPPORTING DOCUMENTS:**
- Key map

1954 CLAUDETTE – TERRAIN POUR FIN DE PARC

REPORT N° INF2019-027

Date	06/09/2019
Submitted by	Julian Lenhart
Subject	Poupart Road Safety Assement
File N°	

1) **NATURE/GOAL :**
The nature of this report is to provide recommendations to Council to improve the safety of Poupart Road.

2) **DIRECTIVE/PREVIOUS POLICY :**
At the June 17th Council meeting, Council directed staff to assess the road condition and provide recommendations to improve the safety of Poupart Road.

3) **DEPARTMENT'S RECOMMENDATION :**
THAT Committee of the Whole recommends that Council approves the installation of additional warning signs as recommended in report INF2019-027.

QUE le comité plénier recommande au Conseil d'approuver l'ajout de panneaux d'avertissement supplémentaires recommandés dans le rapport INF2019-027.

4) **BACKGROUND :**
Members of Council received complaints about the safety of Poupart Road. As a result of these complaints, at the June 17th Council meeting, Council directed staff to assess the road condition and provide recommendations to improve the safety of Poupart Road. Following this direction, staff conducted a visual inspection of Poupart Road and reviewed road safety and signage best practices. The recommendations contained in this report are made based on the findings of this review.

5) **DISCUSSION :**
The aim of the visual inspection, was to assess the existing features of Poupart Road and to better understand the safety hazards caused by these features. Below are the features that staff inspected;

- Road length,
- Road and shoulder width,
- Ditch side slopes,
- Horizontal curve length,

- Speed limits,
- Existing signage,

Road length

Poupart Road spans approximately 1.7 km from St-Jean Street to Laurier Street. The 90-degree curve is located at 0.7 km from Laurier Street and 1.0 km from St-Jean.

Road and shoulder width

The road and shoulder widths are narrow to very narrow in some places. The road width ranges between 6.0m to 5.5m and the shoulder width is less than 0.5m. A typical road and shoulder width for this type of road is 7.0m minimum road width and 1.0m to 0.5m minimum shoulder width.

Ditch side slopes

The ditch side slopes are very steep in most cases the side slopes are less than 3:1.

Horizontal curve length

The existing curve length of the 90 degree curve is approximately 60m however, the minimum curve length should be 3 times the speed limit. This means that the curve length should be 150m for a 50 km/h speed limit.

Speed limit

The posted speed limit throughout Poupart Street is 50 Km/h including through the 90 degree curve.

Existing road signage

Poupart Road has a sharp curve ahead warning sign and a sharp bend danger slow down sign posted in both directions. It must be noted, that even though the existing signage is limited, the existing signage meets the provincial standards. (Example of signs shown below)

In order to establish best practices, staff consulted the Highway Design Manual. The Department's recommendations are based on these best practices. The focus area of the improvements are listed below.

- Speed limits/ Horizontal curve length
- Increase warning signage

Speed limits/Horizontal curve length

Based on the curve length of 60m, the maximum safe speed for the curve is 20Km/h. The Department therefore, recommends to lower the speed limit, through the curve section only, to 20Km/h. This will be a warning sign not a regulatory sign and it will be posted under the curve warning sign.

Increase warning signage

The Department recommends to add a maximum safe speed of 20 km/h for a curve sign below the sharp curve ahead warning sign. (Example of this sign shown below)

The department further recommends to add chevron arrow head signs through the curve to help guide drivers along the sharp curve. (Example of this sign shown below)

6) **CONSULTATION:**
N/A

7) **RECOMMENDATIONS OR COMMENTS FROM COMMITTEE/ OTHER DEPARTMENTS :**
N/A

8) **FINANCIAL IMPACT (expenses/material/etc.):**
The cost for additional signs and posts will be absorbed by the Departments operating budget.

9) **LEGAL IMPLICATIONS :**
N/A

10) **RISK MANAGEMENT :**

The additional warning signage can reduce the risk of accidents.

11) **STRATEGIC IMPLICATIONS :**
N/A

12) **SUPPORTING DOCUMENTS:**
N/A

RAPPORT N° LOI2019-09-03

Date	16/09/2019
Soumis par	Jean-Luc Jubinville
Objet	Mise à jour du plan de conservation d'énergie
# du dossier	P06-ESA

1) **NATURE / OBJECTIF :**
La mise à jour du plan de conservation d'énergie doit être approuvée par le conseil municipal. Le but de ce rapport est donc d'obtenir cette approbation.

2) **DIRECTIVE/POLITIQUE ANTÉCÉDENTE :**
Le premier plan de conservation d'énergie a été approuvé par le conseil municipal en juin 2014.

3) **RECOMMANDATION DU SERVICE:**

ATTENDU QUE selon la loi de 1998 sur l'électricité, la Cité est dans l'obligation de mettre à jour son plan de conservation d'énergie à tous les 5 ans;

QU'IL SOIT RÉSOLU que le conseil municipal approuve la mise à jour du plan de conservation d'énergie 2019-2024, rédigé par J.L. Richards et daté du 28 août 2019, tel que recommandé au rapport no. LOI2019-09-03.

WHEREAS as per the Electricity Act of 1998, the City is required to update its energy conservation plan every 5 years; and

BE IT RESOLVED that Municipal Council approves the update of the 2019-2024 Energy Conservation Plan, written by J.L. Richards and dated August 28, 2019; as recommended in report no. LOI2019-09-03.

4) **HISTORIQUE :**
En 2014, les Services communautaires en collaboration avec le service d'infrastructure et ingénierie ont engagé une firme de consultant afin de mettre en place un plan de conservation d'énergie pour l'ensemble des édifices municipaux.

Tel qu'indiqué dans la loi de 1998 sur l'électricité, ce plan doit être mise à jour à chaque 5 ans. Les Services communautaires ont donc

embauché une firme de consultant (J.L. Richards) au mois de juin afin de mettre à jour le document.

5) **DISCUSSION :**

Édifices impliqués :
Tous les édifices pour lesquels la Cité paye une facture d'électricité doivent être inclus dans le plan ce qui comprend :
- Les centres communautaires
- Les hôtels de ville
- Les arénas
- Les édifices de service (p.ex., garage, entrepôt)
- Les stations de pompage
- L'usine de purification des eaux
- Etc.

Lumière de rue :
Les lumières de rue font partie du plan dû au fait que la municipalité paye la facture d'électricité.

Durée du plan :
Le plan est d'une durée de 5 ans et devra donc être mise à jour de nouveau en 2024.

Mise en place :
Les services communautaires et le service d'infrastructure et ingénieries se consulteront afin de mettre en œuvre les recommandations mentionnées à l'intérieur du plan.

6) **CONSULTATION :**
N/A

7) **RECOMMANDATION OU COMMENTAIRES DU COMITÉ :**
N/A

8) **IMPACT FINANCIER (monétaire/matériaux/etc.):**
Le présent rapport n'a aucun impact financier direct. Chacune des recommandations retrouvées à l'intérieur du plan seront considérées individuellement lors des processus budgétaires.

9) **IMPLICATIONS LÉGALES :**
N/A

10) **GESTION DU RISQUE (RISK MANAGEMENT) :**
N/A

11) **IMPLICATIONS STRATÉGIQUES :**
N/A

12) **DOCUMENTS D'APPUI:**

- Clarence-Rockland ECDMP 2019-2024

Prepared for:

CITY OF CLARENCE-ROCKLAND
1560 Laurier St.
Rockland, ON K4K 1P7

Prepared by:

J.L. RICHARDS & ASSOCIATES LIMITED
864 Lady Ellen Place
Ottawa, ON K1Z 5M2

Tel: 613-728-3571
Fax: 613-728-6012

Clarence-Rockland

Energy Conservation and Demand Management Plan 2019-2024

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

August 28, 2019

JLR No.: 28835-000

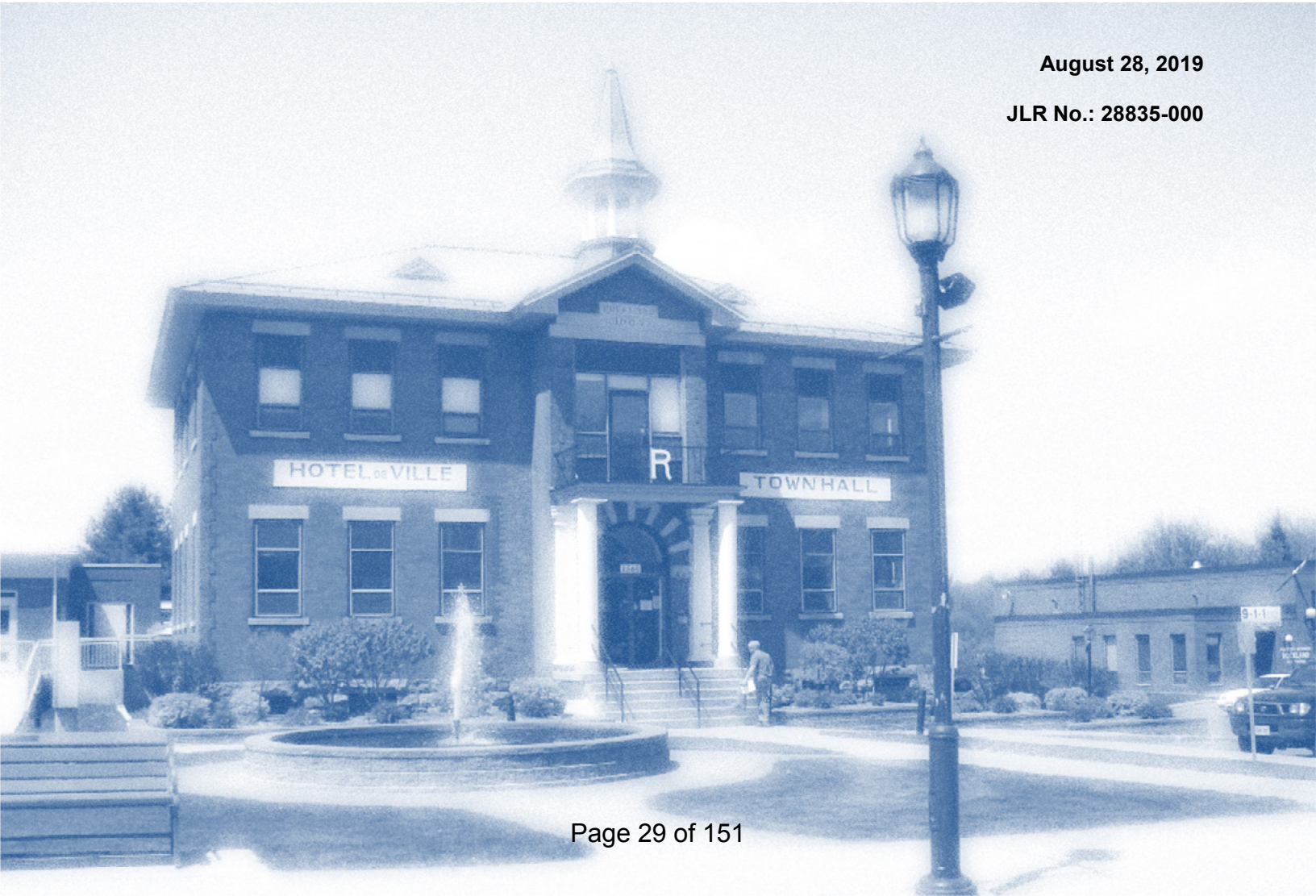


Table of Contents

1.0 Executive Summary

Context

Under O. Reg. 507/18 of the Electricity Act, the City of Clarence-Rockland is required to update their Energy Conservation and Demand Management Plan (the Plan) every 5 years. The purpose of this Plan is to provide the City with a picture of their facilities' current energy consumption, realistic and measureable targets to conserve energy, and actionable initiatives in order to achieve tangible energy reductions.

Ontario's 2017 Long Term Energy Plan estimates that electricity costs are expected to increase over 20%, or roughly 4% per year, over the next five years. The federal carbon tax has come into effect in 2019 at $20/tonne and will increase by $10/tonne each year until it reaches $50/tonne in 2022; the latter price will result in an 80% increase in the price of natural gas relative to 2019 costs. This further supports the need for Ontario municipalities to reduce their energy use.

Past Performance and Actions

The increase in the City's total energy consumption since 2012 is a result of additional facilities being built or purchased by the City. The decrease in greenhouse gas emissions (GHGs) is almost entirely associated with the greening of the Ontario electrical grid through the retirement of Ontario Power Generation's coal plants. The City has not seen the equivalent decrease in GHG emissions due to an increase in natural gas consumption and an overall increase in energy consumption.

All of the City's facilities performed reasonably well against the national median. 4 properties consume 52% of the City total energy consumption. Rockland's water and wastewater treatment plants are the largest energy consumers followed by the arenas in Clarence-Creek and Rockland (Jean-Marc Lalonde). Both of the plants consume more energy than the national median. As these facilities are also the City's greatest energy consumers, they should be the focus of energy efficiency initiatives.

Many of the actions identified in the previous Plan were not completed over the last five years due to a combination of budget cuts and limited bandwidth from City staff to take on new projects. The City does not currently generate any renewable energy.

City's Energy Management Practice Self-Assessment and Targets

The City's energy management practices from 2014 to 2019 have been self-assessed for this report. The levels have increased in commitment, planning, and organization. Training, communication, finance and projects have remained static since the 2014 plan.

The City's energy management vision remains unchanged since 2014 and is:

> *The City of Clarence-Rockland will approach energy management proactively. We will pursue energy solutions that will lead to environmental, societal and economic benefits.*

The following three energy management objectives are identified as areas to focus on in the upcoming five years:

> ***Projects:*** *Level 3 Practice*
> *Improve capacity to identify and develop energy efficiency opportunities, specifically in the context of scheduled capital renewal. Improved development of business case will help to navigate through the funding process.*

Communication: *Level 2 Practice*
Energy efficiency is promoted informally through the City's communication.

Training: *Level 2 Practice*
One city staff has received training in energy efficiency management practices.

The City's energy management policy also establishes targets for the next 5 and 10 years, expressed as a reduction in energy use intensity. The targets are measured against the benchmark year of 2012.

Target	Facilities	Plants	Streetlights
2024	0%	20%	56.8%
2029	4%	25%	56.8%

Identified Energy Initiatives

This Plan provides a list of potential specific energy efficiency projects the City can pursue in order to achieve their targets. This list includes simple projects such as installing programmable thermostats, to complex capital projects such as modernizing the refrigeration controls at the Clarence Creek Arena. There are general initiatives the City should pursue, such as conducting energy audits of major accounts (Clarence Creek and Jean-Marc Lalonde Arenas as well as sewer and water treatment plants), assessing the solar photovoltaic capacity for all City facilities, establishing a "revolving green fund" to finance future projects, and establishing an energy retrofit management program.

For each of the potential actions, the expected energy savings, the capital costs, the simple payback and greenhouse gas emissions reductions are provided. Possible funding opportunities that could reduce capital costs are identified but were not included in the payback calculation. Similarly, the cost of carbon, and its affect on future fuel price increases, have not been factored into simple payback. Both factors could improve payback.

There are several funding opportunities available for energy efficiency measures, which for a municipality, include the Federation of Canadian Municipalities, utility-managed electricity and gas savings programs. Furthermore, because a wide range of energy savings measures have financial returns, there is a new and growing industry of entities that provide third party financing for energy retrofits and renewable energy generation, and which might be a good mechanism for the municipality to use to improve their facilities and reduce future energy bills.

Expected Impact of Initiatives and Plan for Review

If the City pursues all of the energy initiatives for these facilities and plants, they will surpass their energy reduction target for 2024. This Plan is intended to be reviewed on an ongoing basis to reassess objectives and associated actions based on the output of the monitoring process. This annual review is intended to be conducted by the Energy Officer in the form of a short report.

2.0 Overview

2.1 Introduction

Under Ontario Regulation 507/18 of the Electricity Act, the City of Clarence-Rockland (the City) is required to develop and publish an Energy Conservation and Demand Management Plan (the Plan). This Plan has been structured to comply with each of the requirements specified in the regulation.

The City's senior management approved this Plan in early August 2019. The City's Council subsequently adopted this Plan at the September 4th, 2019 council meeting.

The City intends to revisit and update this Plan every five years, as required under the regulation. The City's Energy Officer has overall responsibility for the maintenance and implementation of this plan.

2.2 Plan Scope

This Plan seeks to update and improve upon the Energy Conservation and Demand Management Plan 2014 (the previous Plan) while meeting the City's obligations under O. Reg. 507/18. The purpose of this Plan is to provide the City with an energy picture of their facilities' current energy consumption, realistic and measureable targets to conserve energy and actionable initiatives in order to achieve tangible energy reductions. The scope of this Plan is specific to the energy consumption and associated greenhouse gas emissions of the City's facility buildings, water and sewer plants and street lighting (as displayed in Table 1). Energy consumption and greenhouse gases associated with the City's vehicle fleet are not included in this plan. This Plan does not include activities by the broader community within Clarence-Rockland's municipal boundary.

2.3 Plan Development

The City retained J.L. Richards & Associates Limited (JLR) to update the previous Plan through a competitive proposal process. JLR is a multidisciplinary practice offering services in all core engineering disciplines, architecture, planning and project management. JLR worked with the City's Energy Team to develop this Plan.

This Plan was created in four stages, by:

1. Reviewing the City's Energy Plan, reporting and initiatives;
2. Analyzing annual electricity, natural gas and heating oil consumption from 2011-2018;
3. Updating targets based on analysis and trends in energy consumption; and
4. Drafting this Plan to meet the energy reduction targets.

Accordingly, this Plan identifies the City's current energy management practices, its goals and objectives for improvement, specific actionable steps to achieve these goals, and a commitment to continually assess progress, revisit the contents of this Plan and make revisions as required.

Name	Address	Use	Floor Area (ft2)
Facilities			
Alphonse Carrière Community Center	3154 Gendron Street, Hammond	Community Centre	2,296
Ronald Lalonde Community Center	2564 St-Pascal Rd, St-Pascal	Community Centre	5,756
Bourget Community Center	19 Lavigne Rd., Bourget	Community Centre	10,686
Chamberland Center	1517 Laurier St, Rockland	Community Centre	2,128
Clarence Creek Arena	418 Lemay St., Clarence Creek	Indoor Ice Rink; Community Centre	35,165
Jean-Marc Lalonde Arena	1450 ave du Parc, Rockland	Indoor Ice Rink; Community Centre	41,171
Band Shell	1500 ave du Parc, Rockland	Cultural Facility	756
Arts and cultural Center	1500 ave du Parc, Rockland	Cultural Facility	1,430
Museum	687 Laurier, Rockland	Cultural Facility	6,879
Recreation Garage	2815 Chamberland, Rockland	Storage Facility	1,812
Municipal Garage	417 Lemay St, Clarence Creek	Storage Facility	6,297
Archives	2475 ch. St-Pascal, St-Pascal	Administrative Office	2,257
Rockland City Hall	1560 Laurier Street, Rockland	Administrative Office	10,626
Fire Department Admin Building	1536 Laurier Street, Rockland	Administrative Office	1,610
Rockland Fire Hall	1550 Laurier, Rockland	Fire Station	3,000
Clarence Creek Fire Hall	1484 Landry Street, Clarence Creek	Fire Station	2,400
Bourget Fire Hall	2163 Laval Street, Bourget	Fire Station	2,300
Clarence Creek City Hall	415 Lemay Street, Clarence Creek	Administrative Office	4,326
Bourget Train Station	139 Levis Street	Other	1,902
Water and Sewage			
Rockland Water Treatment Plant	125 Edwards Street, Rockland	Water Treatment	15,000
Rockland Water Booster Station	1441 Caron St., Rockland	Water Pumping	-
Water Tower 1	888 St-Joseph St., Rockland	Water Pumping	-
Water Tower 2	2340 Bouvier Rd., Clarence Creek	Water Pumping	-

Water Tower 3	205 Grand Tronc Road, Cheney	Water Pumping	-
Rockland Step Pump System	000 Edwards St., Rockland	Water Pumping	-
Rockland New Pumping Station	25 de la Berge St., Rockland	Water Pumping	-
Rockland Wastewater Treatment Plant	700 Industrial Road, Rockland	Sewage Treatment	30,000
Sewage Pumping Station 1	455 Notre Dame St., Rockland	Sewage Pumping	-
Sewage Pumping Station 2	St Jacques St., Rockland	Sewage Pumping	-
Sewage Pumping Station 3	2780 Chamberland St., Rockland	Sewage Pumping	-
Sewage Pumping Station 4	1797 Albert St., Rockland	Sewage Pumping	-
Sewage Pumping Station 5	210 Edwards St., Rockland	Sewage Pumping	-
Sewage Pumping Station 6	151 Laurier St., Rockland	Sewage Pumping	-
Sewage Pumping Station 7	871 Platinum St. Rockland	Sewage Pumping	-
Street Lighting			
Street Lights (9 accounts)	Various	Other	

Table 1: List of City's Facilities, Plants and Streetlights included in this Plan

2.4 Plan Structure

Details are presented under the following sections:

- Section 3 – Ontario's Energy Picture;
- Section 4 – Baseline Energy Use;
- Section 5 – Energy Consumption and Emissions;
- Section 6 – Conservation and Renewable Energy Measures;
- Section 7 – Current State of Energy Management;
- Section 8 – Energy Management Policy;
- Section 9 – Identified Energy Initiatives;
- Section 10 – Expected Impact of Initiatives;
- Section 11 - Plan for Review.

3.0 Ontario's Energy Picture

3.1 Energy Supply and Pricing Forecasts for Ontario

In 2018, Ontario had a total electricity supply mix of 147.6 terawatt-hours (TWh), including avoided energy use as a result of conservation. Looking forward, supply requirements are expected to increase by approximately 20% over the next fifteen years.

Electricity costs are expected to increase over 20%, or roughly 4% per year, over the next five years. This further supports the need for Ontario municipalities to carefully manage their electricity use. However, Ontario's 2017 Long-Term Energy Plan was prepared under the previous provincial government. The current provincial government has yet to announce when they will release a revised energy plan, which has resulted in uncertainty surrounding the future of Ontario electricity market.

Natural gas prices have returned to the pre-2014 historically low rates. Enbridge's April 2019 effective natural gas price is lower than the previous quarter, largely driven by the decrease in the commodity price. Although there are no reliable long-term forecasts for the North American natural gas commodity price, there is certainty the price of natural gas will be affected by the recently announced carbon tax. On April 1, 2019, the federal carbon tax backstop went into effect at $20 per tonne of greenhouse gas emissions. This will result in a 30% addition to the commodity price of natural gas in Ontario. Under this plan, the carbon tax will increase by $10/tonne each year until $50/tonne in 2022, resulting in an 80% increase in price relative to 2019 costs as shown in Figure 1.

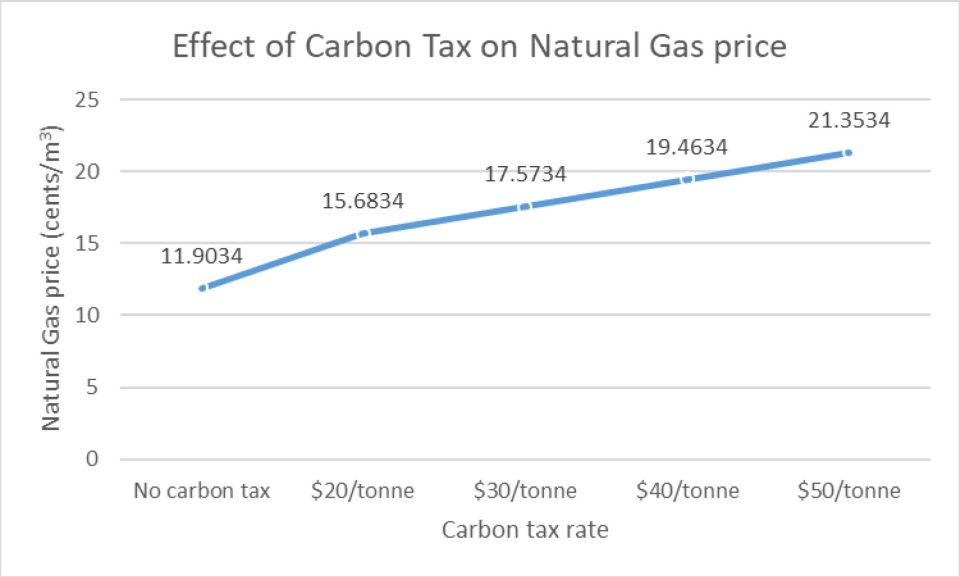


Figure 1: Projected Increase of Natural Gas Prices Due to Carbon Tax

Even though there is uncertainty surrounding the cost of electricity and natural gas over the next 10 years, energy sources powered by fossil fuels will undoubtedly increase as a result of the carbon tax.

3.2 Electricity Act and Regulation 507/18

On January 1, 2019 the current provincial government repealed the 2009 Green Energy Act which included O. Reg. 397/11: Energy Conservation and Demand Management Plans. However, the provincial government transferred the requirements of O. Reg. 397/11 to a new regulation O. Reg. 507/18: Broader Public Sector: Energy Reporting and Conservation and Demand Management Plans under the Electricity

Act. This regulation is intended to continue to help public agencies, including municipalities, understand and better manage their energy consumption. Under the regulation, the City is required to update their energy conservation and demand management plan every five years.

Energy conservation and demand management plans are required to include:

- A summary of the City's energy consumption and emissions;
- A description of previous, current and proposed energy conservation measures;
- A forecast of expected results for current and proposed measures;
- Cost and savings estimates for proposed measures;
- A report of the actual results achieved;
- A description of any proposed changes to be made to assist in reaching the targets set;
- A description of renewable energy generation facilities and their energy production;
- Details on the goals, objectives and proposed measures that have been developed; and
- Confirmation that this Plan has been approved by the City's senior management.

This Plan has been structured to comply with each of the requirements specified in the regulation.

4.0 Baseline Energy Use

The City developed an energy baseline of total annual energy consumption in the previous Plan in order to provide a quantitative reference case for comparing its future energy performance. Annual energy consumption of electricity, natural gas and fuel oil for 2012 were combined into an equivalent energy consumption value represented as an equivalent kilowatt hour (ekWh). The previous Plan then set targets based on an energy reduction relative to this 2012 baseline.

JLR would like to note that using *total annual energy consumption* of the City as the benchmark to which targets for future years are measured against can result in the City unfairly missing their targets due to expansion or increased use of facilities that are out of their control. For example, if the City constructs a new fire hall, the *total energy consumption* of the City will increase due to this new load regardless of energy efficiency measures enacted at other facilities. If this new fire hall were designed as a net-zero facility, this bold initiative in energy leadership would not be properly reflected in a target that uses the *total energy consumption*. Similarly, if the water or sewage flow through the treatment plants increased due to reasons out of the City's control, the energy consumption at these plants would increase substantially. For these reasons, this Plan will provide alternative benchmarks that will take into account expansion or increased usage, and will be detailed separately for facilities, plants and street lighting, as explained in the next three sections. The benchmarks will be measured using energy use intensity (EUI), which normalizes energy use of facilities of different sizes to a common metric such as floor area or flow. Generally a low EUI signifies good energy performance.

4.1 Facilities Benchmark

We define facilities as all buildings except for those associated with water and wastewater buildings. For this analysis, the benchmark energy consumption of the facilities was normalised to the gross floor space. The normalized energy consumption is known as gross energy use intensity (EUI_F):

$$EUI_F = \frac{Total\ Annual\ Energy\ Consumption\ for\ All\ Facilities}{Gross\ Floor\ Space\ of\ All\ Facilities}$$

EUI is a commonly used metric to express a building's energy use as a function of its size which allows for additional facilities to be constructed or acquired by the City without negatively effecting their energy reduction targets. Generally a low EUI signifies good energy performance. Using this metric for benchmarking and targeting, rather than absolute energy consumption, allows for new facilities to be constructed by the City and will demonstrate the reduction in energy consumption due to energy efficiency projects or net zero new construction.

Table 2 displays the total floor area, electricity, natural gas, fuel oil and equivalent energy consumption for 2012 of all of the City's non-water or sewage related buildings.

Account	Total Floor Area (m²)	Electricity (kWh)	Natural Gas (m³)	Fuel Oil (L)	Energy Consumption (ekWh)
Archives	210	13,440			13,440
Clarence-Creek Arena	3,267	624,420	17,201		807,228
Jean-Marc Lalonde Arena	3,825	180,960	48,620		697,683
Band Shell	70	14,595			14,595
Bourget Community Center	993	11,924			11,924
Bourget fire hall	214	37,457	2,743		66,609
Rockland City Hall	987	227,430	21,933		460,529
Rockland fire hall	279	29,284	5,263		85,218
Fire Department Admin Building	150	11,195			11,195
Alphonse Carrière Community Center	213	25,187			25,187
Ronald Lalonde Community Center	535	57,503			57,503
Arts and Cultural Center	133	14,595			14,595
Chamberland Center	198	50,576	2,372		75,785
Clarence Creek fire hall	223	19,126	4,130		63,019
Municipal Garage	585	142,180	2,702		170,896
Recreation Garage	168	70,500			70,500
Museum	639	23,490		6,929	98,169
Total	**12,688**	**1,553,862**	**104,964**	**6,929**	**2,744,075**

Table 2: City's Facilities Total Floor Area and 2012 Energy Consumption

The gross floor area and total equivalent energy consumption for 2012 is used to set the EUI benchmark that targets will be measured against.

$$EUI_F = \frac{2{,}744{,}074\ \text{ekWh}}{12{,}688\ \text{m}^2} = 216\frac{\text{ekWh}}{\text{m}^2}$$

4.2 Plant Benchmarks

We define plants as all municipal buildings associated with the pumping or treatment of water and waste water. The energy consumption of plants is heavily dependent on the flow through these plants. In order to separate deviations in annual flow rates from improvements in plant energy efficiency, the benchmark for water and sewer pumping stations and treatment plants will be set as gross energy use intensity (EUIP):

$$EUI_P = \frac{Total\ Annual\ Energy\ Consumption\ for\ All\ Facilities}{Total\ Flow\ Rate\ through\ Water\ and\ Sewer\ Treatment\ Plants}$$[1]

EUI using flow rate is a commonly used metric for water and sewer plant energy consumption to account for operation of the plants. Generally a low EUI signifies good energy performance. Using this metric for benchmarking and targeting allows for the City to demonstrate the reduction in energy consumption due to energy efficiency measures independent of an increase in water consumption by the residents.

Table 3 displays the total flow rate, electricity, natural gas and equivalent energy consumption for 2012 of all of the City's water or sewage related buildings.

Account	Annual Flow (ML)	Electricity (kWh)	Natural Gas (m^3)	Energy Consumption (ekWh)
Rockland Water Treatment Plant	1,510.43	736,800	43,039	1,194,209
Rockland Water Booster Station	337.61	119,400	4,103	163,006
Rockland Water Tower 1	1,132.83	11,337		11,337
Rockland Water Tower 2	302.09	27,086		27,086
Rockland Water Tower 3	75.52	40,329		40,329
Rockland Wastewater Treatment Plant	1,252.81	907,200	26,080	1,184,372
Rockland Sewage Pumping Station 1	1,252.81	129,600		129,600
Rockland Sewage Pumping Station 2	626.40	102,000		102,000
Rockland Sewage Pumping Station 3	125.28	46,400		46,400
Rockland Sewage Pumping Station 4	125.28	38,000		38,000
Rockland Sewage Pumping Station 5	125.28	21,300		21,300
Rockland Sewage Pumping Station 6	125.28	16,600		16,600
Rockland Sewage Pumping Station 7	125.28	21,700		21,700
Total	**7,116.892**	**2,217,752**	**73,222**	**2,995,939**

Table 3: City's Plant 2012 Annual Flow and Energy Consumption

The flow rates through the sewer and water treatment plants and total equivalent energy consumption for 2012 is used to set the EUI benchmark that targets will be measured against.

$$EUI_P = \frac{2{,}995{,}939\ \text{ekWh}}{2{,}763\ \text{ML}} = 1{,}084\,\frac{\text{ekWh}}{\text{ML}}$$

[1] The flow through the pumping stations will flow through the treatment plants and as a result have been excluded from this calculation.

4.3 Street Lighting Benchmark

In order to allow for new developments and roads to be constructed in the City and the additional load of new streetlights not negatively affecting their energy reduction targets, the benchmark for street lighting is set as a ratio of energy consumption per light:

$$EUI_S = \frac{Total\ Annual\ Energy\ Consumption\ for\ All\ Streelights}{Total\ Number\ of\ Streetlights}$$

Using this metric for benchmarking will encourage the adoption of energy efficient street lighting for future developments and roads.

Electricity Consumption (kWh)	Number of Streetlights
1,601,592	1,603

Table 4: City's 2012 Electricity Consumption and Quantity of Streetlights

The electricity consumption and number of streetlights for 2012 is used to set the ratio of energy consumption per light that will be used as a benchmark for targets to be measured against:

$$EUI_S = \frac{1{,}601{,}592\ \text{kWh}}{1{,}603\ \text{lights}} = 999\ \text{kWh/light}$$

5.0 Energy Consumption and Emissions

This section will provide an overview of the City's energy consumption and greenhouse gas emissions since the previous Plan, including an overview of the City's total energy consumption year over year, a comparison of energy consumption by fuel source, a breakdown of the different account types, a highlight of the City's largest energy consumers, an overview of individual facility's EUI and a year over year comparison against the benchmarks detailed in Section 4.0.

Figure 2 displays the City's combined equivalent energy consumption and the corresponding greenhouse gas emissions of all facilities from 2012 to 2018. Energy consumption is represented as equivalent kilowatt-hours, which is electricity as kilowatt-hours combined with natural gas and fuel oil converted to kilowatt-hours.

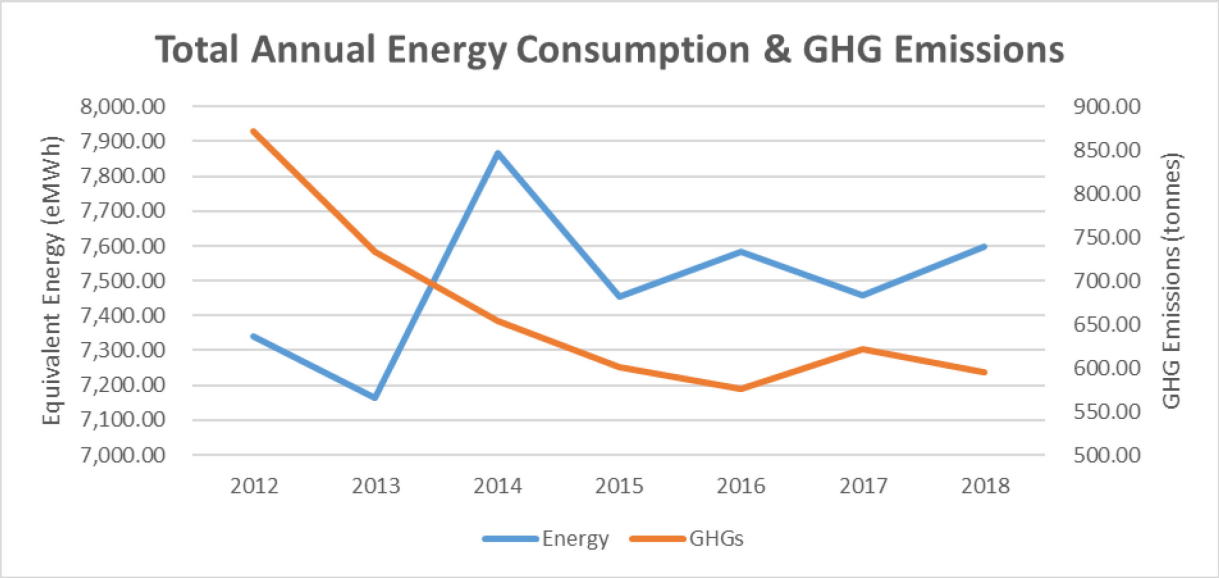


Figure 2: The City's Total Energy Consumption and Associated Greenhouse Gas Emissions of all Municipal Buildings and Streetlights from 2014 to 2018

The high energy consumption in 2014 is a result of abnormally high electric usage at the Clarence-Creek Arena. The increase in total energy consumption since 2012 is a result of additional facilities being built, purchased or the lease retained by the City such as Bourget Train Station, Clarence Creek City Hall and new water pumping stations in Rockland. The decrease in greenhouse gas emissions (GHGs) is almost entirely associated with the greening of the Ontario electrical grid through the retirement of Ontario Power Generation's coal plants. In 2012 the ratio of GHGs produced for electricity from the Ontario electrical grid was 100 g/kWh. By 2018 this ratio had decreased to 36 g/kWh. The City has not seen the equivalent decrease in GHG emissions due to an increase in natural gas consumption and an overall increase in energy consumption.

Figure 4 displays the City's energy consumption by fuel source for 2012 and 2018 (2012 data forms the inner ring, and 2018 data forms the outer ring). Electricity is the primary fuel source with natural gas and fuel oil used for space or process heating. The percentage increase in natural gas consumption in 2018 is due to fuel switching of a few facilities from electric heat or fuel oil to natural gas.

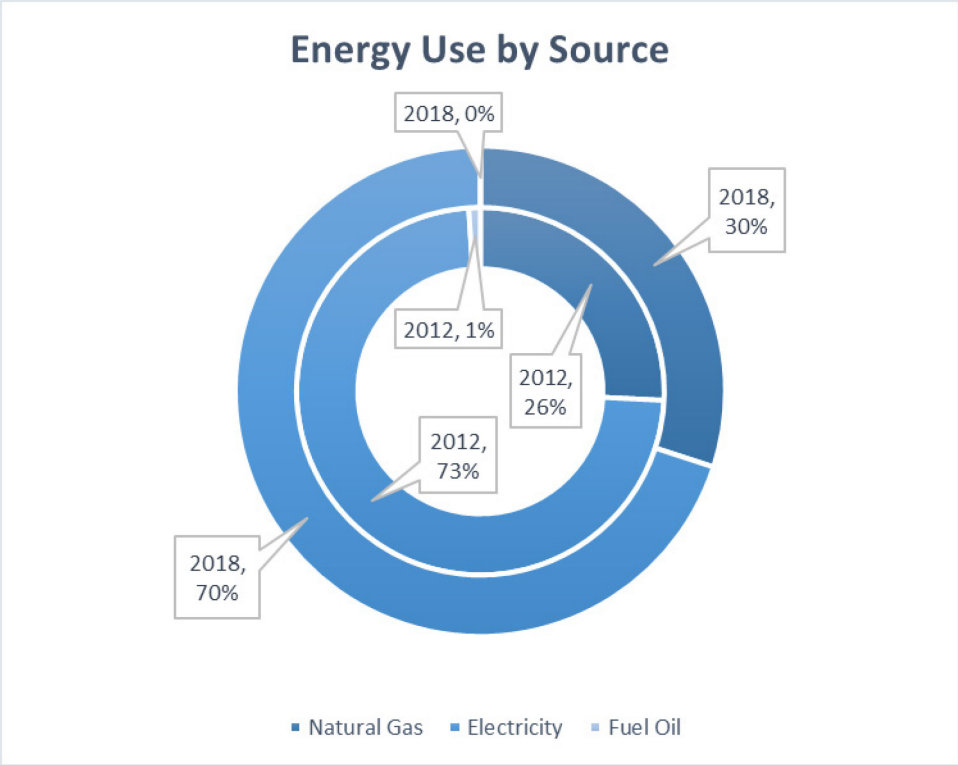


Figure 4: City's Total Energy Consumption by Fuel Source, 2012 Compared to 2018

Figure 3 displays the City's energy consumption by account centre categories for 2012 and 2018. Plants continue to be the largest account centre. Street lighting continues to be the smallest category and facilities has increase due to the new buildings constructed and acquired since 2012.

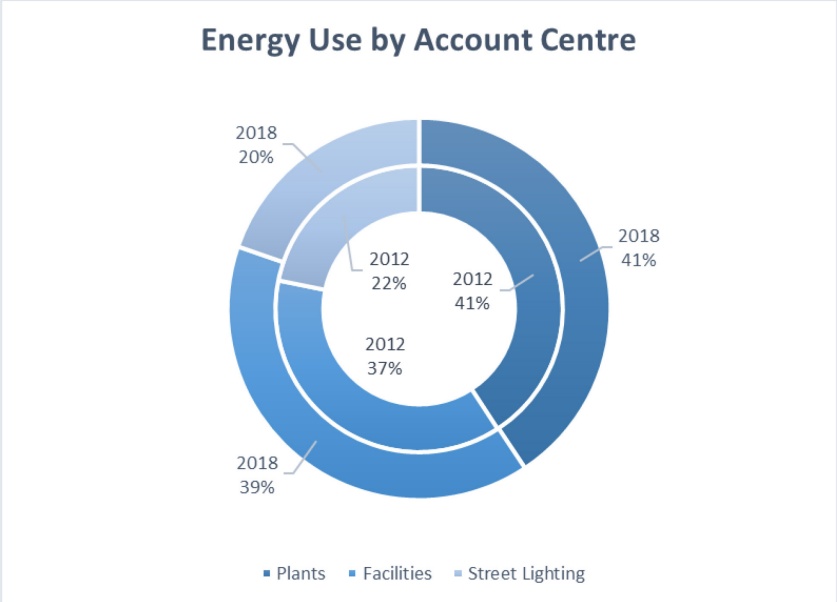


Figure 3: City's Total Energy Consumption by Account Centre Categories, 2012 Compared to 2018

Figure 5 highlights the City's largest energy consuming accounts in 2012 compared to 2018. The City's single largest account is street lighting. However, out of the combined 33 plants and facilities currently in use by the city, 4 properties consume 52% of the City total energy consumption. Rockland's water and wastewater treatment plants are the largest energy consumers followed by the arenas in Clarence-Creek and Rockland.

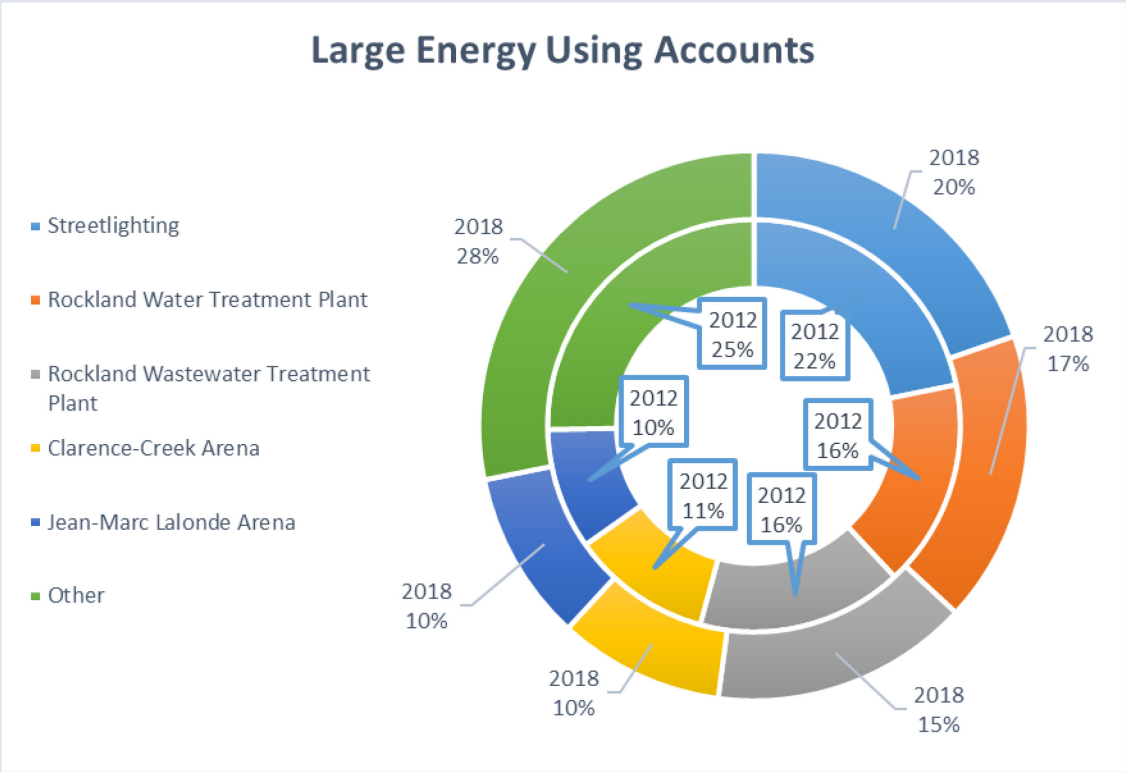


Figure 5: City's Largest Energy Using Accounts, 2014 Compared to 2018

Figure 6 displays the 2012 and 2018 energy use intensity for all of the City's facilities compared against the 2019 Energy Star® Portfolio Manager® Canadian National Median Site EUI for each property type. The median value is the middle of the national population – half of buildings use more energy, half use less. The facilities are ordered from lowest consumers (left) to highest consumers (right) when compared to the national median.

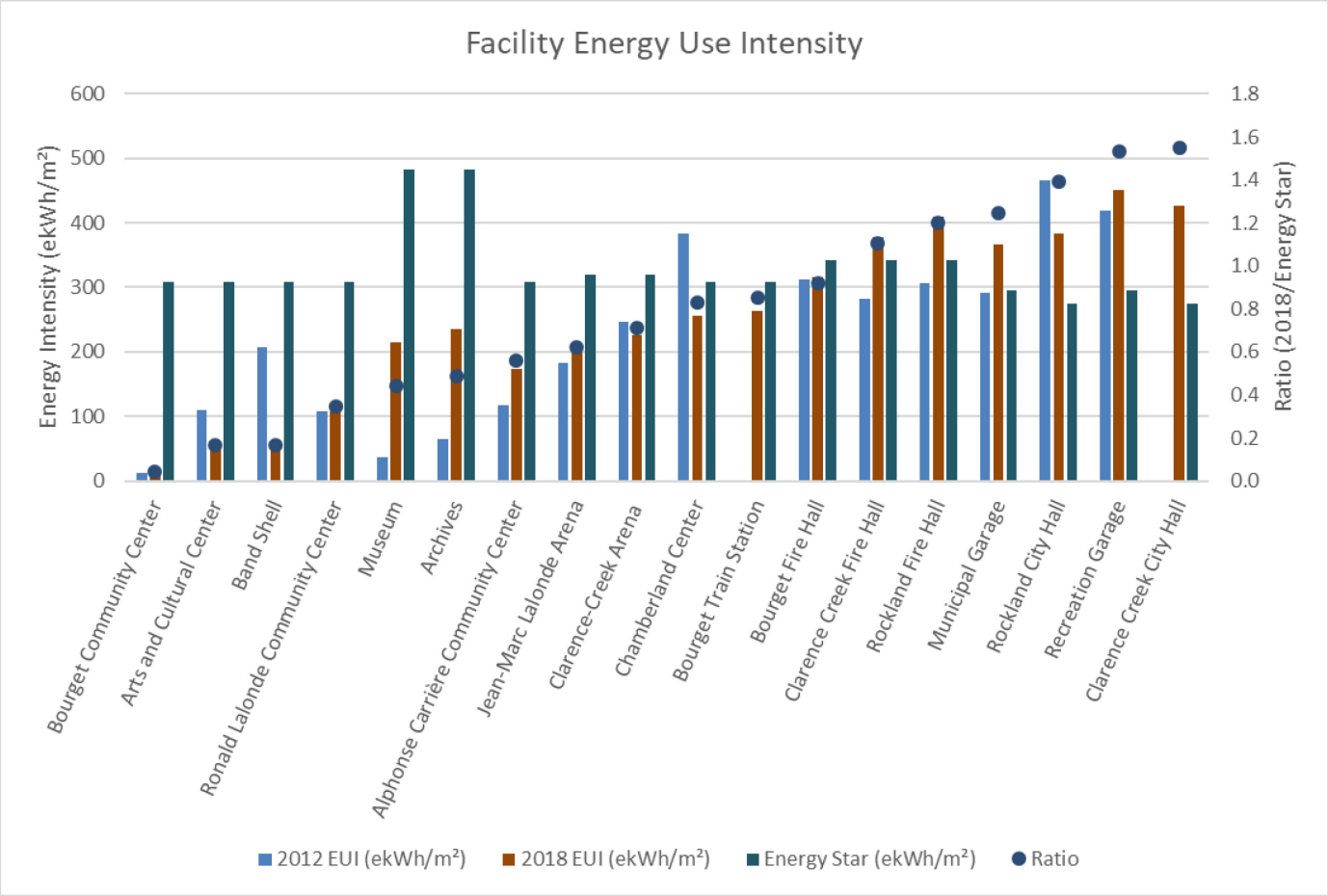


Figure 6: 2012 and 2018 Energy Use Intensity for City's Facilities Compared to Energy Star® Portfolio Manager® Canadian National Median Table for Energy Use Intensity by Property Type

All of the City's facilities performed reasonably well against the national median, a ratio of less than 1 represents a facility that is equal to or better than the national median for that facility type. The Clarence Creek City Hall is the worst performing facility and as a large energy user should be a focus for energy efficiency measures.

Figure 7 displays the 2012 and 2018 EUI for the City's water and sewer treatment plants compared against the 2019 Energy Star® Portfolio Manager® Canadian National Median Site EUI for each property type. The EUI is measured as the total annual energy consumption over the annual flow through the facility measured in mega litres (ML).

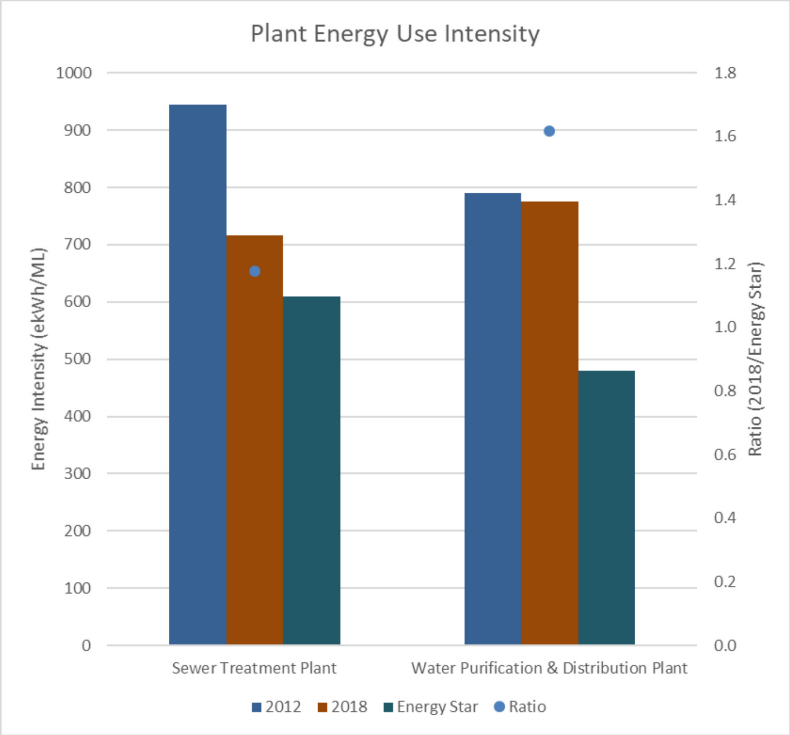


Figure 7: 2012 and 2018 Energy Use Intensity for City's Plants Compared to Energy Star® Portfolio Manager® Canadian National Median Table for Energy Use Intensity by Property Type

Both of the plants consume more energy than the national median, a ratio greater than 1 represents a facility that consumes more energy than the national median for a facility of that type. As these facilities are also the City's greatest energy consumers, they should be the focus of energy efficiency initiatives.

6.0 Conversation and Renewable Energy Measures

6.1 Energy Conservation Measures

Table 5 lists the energy conservation measures the City has completed since 2014 when the last energy conservation and demand management plant was published.

Building	Project	Implementation Date	Description
Museum	Fuel switching and LED retrofit	2015	Converted from heating oil to natural gas and LED lighting replaced some incandescent lighting.
Clarence Creek Arena	LED lighting retrofit	2017	All lighting replaced with LED lights.
Bourget Community Centre	LED lighting retrofit	2018	LED lighting replaced some incandescent lighting.
Rockland City Hall	LED lighting retrofit	2018	LED lighting replaced some incandescent lighting.
Archives	LED lighting retrofit	2018	LED lighting replaced some incandescent lighting.
Band Shell	LED lighting retrofit	2018	LED lighting replaced some incandescent lighting.
Alphonse-Carrière Community Centre	LED lighting retrofit	2018	LED lighting replaced some incandescent lighting.
Recreation Garage	LED lighting retrofit	2018	LED lighting replaced some incandescent lighting.
Clarence Creek City Hall	LED lighting retrofit	2018	LED lighting replaced some incandescent lighting.
Arts and Cultural Center	Fuel switching	2018	Switching from electric baseboards to a natural gas forced air furnace.
Ronald Lalonde Community Centre	Fuel switching and LED retrofit	2019	LED lighting replaced some incandescent lighting.

Table 5: Completed Energy Conservation Measures by City since Previous Plan

The LED lighting retrofits are the most significant measure the City has completed since the last Plan resulting in electricity consumption decreasing for these facilities. Many of the actions identified in the

previous Plan were not completed over the last five years due to a combination of budget cuts and limited bandwidth from City staff to take on new projects.

City of Clarence-Rockland Street Lighting Policy

In 2017, the City of Clarence-Rockland approved a Roadway Lighting Policy in accordance with the Ontario Electrical Safety Code as well as the Illuminating Engineering Society of North America (IESNA). In addition to a planned retrofit of the existing streetlights, the City will install LED lighting instead of the previous high pressure sodium lights going forward. By using more efficient LED technology and photo sensors, the average energy use intensity of the streetlights will drop from its current annual usage of 934 kWh per light to an estimated 431 kWh per light, a drop of more than half. Light pollution has also been minimized through maximum lumen outputs as well as the use of semi or full cut-off luminaries which block light from needlessly shining into the sky.

6.2 Renewable Energy Measures

The City does not currently generate any renewable energy.

7.0 Current State of Energy Management

7.1 Energy Management Practice

Energy management is the continuous process of managing change in the City's behavioural, organizational and technical practices. The City's current state of energy management has been assessed across eight equally weighted categories: Commitment, Planning, Organization, Projects, Financing, Tracking, Communication, and Training. Energy management practices are improved by following the Plan-Do-Check-Act principles of ISO 50001, an international energy management standard.

- **Plan:** this Plan documents the City's energy management objectives and the actions that have been defined to improve its energy performance.
- **Do:** the City intends to use this Plan as a roadmap to undertake actions and achieve its desired objectives.
- **Check:** the Energy Team's annual reviews will allow the City to readily measure whether change is successful.
- **Act:** the City is committed to continually assessing progress towards this Plan, revisiting its contents and making revisions every five years.

7.2 Self-Assessment of Current Practice

Each of the eight energy management practice categories can be divided into practice levels: One is the lowest score and means there is plenty of room for improvement, while a score of five means that the City's operations are aligned with best practices. Progressing upward across all eight categories will ensure the City optimizes the way it manages energy. The City's energy management performance was originally self-assessed for the previous Plan across the eight categories; this self-assessment has been refreshed for this Plan, with the results displayed below.

Commitment: an energy policy endorsed by Council, and with clear targets, catalyzes change from the top down.

COMMITMENT	1	2	3	4	5
	No policies	An undocumented set of guidelines or policies	Un-adopted energy policy set by municipal staff	**A formal energy policy exists but lacks active commitment from council**	Energy policy exists with clear targets and has commitment from mayor and council
	Description of Current Practice: 4 – In 2014 a formal energy policy was set in the form of an energy conservation and demand management plan. However, resource and budget allocations were not provided to accomplish the action items established in the 2014 plan.				

Planning: An energy management plan provides a roadmap to achieve targets.

PLANNING	1	2	3	4		5
	No energy management plan	One person delegated to develop an energy management plan	**Only technical municipal staff are involved in developing an energy management plan**	All municipal departments are represented on the planning team with some support from council		An energy management plan covers all major practice categories, defines how targets will be achieved, and is implemented by all applicable municipal departments and staff
	Description of Current Practice: 3 – Only the Municipal/Recreational Facility Manager and Wastewater/Water Treatment Plant Manager provided input into the development of this plan.					

Organization: Energy management is most effective when it's an integral part of all City operations.

ORGANIZATION	1	2	3	4	5
	No one is accountable for energy management	Energy management is the part time responsibility of a municipal staff member with limited authority	**Energy management is the part time responsibility of a municipal staff member with authority**	Energy is managed via an energy committee which works directly with municipal departments and staff	Energy management is fully integrated into council's agenda with clear delegation of responsibility to the energy committee, and subsequently to municipal departments and staff
	Description of Current Practice: 3 – The Energy Officer designation is a part-time responsibility of a municipal staff member at the management level.				

Projects: Routine assessment of technical, behavioural and operational projects reduces missed opportunities.

PROJECTS	1	2	3	4	5
	No mechanism to identify or develop energy efficiency opportunities	**Informal assessments with ad hoc resources to identify energy efficiency opportunities**	Development of energy efficiency opportunities on an infrequent basis with selected implementation	Infrequent but formalized energy efficiency opportunity identification, basic business cases and implementation	Ongoing identification of projects (retrofit, renewable energy, behavioural, operational, and maintenance), development of business cases, and implementation
	Description of Current Practice: 2 – Assessments are typically informal, with no policy for the development of energy efficiency opportunities. Many opportunities identified in the previous Plan were not implemented due to a lack of budget and City staff resources.				

Financing: A commitment to fund opportunities that meet established investment criteria facilitates project management.

FINANCING	1	2	3	4	5
	No investment in energy efficiency	Only low cost measures considered for financing	**Investment using short term or simple payback criteria only, no consideration for life cycle costing**	Investment using life cycle costing and/or internal rate of return	Clearly defined commitment (policy) to implementation and financing mechanism(s) for energy efficiency projects
	Description of Current Practice: 3 – The City does not have an established investment metric by which to measure energy efficiency projects. This Plan has utilized simple payback as the sole investment metric for comparing options.				

Tracking: You cannot manage what you do not measure. Energy performance can be managed by monitoring and benchmarking.

TRACKING	1	2	3	4	5
	No energy data being tracked or benchmarked	Cost reporting based on utility invoice data, no benchmarking	**Facility level performance is monitored against baseline using utility data with ad hoc use of findings, no benchmarking**	Facility level performance is monitored against baseline and benchmarked using key performance indicators, results from major projects are measured	Energy accounting system sets targets, forecasts use, monitors use against baseline and forecast, and identifies faults. Savings are tracked at a project and system level using sub-meters. Performance is benchmarked
	Description of Current Practice: 2 – The City has been tracking cost using utility invoices on an annual basis and energy consumption in order to meet the ministry reporting requirements. Performance benchmarking is not part of the City's regular activities. Some basic benchmarking was included as part of the previous Plan and the metrics used in these benchmarks have been improved as a part of this plan.				

Communication: Showcasing the value and performance of energy management increases support and buy-in.

COMMUNICATION	1	2	3	4	5
	No promotion of energy efficiency	Informal methods employed to promote energy efficiency	Energy efficiency related activities are reported or marketed occasionally within the municipality	The value of energy efficiency and the performance of energy management is reported and marketed routinely within the municipality	The value of energy efficiency and the performance of energy management is reported and marketed both within the municipality and externally to residents and stakeholders
	Description of Current Practice: 1 – There is no active promotion of energy efficiency projects.				

Training: Awareness and capacity development enable operational and behavioural change.

TRAINING	1	2	3	4	5
	No energy management or operational training	One municipal staff member has received training in energy management practices	Technical municipal staff have received training in energy efficiency management practices	Energy committee members, and technical municipal staff have received training in energy management practices	Council has received training in energy management practices, and energy committee members, and technical municipal staff receive ongoing training.
	Description of Current Practice: 1 – Municipal staff have not taken part in any training related to energy management.				

As shown in Figure 8, the City's energy management practices have increased in commitment, planning, and organization. The other categories have remained static since the 2014 plan.

Figure 8: City's state of energy management practices, 2014 compared to 2019.

8.0 Energy Management Policy

Whereas the previous sections present information on the City's current state of energy management, this section outlines the City's goals for improving its energy management practices in the form of a policy. This policy was originally developed as part of the previous Plan and has been updated accordingly for this plan.

City of Clarence-Rockland's Energy Management Policy

The City of Clarence-Rockland's Energy Management Policy outlines the City's commitment to energy management, its vision statement, strategic objectives, and short- and long-term targets.

8.1 Commitment

To ensure that our energy management vision is realized, city council and senior staff will incorporate energy management into all areas of activity including our organizational management procedures, procurement practices, capital asset and investment decisions, and facility operations and maintenance. This will be accomplished by:

1. *Ensuring the necessary resources are allocated to enable the implementation of actions outlined in the City's Energy Conservation and Demand Management Plan (Plan);*
2. *Holding all city staff accountable and responsible for managing energy through corporate targets; and*
3. *Ensuring that city staff, council and ratepayers are updated regularly on progress as measured against the targets and performance indicators included in the Plan.*

8.2 Vision

The City of Clarence-Rockland will approach energy management proactively. We will pursue energy solutions that will lead to environmental, societal and economic benefits.

8.3 Objectives

The City is focused on changing the way energy is used across the facilities and infrastructure within the scope of the Plan. Our three core objectives, outlined below, will help us reach our targets:

*8.3.1 **Projects:** Level 3 Practice*

Improve capacity to identify and develop energy efficiency opportunities, specifically in the context of scheduled capital renewal. Improved development of business case will help to navigate through the funding process.

*8.3.2 **Communication:** Level 2 Practice*

Energy efficiency is promoted informally through the City's communication.

*8.3.3 **Training:** Level 2 Practice*

One city staff has received training in energy efficiency management practices.

8.4 Targets

The following targets have been set in the context of the City's current performance and the opportunities for improvement identified within this Plan. Progress toward these targets will be measured in terms of energy use intensity using the most appropriate meter for the type of target.

8.4.1 Facilities

Energy use intensity will be measured based on gross energy use intensity using gross floor space[2]:

- ***Short Term:** Return EUI_F by 2024 to benchmark year of 2012.*
- ***Long Term:** 4% reduction in EUI_F by 2029 over benchmark year of 2012.*

8.4.2 Plants

Energy use intensity will be measured based on gross energy use intensity using flow rates[3]:

- ***Short Term:** 20% reduction in EUI_P by 2024 over benchmark year of 2012.*
- ***Long Term:** 25% reduction in EUI_P by 2029 over benchmark year of 2012.*

8.4.3 Street Lighting

Energy use intensity will be measured based on energy use per streetlight[4]:

- ***Short Term:** Maintain current electricity consumption per fixture ratio.*

9.0 Identified Energy Initiatives

This section identifies initiatives that can be pursued by the City to meet the energy reduction targets identified in the previous section. The first list details specific energy efficiency initiatives that can be achieved some of the City's facilities. This is followed by a general discussion on larger general initiatives the City can pursue to reduce energy consumption at their facilities. Finally a summary of available funding programs that provide incentives and financing for energy efficiency measures and renewable energy projects is included for the City to explore.

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[2] $EUI_F = \frac{Total\ Annual\ Energy\ Consumption\ for\ All\ Facilities}{Gross\ Floor\ Space\ of\ All\ Facilities}$

[3] $EUI_P = \frac{Total\ Annual\ Energy\ Consumption\ for\ All\ Facilities}{Total\ Flow\ Rate\ through\ Water\ and\ Sewer\ Treatment\ Plants^3}$

[4] $EUI_S = \frac{Total\ Annual\ Energy\ Consumption\ for\ All\ Streelights}{Total\ Number\ of\ Streetlights}$

9.1 Energy Efficiency Initiatives

Table 6 displays a list of potential energy efficiency projects sorted by quickest payback the City can pursue to meet its energy reduction targets. For each of the potential actions, order of magnitude cost estimate and energy savings, the simple payback and greenhouse gas emissions reductions are provided. Possible funding opportunities that could reduce capital costs are identified but were not included in the payback calculation (more information on these programs is detailed in Section 9.3). Similarly, the cost of carbon, and its effect on future fuel price increases, has not been factored into simple payback. Both factors could improved payback.

Action	Cost Estimate	Completion Date	Energy Savings	Annual Monetary Savings	Greenhouse Gas Savings	Simple Payback	Stakeholders	Funding Opportunities	Next Steps
All Facilities Replace standard thermostats with programmable thermostats. Recommission existing programmable thermostats.	$4,000	Q1 2020	114 MWh	$2,675	20223 kg	1 years	Public Works Administration Recreation Fire Department Library		Solicit and compare quotes from contractors
LED Street Lighting Upgrade all cobra heads street lights to LEDs	$245,000	Q4 2019	807 MWh	$104,910	28687 kg	2 years	Public Works Infrastructure & Engineering	IESO's Save On Energy	Currently underway
Clarence Creek Arena Modernizing Refrigeration System Controls	$30,000	Q4 2021	53 MWh	$6,826	1867 kg	4 years	Recreation	IESO's Save On Energy Retrofit Program CoEnergy Co-Op's Services	Conduct a condition assessment study of refrigeration system
Clarence Creek Arena Replace rooftop units with high-efficiency models.	$7,500[5]	Q2 2020	15 MWh	$1,950	533 kg	4 years	Recreation	Enbridge Smart Savings Fixed Incentive Program	Solicit and compare quotes from contractors
Rockland City Hall Replace rooftop units with high-efficiency models.	$7,500	Q2 2020	15 MWh	$1,950	533 kg	4 years	Recreation	Enbridge Smart Savings Fixed Incentive Program	Solicit and compare quotes from contractors
All Facilities Replace HID exterior fixtures with LED equivalents	$30,000	Q1 2020	38 MWh	$4,966	1358 kg	6 years	Public Works Administration Recreation Fire Department Library	IESO's Save On Energy Retrofit Program	Solicit and compare quotes from contractors
Rockland Water Treatment Plant Energy Optimization Study	$100,000	Q1 2020	100 MWh	$13,000	3555 kg	8 years	Public Works Infrastructure & Engineering		Solicit and compare quotes from energy engineering firms

Table 6: Specific energy efficiency initiatives that can be pursued by the City to meet their targets

[5] Incremental cost of a high-efficiency rooftop unit over a standard rooftop unit.

The 2014 plan listed many fuel switching initiatives mainly focused on changing the heating system at different facilities from electric heating or hot water to natural gas. Though switching to natural gas may reduce utility costs at present, it does not decrease the overall energy consumption. The focus of this plan is to reduce the City's energy consumption as measured by EUI and for that reason the fuel switching action items from the previous plan have not been included. Furthermore, switching from electric heating to natural gas will increase the City's greenhouse gas emissions. Due the recent introduction of the federal carbon tax this may increase the City's energy costs over time (see section 3.1).

9.2 General Initiatives

In addition to the specific projects identified in the section above there are general initiatives that cover a broad range of facilities and concepts the City should pursue to ensure they will effectively meet their targets.

9.2.1 Energy Audits of Major Accounts

As displayed in Figure 5, four buildings consume more than 50% of the City's total energy, the water treatment plant, the wastewater treatment plant, the Clarence Creek Arena, and the Jean-Marc Lalonde Arena. The EUIs for both plants are higher than the national median. The arenas are both over 40 years old and the plants are due for major overhauls in the coming years. Rockland City Hall is the next largest energy user and its EUI is 40% above the national median. These facilities would benefit from further analysis to accurately identify costs and energy savings. JLR regularly conducts energy audits for municipalities that want to gain a deeper understanding of how energy is being utilized. Just as this Plan has identified the City's biggest energy accounts, an energy audit will identify the biggest energy consumers within a facility, as well as opportunities to save energy. As explained in Section 9.3.1, the Green Municipal Fund will cover 50% of the cost of feasibility studies into retrofits of municipal facilities, which can include an energy audit.

9.2.2 Energy Monitoring

In order to manage the energy consumption of its facilities and plants the City needs to have access to energy data. Installing energy monitoring equipment will allow City staff to be notified in real time when a location or piece of equipment is consuming an abnormally high amount of energy. This can result in small issues being corrected before they turn into expensive problems at the end of the month. As well, automated monthly and annual reports can assist in determining which location or equipment should be the focus of the next energy efficiency project.

Additionally, it is recommended that utility bills be summarized and reviewed on an ongoing basis. As apart of this plan a utility bill tracking tool was developed to allow for simple input of monthly utilities with automated graphs and summaries. This, in effect, is a simplified monitoring process and can identify anomalies or increase in building energy use as compared to a previously defined bench line.

9.2.3 Revolving Green Fund

Many of the initiatives identified in the previous Plan were not complete due to a lack of City resources and budget. However, due to the ongoing LED street lighting retrofit project, the City's electricity bill is expected to be reduced by more than

$100,000 annually. In order to quantify and reinvest the savings from energy efficiency projects, many municipalities establish a Revolving Green Fund or "Green Bank". A revolving green fund quantifies the savings earned from energy efficiency projects and sets aside a portion of the savings into a segregated fund that can be used to fund future projects. This provides a continuous source of funding for future projects and an incentive to monitor and ensure completed projects provide the expected savings.

9.2.4 Energy Manager

Energy managers have the strategic and technical expertise to recommend the energy-saving practices, equipment and technologies that are right for the City's facilities and plants. They have the skills to implement the concepts outlined in this Plan working with various stakeholders across the municipality. The staff of many small municipalities are overburdened with their day-to-day responsibilities to take on the additional role of energy management. Small municipalities work hard to balance their existing budget which makes it difficult to find additional funding to hire a dedicated energy manager on staff. The City should consider hiring an engineering consultant, such as JLR, to provide "as-needed" Energy Manager services. This format can provide the benefits on an Energy Manager on staff without burdening existing staff or the cost of a new full-time staff member.

9.2.5 Solar Photovoltaic Preliminary Assessment Studies

The cost of solar photovoltaic modules has significantly decreased over the past decade and can provide an economically viable means of producing a portion of a facilities' electricity consumption on-site. Solar modules have a 25 year manufacturer's warranty on performance and most systems are projected to have a 35 year life. Due to the Feed-In-Tariff program in Ontario, there are numerous installation companies and contractors that have over a decade of experience installing rooftop solar systems. Typically, PV arrays are deployed on flat roofs using commercial PV racking and held in place with ballasts to avoid roof penetrations. However, the deployment of solar carports or ground mounted solar pergolas is increasing and there exists a potential to utilize the City's parking lots and green spaces. Presently in Ontario, PV generation is permitted on facilities in a net-metering arrangement where any electricity generated is consumed on-site and excess electricity is exported to the grid for a credit that can be used on future bills. A typical 300 kW rooftop system in this arrangement could pay for itself in 13 years out of an expected 30 year system life. If the City is interested in exploring the renewable energy capacity of their facilities they should consider hiring an engineering consultant to conduct a preliminary assessment of the PV capacity of each building. The most suitable sites have been identified a structural assessment by a qualified engineering firm and a grid impact assessment from the local distribution should be conducted.

9.3 Available Funding Programs

There are several funding opportunities available for energy efficiency measures, which for a municipality, include the Federation of Canadian Municipalities, utility-managed electricity and gas savings programs. Furthermore, the possibility of third party financing for energy retrofits can be considered. Some suggested matches between City assets and the funds are suggested in blue font.

9.3.1 Green Municipal Fund

The Federation of Canadian Municipalities established the Green Municipal Fund in 2000 to drive local green innovation across the country.

The Green Municipal Fund will provide funding for feasibility studies, pilot projects as well as capital projects:

- **Feasibility Studies** – Grant to cover up to 50% of eligible costs to a maximum of $175,000 (i.e., $350,000 feasibility study).
- **Pilot Projects** – Grant to cover up to 50% of eligible costs to a maximum of $350,000 (i.e., $700,000 pilot project).
- **Capital Projects** – Low-interest loan of up to $10,000,000 to cover 80% of eligible costs (i.e., $12,000,000 capital project) including a grant for up to 15% of loan amount (i.e., $1,500,000).

Eligible costs include items such as: consulting costs to write funding application incurred up to 90 days prior to application; fees for professional consultants; and in-kind contributions of staff salaries up to 10% of eligible costs.

The Green Municipal Fund currently provides funding for the following initiatives that can assist the City in reducing their Energy Consumption:

- **Energy recovery or district energy - r**ecovered or renewable thermal energy in new or existing facilities to reduce fossil fuel or grid electricity by at least 40% (e.g., a combined heat and power system using biogas anaerobic digesters at the sewer treatment plant or heat recovery from a modernized refrigeration system at the arenas).
- **Retrofit of municipal facilities –** retrofits that improve energy efficiency by at least 30% in municipal facilities with a maximum of 10% through on-site, renewable energy (e.g., a deep green retrofit at the Jean-Marc Lalonde Arena, including a rooftop solar array, LED lighting upgrade, condensing boilers, and building automation system).
- **New construction of energy efficient municipal facilities –** net zero energy performance in new municipal facilities (e.g., net zero energy feasibility study for a new fire station).
- **Renewable energy production on a brownfield –** initiatives that generate renewable energy on a brownfield site with or without remediation.

9.3.2 Save On Energy

The Save on Energy suite of programs offers incentives for energy-efficiency. Formerly, this program was delivered by local utilities but as of April 2019 all Save on Energy programs are delivered by the Independent Electricity System Operator (IESO), a provincial agency. Save on Energy has programs for home owners, businesses, industry and municipalities. Below is a sample of programs that would be applicable to the City's initiatives.

9.3.2.1 Retrofit Program

The Save on Energy Retrofit program provides incentives to upgrade equipment to high efficiency models. The two types of applications are:

- **Prescriptive Track** applications are ideal for quick system upgrades. Incentive levels are based on predefined amounts based on a number of units of product. Projects must be pre-approved and be worth a minimum of $500.

- **Custom Track** applications are designed to provide flexibility for more comprehensive projects, with opportunities for increased energy savings. Incentives are based on energy savings over pre-project baselines and are capped at 50% of project costs. Projects must be pre-approved, provide savings for at least 48 months and have an incentive of at least $1500. Available incentives include:

    - **Lighting – t**he greater of $400/kW of demand savings or $0.05/kWh of first-year electricity savings (e.g., exterior lighting retrofit).

    - **Other Measures – t**he greater of $800/kW of demand savings or $0.10/kWh of first-year electricity savings.

9.3.2.2 Process and Systems Upgrades

The Save on Energy Process and Systems Upgrades program provides incentives for specialized upgrade projects for large energy consumers. This program focuses on large scale projects (minimum of 300 MWh in energy savings required) that require engineering design to optimize overall processes and systems (e.g., water treatment plant/ water distribution system improvements; waste water treatment plant aeration system improvements). Incentives are available for energy efficiency measure and behind the meter generation from waste energy recovery. They are provided in two phases:

- **Engineering Feasibility Study** – once an opportunity has been identified with energy savings and project costs determined, an engineering feasibility study can determine the base case energy usage of the current system and propose energy savings opportunities or technologies that could be implemented. This study

can help to build a business case for process efficiency improvements and support a project application. Incentives for engineering feasibility studies are:

- 50% of the cost of the study paid upon IESO approval of completed study; and
- The remaining 50% paid upon confirmation of the Project In-Service Date.

- **Project –** the project incentive is paid after the one year measurement and verification of the project is complete. An advance payment of 50% can be paid upon approval of the IESO. The incentive will be the lesser of:
  - 70% of eligible project costs;
  - $200/MWh for electricity savings;
  - Incentive required for a 1 year payback; or
  - $10,000,000 per project.

9.3.3 Enbridge's Smart Savings

Enbridge is the natural gas utility serving Eastern Ontario, their Smart Savings programs offer incentives to homeowners, businesses, industry and municipalities to reduce their natural gas consumption by investing in energy efficiency upgrades. Below is a sample of programs that would be applicable to the City's initiatives.

9.3.3.1 Fixed Incentive Program

This program provides incentives to offset the costs of installing energy efficient natural gas equipment in new and existing buildings. A variety of financial rebates are available for investing in energy efficient space heating and water heating measures, as well as ENERGY STAR® qualified equipment:

- **Air Doors**
- **Condensing Boilers**
- **Condensing Furnaces**
- **Condensing Make-up Air Units**
- **Condensing Storage and Tankless Water Heaters**
- **Demand Control Kitchen Ventilation (DCKV)**
- **Demand Control Ventilation (DCV)**
- **Destratification Fans**
- **ENERGY STAR® Qualified Equipment**
- **High Efficiency Boilers**
- **Heat Recovery Ventilator (HRV)**
- **Energy Recovery Ventilator (ERV)**
- **Infrared Heaters**
- **Low-Flow Showerheads**

9.3.3.2 RunitRight Program

This program helps natural gas consumers find low or no cost operational improvements to reduce energy usage. Past program participants have found as much as 5% in energy savings for little cost. This program is conducted in three steps:

1. **Investigate** – Enbridge will fund $1,000 towards a facility investigation to assess current energy performance and identify operational improvements to meet the goal of 5% natural gas savings. The results will be summarized in a report that will highlight estimated cost and energy savings for the most cost-effective improvements.

2. **Implementation** – Enbridge will provide up to $8,000 towards implementation costs which could cover 100% of project costs.

3. **Monitor** – Enbridge will provide their Energy Management Information System (EMIS) free of charge for the first 12 months. Alternatively, you may install a third party EMIS and receive a $1,000 incentive.

9.3.3.3 Custom Retrofit Program

An Enbridge Gas Energy Solutions Consultant will conduct a free site walkthrough to identify opportunities and calculate the estimated gas savings, as well as available incentives. Financial incentives are available to cover up to 50% of the project cost to a maximum of $100,000 per project. The first 20% of gas savings receive an incentive of $0.15/m³ and the remaining gas savings receive an incentive of $0.30/m³.

9.3.4 CoEnergy Co-Op

CoEnergy is a local investment co-operative created by the members and staff of the Ottawa Renewable Energy Co-operative (OREC) in December 2018 to expand the adoption of sustainable energy technologies in Eastern Ontario. CoEnergy enables individuals to participate in the financing and ownership of energy efficiency and renewable energy projects. It is a multi-class co-op with two classes of membership:

- **Consumer Members** who are purchasing the energy services (e.g., City of Clarence-Rockland).

- **Community Members** who support these projects in various ways including financial and benefit from a more resilient and sustainable local community (e.g., residents of Clarence-Rockland).

CoEnergy offers a variety of energy services available to municipal properties in Eastern Ontario including the following that may be of interest to the City:

9.3.4.1 Net Metered Solar

Net metering allows for the generation and self-consumption of electricity on your property. The energy produced is first consumed on-site and any extra energy is fed into the grid in exchange for a credit that can be applied to a later bill.

CoEnergy will finance, install, operate and maintain the net metered solar system and in exchange will provide energy at a low stable electricity rate for 30 years to the property owner.

9.3.4.2 Comprehensive Energy Saving Services

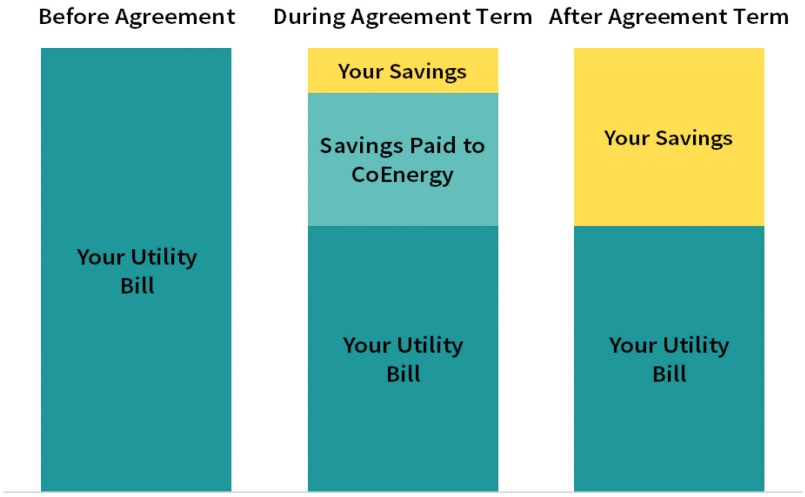

Figure 9: CoEnergy's Comprehensive Energy Savings Distribution (CoEnergy, 2018)

CoEnergy provides financing for green energy retrofits. CoEnergy works in collaboration with a third-party engineering firm such as JLR to conduct an energy audit that will identify energy saving opportunities. Working with the property owner, a portfolio of energy efficiency projects with a positive return on investment is selected. CoEnergy finances energy retrofits using investments from members of the community. Over the term of the agreement, a portion of the savings are directed to CoEnergy to repay its member while the property owner benefits from the energy savings. After the agreement term, the property owner continues to reap the savings from the project until the end of life of the equipment.

9.3.4.3 Federal Low Carbon Economy Fund

There are expected to be one or more programs launched by mid-2019 by the Federal Government's Low Carbon Economy Fund. The first will be in relation to proceeds raised from the carbon tax backstop program; the federal government has said that 10% of the proceeds will be returned to the MUSH++ sector (municipalities, universities, schools, hospitals, not-for profit, and first nations). The details of how this will operate are not yet

known. Second, there is a strong likelihood of another round of Low Carbon Economy Challenge grants, similar to those that were open in late 2018. These were a national competition providing grant funding for up to 40% of project costs (for municipalities) that achieve a substantial reduction in carbon emissions.

10.0 Expected Impact of Initiatives

This section provides a forecast of the expected impact if the City pursues all of the energy efficiency initiatives outlined in Section 9.1. Additional savings could be realized through the actions described in Sections 9.2 but they have not been included in these forecasts. Figure 10

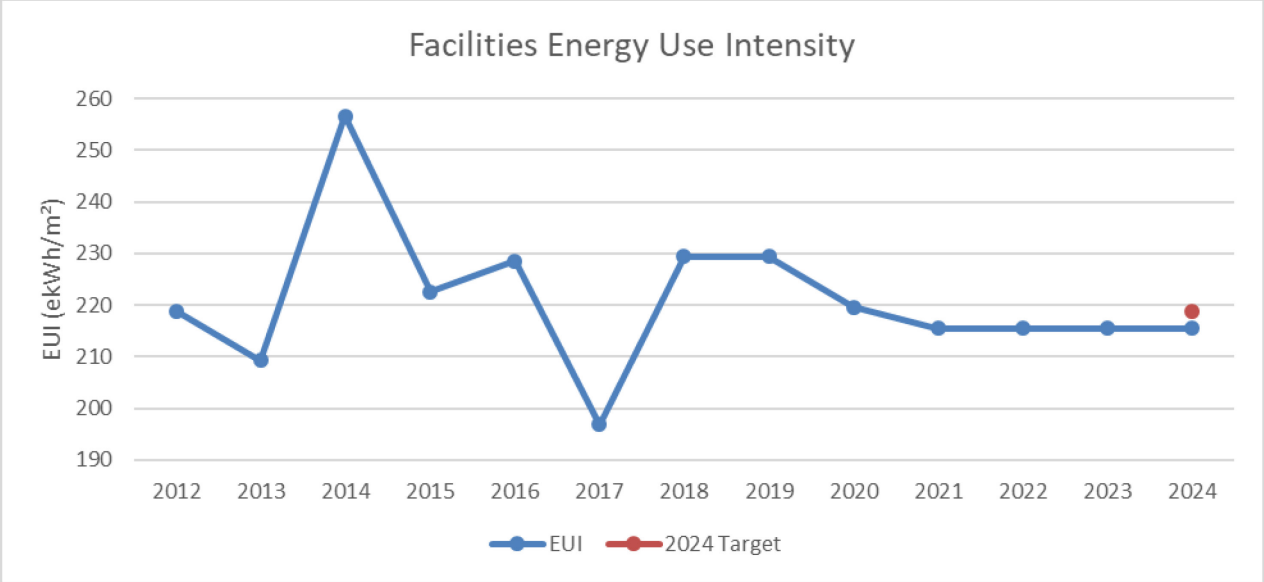

Figure 10: Gross Energy Use Intensity of All Facilities with 2024 Energy Reduction Target

displays the EUI of facilities, measured as total energy consumption per gross floor space. Figure 12 displays the EUI of Plants measured as total energy consumption per flow through the water and sewer treatment plants. The short term energy reduction for 2024 is also displayed as red dots on each graph. If the City pursues all of the energy initiatives for these facilities and plants, they will surpass their energy reduction target.

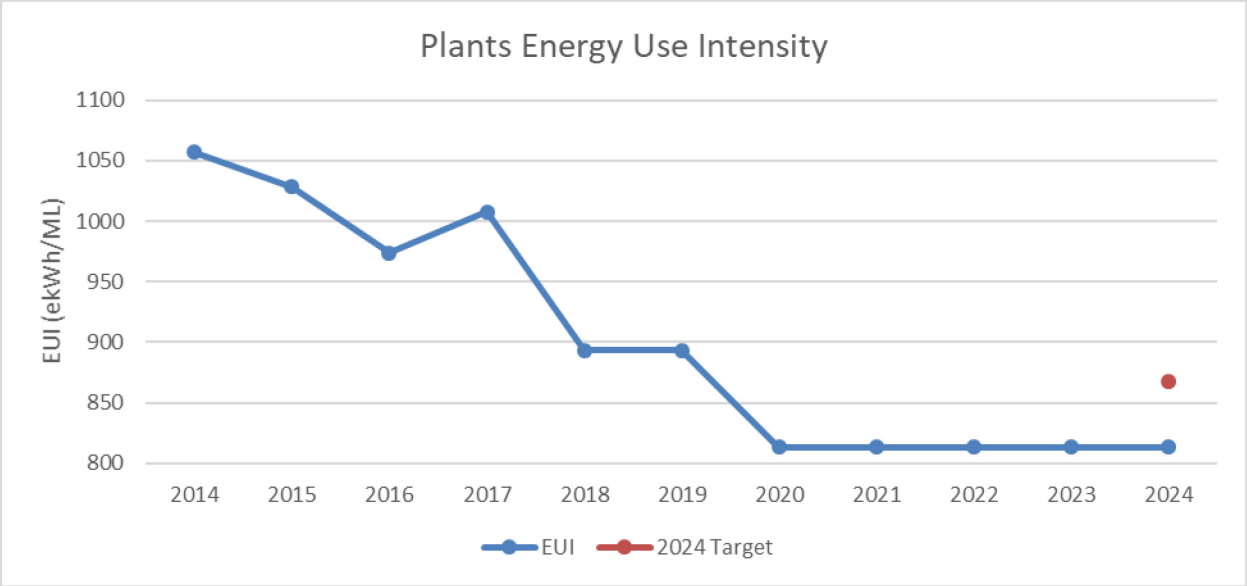

Figure 12: Gross Energy Use Intensity of all Plant with 2024 Energy Reduction Target

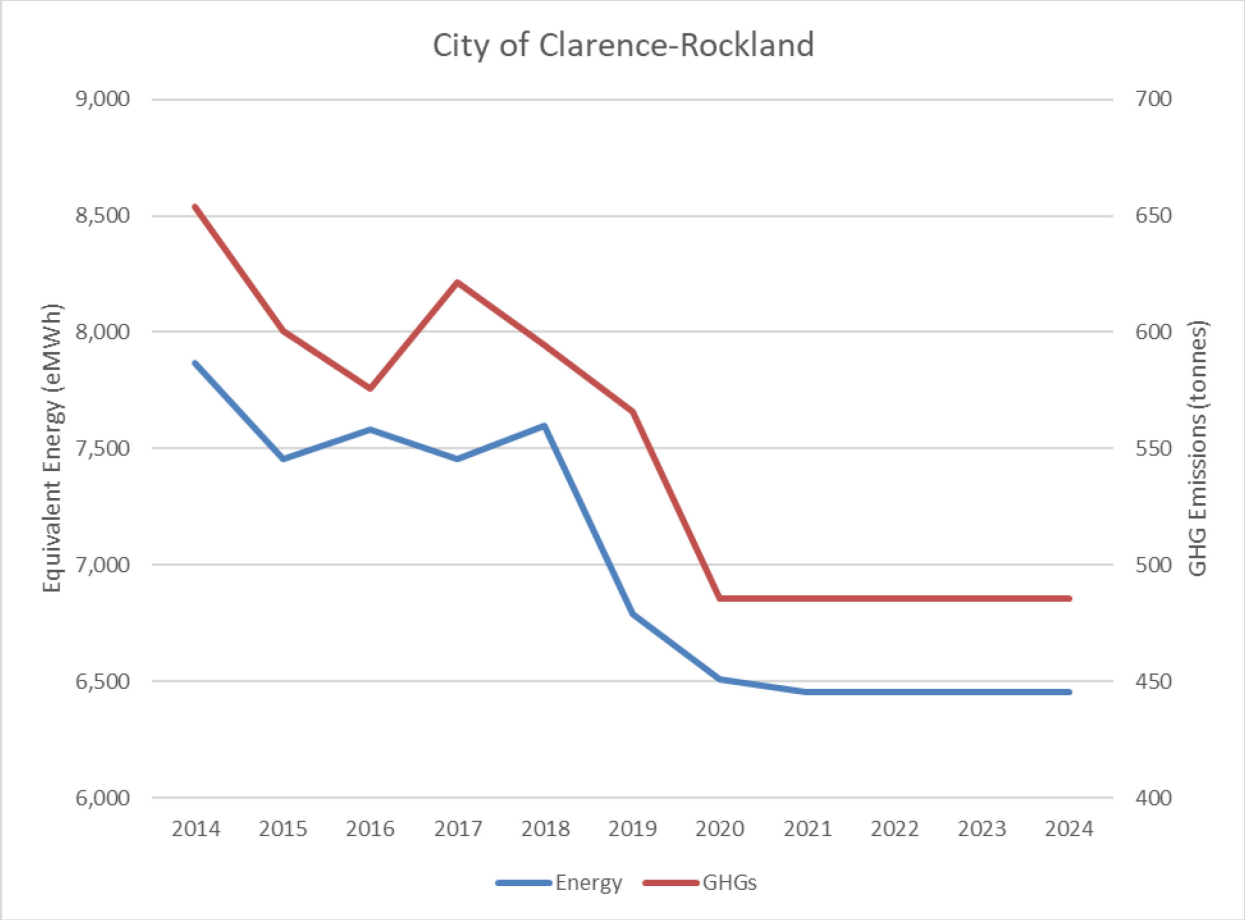

Figure 11: Total Energy Consumption and Greenhouse Gas Emission for the City of Clarence-Rockland Projected to 2024

11.0 Plan for Review

This Plan will be reviewed on an ongoing basis to reassess objectives and associated actions based on the output of the monitoring process. This annual review will be conducted by the Energy Officer in the form of a short report that will consists of:

- Suggest revisions to the Plan's Objectives to ensure that they reflect the City's current priorities.
- Assess progress against energy use targets upon completion of each calendar year. This should occur in concert with annual energy use reporting to the Ontario Ministry of Energy.
- Assess progress toward completion of actions with a special emphasis on high priority actions.

This Plan is required by the Ontario Ministry of Energy to be formally revised every five years.

This report has been prepared for the use of the City of Clarence-Rockland, for the stated purpose, for the named facilities. Information contained within this report is based on data provided by the City of Clarence-Rockland, J.L. Richards & Associates Limited makes no warranties or guarantees to the accuracy of this information. Its discussions and conclusions are summary in nature and cannot be properly used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report was prepared for the sole benefit and use of City of Clarence-Rockland; any re-use or modification to this report and its appendices shall be at the sole risk of the City.

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J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

RAPPORT N° IMIT-2019-006

Date	16/09/2019
Soumis par	Michel Cousineau
Objet	Cybersecurity Strategic Plan
# du dossier	

1) **NATURE / GOAL :**
To obtain Council's approval of the Clarence-Rockland Cybersecurity Strategic Plan

2) **DIRECTIVE/PREVIOUS POLICY :**
None

3) **DEPARTMENT'S RECOMMANDATION :**
THAT The Committee of the whole recommends that Council approve the City of Clarence-Rockland Cybersecurity Strategic Plan, as recommended in report IMIT-2019-006.

QUE Le comité plénier recommande que le conseil approuve le Plan stratégique de cybersécurité de la ville de Clarence-Rockland, tel que recommandé au rapport no. IMIT-2019-006.

4) **BACKGROUND :**
The threat to a city such as Clarence-Rockland is growing since smaller cities are becoming prime targets for cyber attacks due to the often limited resources available to them for protecting their assets.

Historically, cybersecurity has been very technology centric. In the modern digital world, every organization needs to have a cybersecurity strategic plan that addresses multiple areas such as policies, processes, training as well as the technological aspects.

5) **DISCUSSION :**
In order to minimize the City's risks while optimizing our ability to protect our assets, a strategic plan has been created that outlines the various areas we to address in order to ensure we are investing time and funds effectively and efficiently.

The plan spans 3 years and will include a yearly budget review to ascertain the funds required to carry out its initiatives.

6) **CONSULTATION :**
N/A

7) **RECOMMANDATIONS OR COMMENTS FROM COMMITTEE / OTHER DEPARTMENTS :**
N/A

8) **FINANCIAL IMPACT (expenses/material/etc.):**
The administration recommends an addition of $30,000 to the capital budget to address initial needs. The amount will be for Council's consideration in the 2020 budget.

9) **LEGAL IMPLICATIONS :**
N/A

10) **RISK MANAGEMENT :**
The plan includes a risk management portion for all of its initiatives

11) **STRATEGIC IMPLICATIONS STRATÉGIQUES :**
This document will eventually be part of the larger IM/IT Strategic plan

12) **SUPPORTING DOCUMENTS:**
- City of Clarence-Rockland Cybersecurity Strategic Plan.docx (detailed plan)
- City of Clarence-Rockland Cybersecurity Startegic plan - Summary Presentation.PPTX

Ordre du jour
Agenda

- **Pourquoi** fait-on cela ?
- **Qu'est-ce** qu'on fait ?
- **Comment** on s'y prend ?
- **Qui** est impliqué ?
- **Quand** débutons-nous ?
- **Questions** ?

- **Why** are we doing this?
- **What** are we doing
- **How** are we going about it?
- **Who** is involved?
- **When** do we start?
- **Questions**?

Pourquoi fait-on cela?
Why are we doing this?

EQUIFAX

Uber

CapitalOne

Desjardins

Stratford

CITY OF BALTIMORE

Pourquoi fait-on cela?
Why are we doing this?

- Les pirates informatiques sont motivés par l'argent;
- Les petites villes sont devenues des cibles de choix;
- La cybercriminalité cause des billions de dollars chaque année;
- Il y a une attaque toutes les 14 secondes.

- Hackers are motivated by money;
- Smaller cities have become prime targets;
- Cyber crimes are now causing trillions of dollars every year;
- There is an attack every 14 seconds.

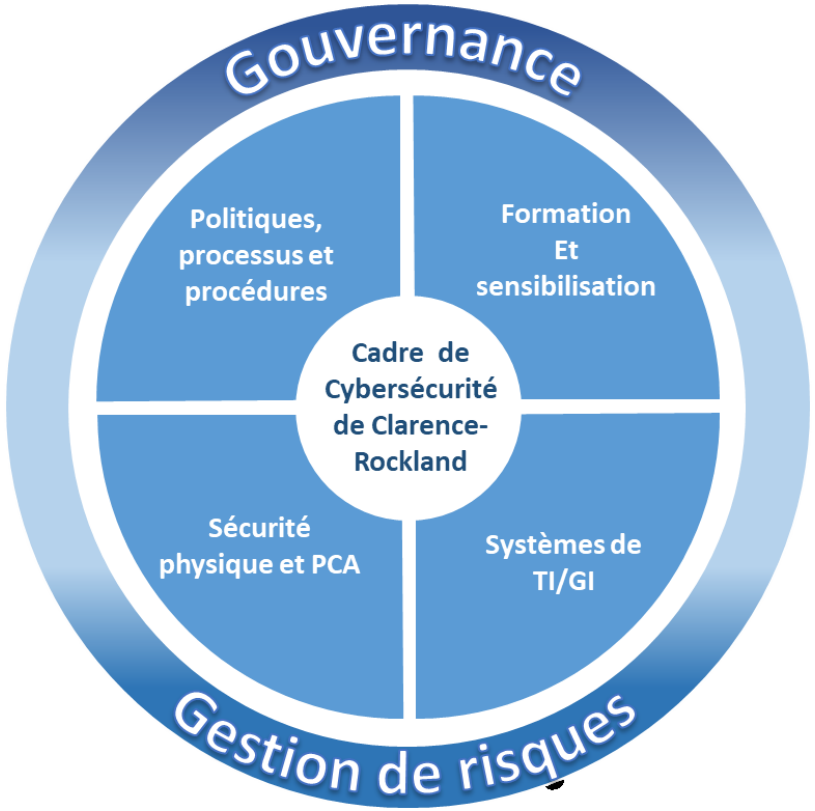
Ensemble des menaces / Threat Landscape

Qu’est-ce qu’on fait
What are we doing?

- Systèmes de sécurité en place;
- sauvegardes chaque heure de nos systèmes;
- Ce plan stratégique;
- Une tierce partie examinera notre sécurité;
- La création d’un plan d'action de 3 ans;
- Nous examinerons les plans régulièrement.

- We have security systems in place;
- Hourly backups of our systems;
- This Strategic Plan;
- We will be having a third party review our Security;
- Creation of a 3 year Action Plan;
- We will review the Plans regularly.

Comment on s'y prend?
How are we going about it?



Cadre de cybersécurité NIST

Qui est impliqué?
Who is Involved?

“La Cybersécurity est l’affaire de tout le monde!!”

“Cybersecurity is everyone’s business!!”

Quand débutons-nous ?
When do we start?

- **C’est déjà débuté;**
- **Les aspects de planification initiaux seront terminés avant la fin octobre et de nombreuses initiatives seront terminées d'ici la fin de l'année.**

- **It has begun;**
- **The initial planning aspects will be done before the end of October with many initiatives completed by the end of the year.**

- Nous devons nous concentrer sur ce que nous pouvons contrôler… Pas sur ce que les cybercriminels contrôlent.
- Aucune mesure d'atténuation des risques ou d'investissement peut garantir qu'aucune infraction ne se produira.

- We must take the approach of focusing on what we can control… Not what the cyber criminals control.
- No amount of risk mitigation or investment will Guarantee that no breach will ever occur.

"Cybersecurity is everyone's business"

City of Clarence-Rockland

Cybersecurity Strategic Plan

2019

Michel Cousineau
Chief Information Officer

Contents

Executive Summary

This document represents the City of Clarence-Rockland's first Cybersecurity Strategic Plan. It outlines our approach in ensuring the City's assets are protected to the best of our ability.

The Plan highlights a Framework that addresses for key areas:

- Policies, Processes and Procedures;
- Training and Awareness;
- Physical Security and Business Continuity;
- IT Systems

The result of this plan will be a 3-year Action Plan with initiatives geared at helping us protecting the City's assets. One of the key initial initiatives will be a third-party assessment which will further help to build our Action plan.

Since this is our first plan to address cybersecurity, we will need to review periodically as we will learn from the various initiatives and solidify the plan, as well as our security posture, as we go along.

Although the projects will be managed by the IM/IT Team, every staff member will be involved at some point.

Cost to implement the plan will be approximately **$30,000** for the first year.

NOTE: This document includes a lot of new terminology. Appendix A includes a glossary of common cyber terms.

"Cybersecurity is everyone's Business!"

Challenge

Cybersecurity has become the single largest risk to the world's organizations whether they are all government tiers or businesses of any size. Banks now rank Cyber Risk higher than credit, which is substantial when one considers the credit event of 2008/2009.

Cyber criminals are from every walk of life from young teenagers to organized crime and terrorist groups.

The companies and cities above are just a small example of some of the organizations that have been hacked by various means from ransomware to leaks of personal information.

Some alarming statistics

- Cybercrimes are costing Trillions $ in damages every year (Est. to be $6T/year by 2021);
- Half of damages are to smaller organizations;
- There is an attack every 14 seconds;
- Anyone can become a hacker with an investment of $1 and a little bit of time.

Since Hackers are always a few steps ahead with technology, we cannot only focus on this area.

We must take the approach of focusing on what we can control… Not what the cybercriminal control.

No amount of risk mitigation or investment will Guarantee that no breach will ever occur.

IM/IT Strategic Plan

The Security Strategic Plan would usually be part of a broader IM/IT Strategic plan. Given the current staffing issues on the IM/IT and the fact that Cybersecurity is a significant issue for municipalities, the decision was to prioritize a plan that addresses it specifically.

Cybersecurity Framework

Definition

A Cybersecurity Framework is a set of guidelines by which an organization manages its IT/IM (Cyber) Security. It includes everything from policies to tools and communications. It is critical for any organization to have some kind of framework in place in order to accurately measure its current capacities in protecting its assets as well as have a plan to improve problematic areas. Without a framework, it becomes very difficult to know which areas of focus should be/need to be a priority.

Approach

There are many approaches to creating a framework that range from ad-hoc priority setting to very stringent ISO 90021 certification, with many options in between. The City of Clarence-Rockland will be creating its own Framework for now that aligns as much as possible with the Cybersecurity Framework from the National Institute of Standards and Technology (NIST). It is highly regarded as one of the best standards for Cybersecurity and is flexible enough to allow us to slowly and gradually work towards it with the resources we have.

NIST Cybersecurity Framework

Created in 2014, it has become one of the most adopted standards for managing Cybersecurity. Its core is Broken down into 5 function areas that group the activities to achieve specific cybersecurity outcomes. They are: **Identify, Protect, Detect, Respond, Recover**.

Each of these functions are further broken down into categories, sub-categories and references which are described in Appendix B.

City of Clarence-Rockland (CCR) Cybersecurity Framework

Every Journey starts with some first steps. To simplify our implementation of a solid and modern framework while not confusing everyone with too much NIST nomenclature, we have developed the City's Cybersecurity Framework.

The framework is comprised of four sections as well as two over-arching functions (**Governance and Risk Management**) that are must be a part of all sections.

Below is a description of the framework's sections

Policies, Processes and Procedures

This section deals with the required rules, regulations and check lists to help in managing Cybersecurity for the City.

Training & Awareness

The section is split into two audiences

City Staff

The training (mandatory and optional) that City staff should be taking periodically to ensure they are fulfilling their role in protecting the city's assets and themselves. It also includes the various awareness activities and resources that must be made available to them.

Residents

While there will be no official formal training provided to our community, as a smart city, we owe it to our residents and to ourselves to arm them with as much knowledge as possible to protect their families from potential cyber predators. This will be in many forms such as public presentations and resources on our Web site.

Physical Security and BCP

This section deals with the city's physical security (buildings and other physical assets) and Business Continuity Planning, as well as subsequent Disaster Recovery activities in the event of a significant cyber event. This needs to tie into the broader plan which is managed by the Protective Services Department.

IT Systems

Although many associate Cybersecurity with IT systems only, they are but one part of the equation. With the advancements in technology and tools, it can often be the easier one to manage given the right resources.

Governance

This section is part of every section where it plays key vital roles such as:

- Approval of various policies and procedures;
- Identifying roles, Responsibilities and resources;
- Creating and managing appropriate Committees and Working Groups;
- Communicating the framework to all departments.

Risk Management

Like many organizations, we will be using a solid Risk Management both initially and, on every project, to ensure we are doing the following:

- Creating a Risk Management Process that can be used not only for Cyber Risk but other operational risks as well;
- Identifying all our risks as they pertain to Cybersecurity along with their rating and mitigation activities;
- Creating a formal Risk Registry to track our risks as well as all mitigation activities and statuses.

Detailed Plan

Introduction

This section describes, in detail, all the projects that we will be undertaking over the next several years with the following information:

- A description of the project;
- Who is involved;
- How it aligns with the NIST Framework (for future alignment and auditability)

While this section explains the WHAT, WHY and WHO, it does not go into the WHEN AND WHERE. The tentative timelines for these projects are outlined in the 3-year Action Plan that accompanies this plan. The Action Plan will be revised every year to ensure we are concentrating on the right priorities and ensuring the budget reflects the planned work.

Policies, Processes and Procedures

Policies and Processes would usually be a subset of the Governance function but for the time being, it has its own section is because of the lack of detailed IM/IT Policies that we currently have. Policies help us govern many of the activities within the city, so it is imperative to grow this section substantially in the first year so that we may have a base line of governance to align with.

Approach

The following approach will be taken with all policies & Processes:

- We will use the City's templates and procedures for all policies;
- We will create a Process template that will then be subsequently used for all process documentation;
- Processes must align with policies when applicable.
    - EXAMPLE: It is important to have a fully documented staff onboarding/offboarding process. It is equally important to have a policy that enforces the need to follow the process;
- All Policies will be approved by the Council and communicated to all staff.

- All IM/IT Security Processes will be approved by both the Chief Information officer and Directors who have shared accountability for the process (EX: HR for the Onboarding process);
- As Procedures tend to be operational and very specific. They will be created, reviewed and shared appropriately (EX: Procedure to connect with a VPN).

Current list of Policy, Process and Procedure Deliverables

The following is a list of the documents that are currently part of the plan. *

**Many initiatives will require us to create/modify plans over the next years such as Office365, Smart City Projects, etc.*

Policies

Document	Description	Owner(s)	NIST Activity
IM/IT Acceptable Use Policy	This is a complete revision of the current IT restrictions Policy to ensure it is up to date and reflects current Cybersecurity practices	IM/IT	Protect
Patch Management Policy	This New Policy outlines the requirements to ensure our systems and applications are patched in regular and timely fashion to reduce the chances of them being compromised.	IM/IT	Protect
Change Management Policy	This New Policy outlines the requirements of how change is introduced to our IT Systems environments on premise and in the cloud.	IM/IT	Protect
Cellular & Mobile Computing Policy	This is a complete revision of the Cell phone Policy to ensure it is current and includes other mobile devices as well as remote connectivity	IM/IT	Protect
Cloud Storage Policy	This new Policy outlines the rules and expectations as they pertain to using offsite (cloud) storage for City assets.	IM/IT	Protect
Staff On/Offboarding Policy	This new Policy outlines the requirements for onboarding new employees as well as offboarding employees that are leaving the City.	IM/IT and Human Resources	Protect
Security Training Policy	This new Policy outlines the Requirements as they pertain to staff obligations for training & awareness activities	IM/IT, CAO and All Directors	Protect
Security incident Reporting Policy	This new Policy outlines the requirements to properly report any IM/IT Security incidents that may occur.	IM/IT	Recover
IM/IT Monitoring Policy	This new policy outlines the requirements for tracking specific metrics and Performance Indicators that provide an overview of all IT health, including Cybersecurity.	IM/IT	Identify
Social Networking Policy	This policy addresses use of various Social Media platforms such as Facebook, YouTube, etc..	IM/IT and Comms	Protect

Processes

Document	Description	Owner(s)	NIST Activity
Staff Onboarding Process	This document outlines the detailed process that is followed when new staff members join the City	HR, All departments	Protect
Staff Offboarding Process	This document outlines the detailed process that is followed when a staff member leaves the City (both planned and unplanned)	HR, All departments	Protect
IT Patch Management Process	This document outlines all the system patching occurring and when.	IM/IT	Protect
IT Change Management Process	This document outlines the process followed to introduce change into our production environment.	IM/IT	Protect
IM/IT Engagement Process	This document outlines the process staff need to follow to get IT services including projects, incidents, emergencies, etc..	IM/IT	Identify

Procedures

Document	Description	Owner(s)	NIST Activity
Guidelines for a safe Web experience	This document will outline some general guidelines to navigate and work on the web in a safe way.	IM/IT	Protect

Training and Awareness

Probably the most overlooked area of focus over the last decade even though user behavior accounts for over 90% of cyber incidents because of lack of knowledge and awareness.

Approach

As mentioned in the previous section, this activity will address two different audiences:

- City Staff
- Residents of Clarence-Rockland

City Staff

Since staff share the responsibility of ensuring our assets and have some sort of access to these assets including the network, facilities and data, they are the primary focus of the Training and Awareness Program. This Program will include:

- Mandatory training for all employees of the City whether they are full-time, part-time, City Councillors or any other temporary employee/consultant that can access any of the assets. The delivery of the training will be determined in the fall but will most likely be online;
- Other awareness activities such as information sessions, webinars and presentations that staff will the option to participate in;
- An online Cybersecurity Resource Centre that includes multiple links and information from various expert agencies such as the CSE, OPP and RCMP.

Residents

While the City cannot take responsibility for the online habits of its citizens, we believe that an informed City is a strong City and a SMART City. As such, we will be providing the following activities to residents as part of the program:

- Public Cybersecurity 101 classes in both official languages. The exact content, schedule and frequency of these sessions will be communicated in the fall of 2019.
- Online Cybersecurity resources on our Web site for residents to visit at their convenience.

Current list of Training & Awareness Deliverables

The following are lists of the initiatives are that currently part of the plan. *

Document	Description	Owner(s)	NIST Activity
Cybersecurity Training Plan	A document that outlines the approach the City will take to ensure all staff are properly trained. It will align with the Cybersecurity Training Policy. There will be a special section for IM/IT Staff as their training needs are obviously greater given their mandate to support this plan.	IM/IT	Protect
Cybersecurity 101 Presentations	These presentations will be offered in both languages to our residents. They will include good cyber practices and hygiene as information on resources they can leverage.	IM/IT Comms	Protect
Cybersecurity Resource Centre	A web portal/page dedicated to cybersecurity awareness including information from various agencies and security organizations.	IM/IT Comms	Protect

Physical Security and Business Continuity Planning (BCP)

This area comprises activities that are not completely IM/IT specific and require coordinating with other departments.

- Any activities around physical security require coordinating with building management, protective services and public works;
- Activities around BCP must align with the overall Emergency Management planning and practices.

Approach

Apart some specific projects that have already been approved and funded, the initial projects in this area will comprise of evaluating what the needs and requirements of the City are.
EX: We could invest time and funds into a Disaster Recovery solution only to find out that it does not meet the needs of the business

Current list of Physical Security & BCP Deliverables

The following are lists of the Initiatives that are currently part of the plan. *

Document	Description	Owner(s)	NIST Activity
Cybersecurity Incident Management process	The process that is followed when a cyber incident occurs.	IM/IT	Respond
Cybersecurity Incident Report	The report that is used to document all aspects of a cybersecurity incident including communications, root cause analysis, post mortem, etc..	IM/IT	Respond
Departmental Business Impact Analysis for BCP events	A complete and documented analysis of the needs and potential impacts of every department in the case of a cyber related BCP event. This will be part of an over-arching BCP for the City.	IM/IT Prot. Serv.	Respond
Start yearly BCP tests	These are formal tests of our BCP processes and responses. They are critical to ascertain if the plan and business impacts are aligned. (often done as table top exercise)	IM/IT Prot. Serv.	Respond
Physical Security Architecture	A documented review of the current physical architecture including all door access, cameras and alarms for all the City's assets.	IM/IT Prot. Serv. Building mgt	Identify

IM/IT Systems

This area comprises activities that are related to the actual tools and technologies used for cybersecurity purposes

Approach

This section currently includes some initial initiatives that will help shape the remainder of the Action plan along with the third-party assessment.

Current list of IM/IT Systems Deliverables

The following are lists of the Initiatives that are currently part of the plan. *

Document	Description	Owner(s)	NIST Activity
IT systems Architecture	A revised set of complete system architecture that can be referenced in other initiatives	IM/IT	Identify
Cybersecurity Architecture	A revised set of security architecture specific to cybersecurity	IM/IT	Identify
Vulnerability Assessment	Third-party assessment of the City's security posture	IM/IT	Identify
Full Inventory	A complete inventory of all IT systems	IM/IT	Identify
Review of Monitoring, Metrics and KPIs	A review of the way we monitor our systems as well as the metrics and KPIs we use do to so.	IM/IT	Identify
Review of practices, processes and procedures	A complete review of the various practice in IT that can impact cybersecurity	IM/IT	Identify

3-Year Action Plan

Once the plan is addressed, we will begin the detailed planning of all the activities. Once we perform the third-party Security Assessment, the recommendations that result from it will also feed into the Action Plan.

An initial Action plan will be produced by end of October 2019

Appendix A - Glossary

Taken from the following site:

https://www.globalknowledge.com/ca-en/topics/cybersecurity/glossary-of-terms/

access control — The means and mechanisms of managing access to and use of resources by users. There are three primary forms of access control: DAC, MAC, and RBAC. DAC (Discretionary Access Control) manages access through the use of on-object ACLs (Access Control Lists), which indicate which users have been granted (or denied) specific privileges or permissions on that object. MAC (Mandatory Access Control) restricts access by assigning each subject and object a classification or clearance level label; resource use is then controlled by limiting access to those subjects with equal or superior labels to that of the object. RBAC (Role Base Access Control) controls access through the use of job labels, which have been assigned the permissions and privilege needed to accomplish the related job tasks. (Also known as authorization.)

anti-virus (anti-malware) — A security program designed to monitor a system for malicious software. Once malware is detected, the AV program will attempt to remove the offending item from the system or may simply quarantine the file for further analysis by an administrator. It is important to keep AV software detection databases current in order to have the best chance of detecting known forms of malware.

antivirus software — A software program that monitors a computer system or network communications for known examples of malicious code and then attempts to remove or quarantine the offending items. (Also known as Malware Scanner.) Most anti-virus (AV) products use a pattern recognition or signature matching system to detect the presence of known malicious code. Some AV products have adopted technologies to potentially detect new and unknown malware. These technologies include anomaly detection (i.e. watch for programs which violate specific rules), behavioral detection (i.e. watch for programs that have behaviors that are different from the normal baseline of behavior of the system), and heuristic detection (i.e. watch for programs that exhibit actions which are known to be those of confirmed malware; it is a type of technological profiling).

APT (Advanced Persistent Threat) — A security breach that enables an attacker to gain access or control over a system for an extended period of time usually without the owner of the system being aware of the violation. Often an APT takes advantage of numerous unknown vulnerabilities or zero day attacks, which allow the attacker to maintain access to the target even as some attack vectors are blocked.

asset — Anything that is used in and is necessary to the completion of a business task. Assets include both tangible and intangible items such as equipment, software code, data, facilities, personnel, market value and public opinion.

authentication — The process of proving an individual is a claimed identity. Authentication is the first element of the AAA services concept, which includes Authentication, Authorization, and Accounting. Authentication occurs after the initial step of identification (i.e. claiming an identity). Authentication is accomplished by providing one or more authentication factors—Type 1: something you know (e.g. password, PIN, or combination), Type 2: something you have (e.g. smart card, RSA SecureID FOB, or

USB drive), and Type 3: something you are (e.g. biometrics—fingerprint, iris scan, retina scan, hand geometry, signature verification, voice recognition, and keystroke dynamics).

authorization — The security mechanism determining and enforcing what authenticated users are authorized to do within a computer system. The dominant forms of authorization are DAC, MAC and RBAC. DAC (Discretionary Access Control) manages access using ACL (Access Control Lists) on each resource object where users are listed along with the permissions or privileges granted or denied them. MAC (Mandatory Access Control) manages access using labels of classification or clearance on both subjects and objects, and only those subjects with equal or superior clearance are allowed to access resources. RBAC (Role Based Access Control) manages access using labels of a job role that has been granted the permissions and privileges needed to accomplish a specific job or role.

backing up — Creating a duplicate copy of data onto a separate physical storage device or online/cloud storage solution. A backup is the only insurance against data loss. With a backup, damaged or lost data files can be restored. Backups should be created on a regular, periodic basis such as daily. A common strategy is based on the 3-2-1 rule: you should have three copies of your data - the original and 2 backups; you should use 2 different types of media (such as a physical media (such as a hard drive or tape) and a cloud storage solution); and do not store the three copies of data in 1 plane (i.e. backups should be stored offsite). It is important to store backups for disaster recovery at an offsite location in order to insure they are not damaged by the same event that would damage the primary production location. However, additional onsite backups can be retained for resolving minor issues such as accidental file deletion or hard drive failure.

BCP (Business Continuity Planning) — A business management plan used to resolve issues that threaten core business tasks. (Also known as Business Continuity Management.) The goal of BCP is to prevent the failure of mission critical processes when they have be harmed by a breach or accident. Once core business tasks have been stabilized, BCP dictates the procedure to return the environment back to normal conditions. BCP is used when the normal security policy has failed to prevent harm from occurring, but before the harm has reached the level of fully interrupting mission critical processes, which would trigger the Disaster Recovery Process (DRP).

behavior monitoring — Recording the events and activities of a system and its users. The recorded events are compared against security policy and behavioral baselines to evaluate compliance and/or discover violations. Behavioral monitoring can include the tracking of trends, setting of thresholds and defining responses. Trend tracking can reveal when errors are increasing requiring technical support services, when abnormal load levels occur indicating the presence of malicious code, or when production work levels increase indicating a need to expand capacity. Thresholds are used to define the levels of activity or events above which are of concern and require a response. The levels below the threshold are recorded but do not trigger a response. Responses can be to resolve conflicts, handle violations, prevent downtime or improve capabilities.

blacklist — A security mechanism prohibiting the execution of those programs on a known malicious or undesired list of software. The blacklist is a list of specific files known to be malicious or otherwise are unwanted. Any program on the list is prohibited from executing while any other program, whether benign or malicious, is allowed to execute by default. (See whitelist.)

block cipher — A type of symmetric encryption algorithm that divides data into fixed length sections and then performs the encryption or decryption operation on each block. The action of dividing a data set into blocks enables the algorithm to encrypt data of any size.

botnet — A collection of innocent computers which have been compromised by malicious code to run a remote-control agent granting an attacker the ability to remotely take advantage of the system's resources to perform illicit or criminal actions. These actions include DoS flooding attacks, hosting false Web services, spoofing DNS, transmitting SPAM, eavesdropping on network communications, recording VOIP communications and attempting to crack encryption or password hashes. Botnets can be comprised of dozens to over a million individual computers. The term botnet is a shortened form of robotic network.

bug — An error or mistake in software coding or hardware design or construction. A bug represents a flaw or vulnerability in a system discoverable by attackers and used as point of compromise. Attacks often use fuzzing technique (i.e. randomize testing tools) to locate previously unknown bugs to craft new exploits.

BYOD (Bring Your Own Device) — A company's security policy dictating whether workers can bring in their own devices into the work environment, whether such devices can be connected to the company network and to what extent that connection allows interaction with company resources. A BYOD policy can range from complete prohibition of personal devices being brought into the facility to allowing any device to be connected to the company network with full access to all company resources. Generally, a BYOD policy puts reasonable security limitations on which devices can be used on company property and severely limits access to sensitive company network resources. BYOD should address concerns such as data ownership, asset tracking, geo location, patching and upgrades, security applications (such as malware scanners, firewalls and IDS), storage segmentation, appropriate vs inappropriate applications, on-boarding, off-boarding, repair/replacement due to damage, legal concerns, internal investigations and law enforcement investigations and forensics.

ciphertext — The unintelligible and seeming random form of data that is produced by the cryptographic function of encryption. Ciphertext is produced by a symmetric algorithm when a data set is transformed by the encryption process using a selected key. Ciphertext can converted back into its original form (i.e. plain text) by performing the decryption process using the same symmetric encryption algorithm and the key used during the encryption process. (Also known as cryptogram.)

clickjacking — A malicious technique by which a victim is tricked into clicking on a URL, button or other screen object other than that intended by or perceived by the user. Clickjacking can be performed in many ways; one of which is to load a web page transparently behind another visible page in such a way that the obvious links and objects to click are facades, so clicking on an obvious link causes the hidden page's link to be selected.

cloud computing — A means to offer computing services to the public or for internal use through remote services. Most cloud computing systems are based on remote virtualization where the application or operating environment offered to customers is hosted on the cloud provider's computer hardware. There are a wide range of cloud solutions including software applications (examples include e-mail and document editing), custom code hosting (namely execution platforms and web services) as well as full system replacements (such as remote virtual services to host

databases or file storage). (See SaaS, PaaS, and IaaS.) Most forms of cloud computing are considered public cloud as they are provided by a third party. However, private cloud (internally hosted), community cloud (a group of companies' privately hosted cloud), a hosted private cloud (the cloud servers are owned and managed by a third party but hosted in the facility of the customer) and hybrid cloud (a mixture of public and private) are also options.

CND (Computer Network Defense) — The establishment of a security perimeter and of internal security requirements with the goal of defending a network against cyberattacks, intrusions and other violations. A CND is defined by a security policy and can be stress tested using vulnerability assessment and penetration testing measures.

cracker — The proper term to refer to an unauthorized attacker of computers, networks and technology instead of the misused term “hacker.” However, this term is not as widely used in the media; thus, the term hacker has become more prominent in-spite of the terms misuse. (See hacker.)

critical infrastructure — The physical or virtual systems and assets that are vital to an organization or country. If these systems are compromised, the result would be catastrophic. If an organization's mission critical processes are interrupted, this could result in the organization ceasing to exist. If a country's critical infrastructure is destroyed, it will have severe negative impact on national security, economic stability, citizen safety and health, transportation and communications.

CVE (Common Vulnerabilities and Exposures) — An online database of attacks, exploits and compromises operated by the MITRE organization for the benefit of the public. It includes all attacks and abuses known for any type of computer system or software product. Often new attacks and exploits are documented in a CVE long before a vendor admits to the issue or releases an update or patch to resolve the concern.

cryptography — The application of mathematical processes on data-at-rest and data-in-transit to provide the security benefits of confidentiality, authentication, integrity and non-repudiation. Cryptography includes three primary components: symmetric encryption, asymmetric encryption and hashing. Symmetric encryption is used to provide confidentiality. Asymmetric encryption is used to provide secure symmetric key generation, secure symmetric key exchange (via digital envelopes created using the recipient's public key) verification of source, verification/control of recipient, digital signature (a combination of hashing and use of the sender's private key) and digital certificates (which provides third-party authentication services). Hashing is the cryptographic operation that produces a representational value from an input data set. A before and after hash can be compared to detect protection of or violation of integrity.

cyberattack — Any attempt to violate the security perimeter of a logical environment. An attack can focus on gathering information, damaging business processes, exploiting flaws, monitoring targets, interrupting business tasks, extracting value, causing damage to logical or physical assets or using system resources to support attacks against other targets. Cyberattacks can be initiated through exploitation of a vulnerability in a publicly exposed service, through tricking a user into opening an infectious attachment, or even causing automated installation of exploitation tools through innocent website visits. (Also known as drive-by download.)

cyber ecosystem — The collection of computers, networks, communication pathways, software, data and users that comprise either a local private network or the world-wide Internet. It is the digital environment within which software operates and data is manipulated and exchanged.

cyberespionage — The unethical act of violating the privacy and security of an organization to leak data or disclose internal/private/confidential information. Cyberespionage can be performed by individuals, organization or governments for the direct purpose of causing harm to the violated entity to benefit individuals, organizations or governments.

cybersecurity — The efforts to design, implement, and maintain security for an organization's network, which is connected to the Internet. It is a combination of logical/technical-, physical- and personnel-focused countermeasures, safeguards and security controls. An organization's cybersecurity should be defined in a security policy, verified through evaluation techniques (such as vulnerability assessment and penetration testing) and revised, updated and improved over time as the organization evolves and as new threats are discovered.

cyber teams — Groups of professional or amateur penetration testing specialists who are tasked with evaluating and potentially improving the security stance of an organization. Common cyber teams include the red, blue and purple/white teams. A red team is often used as part of a multi-team penetration test (i.e. security evaluation), which is responsible for attacking the target which is being defended by the blue team. A purple team or white team is either used as a reference between the attack/red and defense/blue teams; or this team can be used as an interpreter of the results and activities of the red and blue teams to maximize their effectiveness in the results.

data breach — The occurrence of disclosure of confidential information, access to confidential information, destruction of data assets or abusive use of a private IT environment. Generally, a data breach results in internal data being made accessible to external entities without authorization.

data integrity — A security benefit that verifies data is unmodified and therefore original, complete and intact. Integrity is verified using cryptographic hashing. A hashing algorithm generates a fixed length output known as a hash value, fingerprint or MAC (Message Authenticating Code), which is derived from the input data, but which does not contain the input data. This makes hashing a one-way operation. A hash is calculated before an event, and another hash is calculated after the event (an event can be a time frame of storage (i.e. data-at-rest) or an occurrence of transmission (i.e. data-in-transit); the two hashes are then compared using an XOR Boolean operation. If the two hashes exactly match (i.e. the XOR result is zero), then the data has retained its integrity. However, if the two hashes do not match exactly (i.e. the XOR result is a non-zero value), then something about the data changed during the event.

data mining — The activity of analyzing and/or searching through data to find items of relevance, significance or value. The results of data mining are known as meta-data. Data mining can be a discovery of individual important data items, a summary or overview of numerous data items or a consolidation or clarification of a collection of data items.

data theft — The act of intentionally stealing data. Data theft can occur via data loss (physical theft) or data leakage (logical theft) event. Data loss occurs when a storage device is lost or stolen. Data leakage occurs when copies of data is possessed by unauthorized entities.

DDoS (Distributed Denial of Service) Attack — An attack which attempts to block access to and use of a resource. It is a violation of availability. DDOS (or DDoS) is a variation of the DoS attack (see DOS) and can include flooding attacks, connection exhaustion, and resource demand. The distinction of

DDOS from DOS is that the attack traffic may originate from numerous sources or is reflected or bounced off numerous intermediary systems. The purpose of a DDoS attack is to significantly amplify the level of the attack beyond that which can be generated by a single attack system to overload larger and more protected victims. DDoS attacks are often waged using botnets. (See botnet.)

decrypt — The act which transforms ciphertext (i.e. the unintelligible and seeming random form of data that is produced by the cryptographic function of encryption) back into its original plaintext or cleartext form. Ciphertext is produced by a symmetric encryption algorithm when a data set is transformed by the encryption process using a selected key. Ciphertext can converted back into its original form (i.e. plaintext) by performing the decryption process using the same symmetric encryption algorithm and the same key used during the encryption process.

digital certificate — A means by which to prove identity or provide authentication commonly by means of a trusted third-party entity known as a certificate authority. A digital certificate is based on the x.509 v3 standard. It is the public key of a subject signed by the private key of a certificate authority with clarifying text information such as issuer, subject identity, date of creation, date of expiration, algorithms, serial number and thumbprint (i.e. hash value).

digital forensics — The means of gathering digital information to be used as evidence in a legal procedure. Digital forensics focuses on gathering, preserving and analyzing the fragile and volatile data from a computer system and/or network. Computer data that is relevant to a security breach and/or criminal action is often intermixed with standard benign data from business functions and personal activities. Thus, digital forensics can be challenging to properly collect relevant evidence while complying with the rules of evidence to ensure that such collected evidence is admissible in court.

DLP (Data Loss Prevention) — A collection of security mechanisms which aim at preventing the occurrence of data loss and/or data leakage. Data loss occurs when a storage device is lost or stolen while data leakage occurs when copies of data is possessed by unauthorized entities. In both cases, data is accessible to those who should not have access. DLP aims at preventing such occurrences through various techniques such as strict access controls on resources, blocking the use of email attachments, preventing network file exchange to external systems, blocking cut-and-paste, disabling use of social networks and encrypting stored data.

DMZ (Demilitarized Zone) — A segment or subnet of a private network where resources are hosted and accessed by the public from the Internet. The DMZ is isolated from the private network using a firewall and is protected from obvious abuses and attacks from the Internet using a firewall. A DMZ can be deployed in two main configurations. One method is the screened subnet configuration, which has the structure of I-F-DMZ-F-LAN (i.e. internet, then firewall, then the DMZ, then another firewall, then the private LAN). A second method is the multi-homed firewall configuration, which has the structure of a single firewall with three interfaces, one connecting to the Internet, a second to the DMZ, and a third to the private LAN.

DOS (Denial of Service) — An attack that attempts to block access to and use of a resource. It is a violation of availability. DOS (or DoS) attacks include flooding attacks, connection exhaustion and resource demand. A flooding attack sends massive amounts of network traffic to the target overloading the ability of network devices and servers to handle the raw load. Connection exhaustion repeatedly makes connection requests to a target to consume all system resources related to

connections, which prevents any other connections from being established or maintained. A resource demand DoS repeatedly requests a resource from a server to keep it too busy to respond to other requests.

drive-by download — A type of web-based attack that automatically occurs based on the simple act of visiting a malicious or compromised/poisoned Web site. A drive-by download is accomplished by taking advantage of the default nature of a Web browser to execute mobile code, most often JavaScript, with little to no security restrictions. A drive-by download can install tracking tools, remote access backdoors, botnet agents, keystroke loggers or other forms of malicious utilities. In most cases, the occurrence of the infection based on the drive-by download is unnoticed by the user/victim.

eavesdropping — The act of listening in on a transaction, communication, data transfer or conversation. Eavesdropping can be used to refer to both data packet capture on a network link (also known as sniffing or packet capture) and to audio recording using a microphone (or listening with ears).

encode — The act which transforms plaintext or cleartext (i.e. the original form of normal standard data) into ciphertext (i.e. the unintelligible and seeming random form of data that is produced by the cryptographic function of encryption). Ciphertext is produced by a symmetric encryption algorithm when a data set is transformed by the encryption process using a selected key (i.e. to encrypt or encode). Ciphertext can converted back into its original form (i.e. plaintext) by performing the decryption process using the same symmetric encryption algorithm and the same key used during the encryption process (i.e. decrypt or decode).

encryption key — The secret number value used by a symmetric encryption algorithm to control the encryption and decryption process. A key is a number defined by its length in binary digits. Generally, the longer the key length, the more security (i.e. defense against confidentiality breaches) it provides. The length of the key also determines the key space, which is the range of values between the binary digits being all zeros and all ones from which the key can be selected.

firewall — A security tool, which may be a hardware or software solution that is used to filter network traffic. A firewall is based on an implicit deny stance where all traffic is blocked by default. Rules, filters or ACLs can be defined to indicate which traffic can cross the firewall. Advanced firewalls can make allow/deny decisions based on user authentication, protocol, header values and even payload contents.

hacker — A person who has knowledge and skill in analyzing program code or a computer system, modifying its functions or operations and altering its abilities and capabilities. A hacker may be ethical and authorized (the original definition) or may be malicious and unauthorized (the altered but current use of the term). Hackers can range from professionals who are skilled programmers to those who have little to no knowledge of the specifics of a system or exploit but who can follow directions; in this instance, they are called script kiddies.

hacktivism — Attackers who hack for a cause or belief rather than some form of personal gain. Hacktivism is often viewed by attackers as a form of protest or fighting for their perceived "right" or "justice." However, it is still an illegal action in most cases when the victim's technology or data is abused, harmed or destroyed.

honeypot — A trap or decoy for attackers. A honeypot is used to distract attackers to prevent them from attacking actual production systems. It is a false system that is configured to look and function as a production system and is positioned where it would be encountered by an unauthorized entity who is seeking out a connection or attack point. A honeypot may contain false data to trick attackers into spending considerable time and effort attacking and exploiting the false system. A honeypot may also be able to discover new attacks or the identity of the attackers.

IaaS (Infrastructure-as-a-Service) — A type of cloud computing service where the provider offers the customer the ability to craft virtual networks within their computing environment. An IaaS solution enables a customer to select which operating systems to install into virtual machines/nodes as well as the structure of the network including use of virtual switches, routers and firewalls. It also provides complete freedom as to the software or custom code run on the virtual machines. An IaaS solution is the most flexible of all the cloud computing services; it allows for significant reduction in hardware by the customer in their own local facility. It is the most expensive form of cloud computing service.

identity cloning — A form of identity theft in which the attacker takes on the identity of a victim and then attempts to live and act as the stolen identity. Identity cloning is often performed to hide the birth country or a criminal record of the attacker to obtain a job, credit or other secured financial instrument.

identity fraud — A form of identity theft in which a transaction, typically financial, is performed using the stolen identity of another individual. The fraud is due to the attacker impersonating someone else.

IDS (Intrusion Detection System) — A security tool that attempts to detect the presence of intruders or the occurrence of security violations to notify administrators, enable more detailed or focused logging or even trigger a response such as disconnecting a session or blocking an IP address. An IDS is considered a more passive security tool as it detects compromises after they are already occurring rather than preventing them from becoming successful.

information security policy — A written account of the security strategy and goals of an organization. A security policy is usually comprised of standards, policies (or SOPs – Standard Operating Procedures) and guidelines. All hardware, software, facilities and personnel must abide by the terms of the security policy of an organization. (Also known as security policy.)

insider threat — The likelihood or potential that an employee or another form of internal personnel may pose a risk to the stability or security of an organization. An insider has both physical access and logical access (through their network logon credentials). These are the two types of access that an outside attacker must first gain before launching malicious attacks whereas an insider already has both forms of access. Thus, an insider is potentially a bigger risk than an outsider if that insider goes rogue or is tricked into causing harm.

IPS (Intrusion Prevention System) — A security tool that attempts to detect the attempt to compromise the security of a target and then prevent that attack from becoming successful. An IPS is considered a more active security tool as it attempts to proactively respond to potential threats. An IPS can block IP addresses, turn off services, block ports and disconnect sessions as well as notify administrators.

ISP (Internet Service Provider) — The organization that provides connectivity to the Internet for individuals or companies. Some ISPs offer additional services above that of just connectivity such as e-mail, web hosting and domain registration.

JBOH (JavaScript-Binding-Over-HTTP) — A form of Android-focused mobile device attack that enables an attacker to be able to initiate the execution of arbitrary code on a compromised device. A JBOH attack often takes place or is facilitated through compromised or malicious apps.

keylogger — Any means by which the keystrokes of a victim are recorded as they are typed into the physical keyboard. A keylogger can be a software solution or a hardware device used to capture anything that a user might type in including passwords, answers to secret questions or details and information form e-mails, chats and documents.

LAN (Local Area Network) — An interconnection of devices (i.e. a network) that is contained within a limited geographic area (typically a single building). For a typical LAN, all the network cables or interconnection media is owned and controlled by the organization unlike a WAN (Wide Area Network) where the interconnection media is owned by a third party.

link jacking — A potentially unethical practice of redirecting a link to a middle-man or aggregator site or location rather than the original site the link seemed to indicate it was directed towards. For example, a news aggregation service may publish links that seem as if they point to the original source of their posted articles, but when a user discovers those links via search or through social networks, the links redirect back to the aggregation site and not the original source of the article.

malware (malicious software) — Any code written for the specific purpose of causing harm, disclosing information or otherwise violating the security or stability of a system. Malware includes a wide range of types of malicious programs including: virus, worm, Trojan horse, logic bomb, backdoor, Remote Access Trojan (RAT), rootkit, ransomware and spyware/adware.

outsider threat — The likelihood or potential that an outside entity, such as an ex-employee, competitor or even an unhappy customer, may pose a risk to the stability or security of an organization. An outsider must often gain logical or physical access to the target before launching malicious attacks.

outsourcing — The action of obtaining services from an external entity. Rather than performing certain tasks and internal functions, outsourcing enables an organization to take advantages of external entities that can provide services for a fee. Outsourcing is often used to obtain best-of-breed level service rather than settling for good-enough internal operations. It can be expensive and increases an organization's security risk due to the exposure of internal information and data to outsiders.

OWASP (Open Web Application Security Project) — An Internet community focused on understanding web technologies and exploitations. Their goal is to help anyone with a website improve the security of their site through defensive programming, design and configuration. Their approach includes understanding attacks to know how to defend against them. OWASP offers numerous tools and utilities related to website vulnerability evaluation and discovery as well as a significant amount of training and reference material related to all thing's web security.

PaaS (Platform-as-a-Service) — A type of cloud computing service where the provider offers the customer the ability to operate custom code or applications. A PaaS operator determines which operating systems or execution environments are offered. A PaaS system does not allow the customer to change operating systems, patch the OS or alter the virtual network space. A PaaS system allows the customer to reduce hardware deployment in their own local facility and to take advantage of on-demand computing (also known as pay as you go).

packet sniffing — The act of collecting frames or packets off a data network communication. This activity allows the evaluation of the header contents as well as the payload of network communications. Packet sniffing requires that the network interface card be placed into promiscuous mode to disable the MAC (Media Access Control) address filter which would otherwise discard any network communications not intended for the specific local network interface. (Also known as sniffing or eavesdropping.)

patch — An update or change or an operating system or application. A patch is often used to repair flaws or bugs in deployed code as well as introduce new features and capabilities. It is good security practice to test all updates and patches before implementation and attempt to stay current on patches to have the latest version of code that has the fewest known flaws and vulnerabilities.

patch management — The management activity related to researching, testing, approving and installing updates and patches to computer systems, which includes firmware, operating systems and applications. A patch is an update, correction, improvement or expansion of an existing software product through the application of new code issued by the vendor. Patch management is an essential part of security management to prevent downtime, minimize vulnerabilities and prevent new untested updates from interfering with productivity.

payment card skimmers — A malicious device used to read the contents of an ATM, debit or credit card when inserted into a POS (Point of Sale) payment system. A skimmer may be an internal component or an external addition. An attacker will attempt to use whatever means to imbed their skimmer into a payment system that will have the highest likelihood of not being detected and thus gather the most amount of financial information from victims. (See POS intrusions.)

pen testing — A means of security evaluation where automated tools and manual exploitations are performed by security and attack experts. This is an advanced form of security assessment that should only be used by environments with a mature security infrastructure. A penetration test will use the same tools, techniques and methodologies as criminal hackers, and thus, it can cause downtime and system damage. However, such evaluations can assist with securing a network by discovering flaws that are not visible to automated tools based on human (i.e. social engineering) or physical attack concepts. (Also known as penetration testing or ethical hacking.)

phishing — A social engineering attack that attempts to collect information from victims. Phishing attacks can take place over e-mail, text messages, through social networks or via smart phone apps. The goal of a phishing attack may be to learn logon credentials, credit card information, system configuration details or other company, network, computer or personal identity information. Phishing attacks are often successful because they mimic legitimate communications from trusted entities or groups such as false emails from a bank or a retail website.

PKI (Public Key Infrastructure) — A security framework (i.e. a recipe) for using cryptographic concepts in support of secure communications, storage and job tasks. A PKI solution is a combination of symmetric encryption, asymmetric encryption, hashing and digital certificate-based authentication.

POS (Point of Sale) intrusions — An attack that gains access to the POS (Point of Sale) devices at a retail outlet enabling an attacker to learn payment card information as well as other customer details. POS intrusions can occur against a traditional brick-and-mortar retail location as well as any online retail websites. (See payment card skimmers.)

ransomware — A form of malware that holds a victim's data hostage on their computer typically through robust encryption. This is followed by a demand for payment in the form of Bitcoin (an untraceable digital currency) to release control of the captured data back to the user.

restore — The process of returning a system back to a state of normalcy. A restore or restoration process may involve formatting the main storage device before re-installing the operating system and applications as well as copying data from backups onto the reconstituted system.

risk assessment — The process of evaluating the state of risk of an organization. Risk assessment is often initiated through taking an inventory of all assets, assigning each asset a value, and then considering any potential threats against each asset. Threats are evaluated for their exposure factor (EF) (i.e. the amount of loss that would be caused by the threat causing harm) and frequency of occurrence (i.e. ARO—Annualized Rate of Occurrence) to calculate a relative risk value known as the ALE (Annualized Loss Expectancy). The largest ALE indicates the biggest concern or risk for the organization.

risk management — The process of performing a risk assessment and evaluating the responses to risk to mitigate or otherwise handle the identified risks. Countermeasures, safeguards or security controls are to be selected that may eliminate or reduce risk, assign or transfer risk to others (i.e. outsourcing or buying insurance) or avoid and deter risk. The goal is to reduce risk down to an acceptable or tolerable level.

SaaS (Software-as-a-Service) — A type of cloud computing service where the provider offers the customer the ability to use a provided application. Examples of a SaaS include online e-mail services or online document editing systems. A user of a SaaS solution is only able to use the offered application and make minor configuration tweaks. The SaaS provider is responsible for maintaining the application.

sandboxing — A means of isolating applications, code or entire operating systems to perform testing or evaluation. The sandbox limits the actions and resources available to the constrained item. This allows for the isolated item to be used for evaluation while preventing any harm or damage to be caused to the host system or related data or storage devices.

SCADA (Supervisory Control and Data Acquisition) — A complex mechanism used to gather data and physical world metrics as well as perform measurement or management actions of the monitored systems for the purposes of automatic large complex real-world processes such as oil refining, nuclear power generation or water filtration. SCADA can provide automated control over very large complex systems whether concentrated in a single physical location or spread across long distances.

security control — Anything used as part of a security response strategy which addresses a threat to reduce risk. (Also known as countermeasure or safeguard.)

security perimeter — The boundary of a network or private environment where specific security policies and rules are enforced. The systems and users within the security boundary are forced into compliance with local security rules while anything outside is not under such restrictions. The security perimeter prevents any interactions between outside entities and internal entities that might violate or threaten the security of the internal systems.

SIEM (Security Information and Event Management) — A formal process by which the security of an organization is monitored and evaluated on a constant basis. SIEM helps to automatically identify systems that are out of compliance with the security policy as well as to notify the IRT (Incident Response Team) of any security violating events.

sniffing — See packet sniffing and eavesdropping.

social engineering — An attack focusing on people rather than technology. This type of attack is psychological and aims to either gain access to information or to a logical or physical environment. A social engineering attack may be used to gain access to a facility by tricking a worker into assisting by holding the door when making a delivery, gaining access into a network by tricking a user into revealing their account credentials to the false technical support staff or gaining copies of data files by encouraging a worker to cut-and-paste confidential materials into an e-mail or social networking post.

SPAM — A form of unwanted or unsolicited messages or communications typically received via e-mail but also occurring through text messaging, social networks or VoIP. Most SPAM is advertising, but some may include malicious code, malicious hyperlinks or malicious attachments.

spear phishing — A form of social engineering attack that is targeted to victims who have an existing digital relationship with an online entity such as a bank or retail website. A spear phishing message is often an e-mail although there are also text message and VoIP spear phishing attacks as well, which looks exactly like a legitimate communication from a trusted entity. The attack tricks the victim into

clicking on a hyperlink to visit a company website only to be re-directed to a false version of the website operated by attackers. The false website will often look and operate similarly to the legitimate site and focus on having the victim provide their logon credentials and potentially other personal identity information such as answers to their security questions, an account number, their social security number, mailing address, email address and/or phone number. The goal of a spear phishing attack is to steal identity information for account takeover or identity theft.

spoof (spoofing) — The act of falsifying the identity of the source of a communication or interaction. It is possible to spoof IP address, MAC address and email address.

spyware — A form of malware that monitors user activities and reports them to an external their party. Spyware can be legitimate in that it is operated by an advertising and marketing agency for gathering customer demographics. However, spyware can also be operated by attackers using the data gathering tool to steal an identity or learn enough about a victim to harm them in other ways.

supply chain — The path of linked organizations involved in the process of transforming original or raw materials into a finished product that is delivered to a customer. An interruption of the supply chain can cause a termination of the production of the final product immediately or this effect might not be noticed until the materials already in transit across the supply chain are exhausted.

threat assessment — The process of evaluating the actions, events and behaviors that can cause harm to an asset or organization. Threat assessment is an element of risk assessment and management. (Also known as threat modeling and threat inventory.)

Trojan Horse (Trojan) — A form of malware where a malicious payload is imbedded inside of a benign host file. The victim is tricked into believing that the only file being retrieved is the viewable benign host. However, when the victim uses the host file, the malicious payload is automatically deposited onto their computer system.

two-factor authentication — The means of proving identity using two authentication factors usually considered stronger than any single factor authentication. A form of multi-factor authentication. Valid factors for authentication include Type 1: Something you know such as passwords and PINs; Type 2: Something you have such as smart cards or OTP (One Time Password) devices; and Type 3: Someone you are such as fingerprints or retina scans (aka biometrics).

two-step authentication — A means of authentication commonly employed on websites as an improvement over single factor authentication but not as robust as two-factor authentication. This form of authentication requires the visitor provide their username (i.e. claim an identity) and password (i.e. the single factor authentication) before performing an additional step. The additional step could be receiving a text message with a code, then typing that code back into the website for confirmation. Alternatives include receiving an e-mail and needing to click on a link in the message for confirmation or viewing a pre-selected image and statement before typing in another password or PIN. Two-step is not as secure as two-factor because the system provides one of the factors to the user at the time of logon rather than requiring that the user provide both.

unauthorized access — Any access or use of a computer system, network or resource which is in violation of the company security policy or when the person or user was not explicitly granted authorization to access or use the resource or system

VPN (Virtual Private Network) — A communication link between systems or networks that is typically encrypted to provide a secured, private, isolate pathway of communications.

virus — A form of malware that often attaches itself to a host file or the MBR (Master Boot Record) as a parasite. When the host file or MBR is accessed, it activates the virus enabling it to infect other objects. Most viruses spread through human activity within and between computers. A virus is typically designed to damage or destroy data, but different viruses implement their attack at different rates, speeds or targets. For example, some viruses attempt to destroy files on a computer as quickly as possible while others may do so slowly over hours or days. Others might only target images or Word documents (.doc/.docx).

vishing — A form of phishing attack which takes place over VoIP. In this attack, the attacker uses VoIP systems to be able to call any phone number with no toll-charge expense. The attacker often falsifies their caller-ID to trick the victim into believing they are receiving a phone call from a legitimate or trustworthy source such as a bank, retail outlet, law enforcement or charity. The victims do not need to be using VoIP themselves to be attacked over their phone system by a vishing attack. (See phishing.)

vulnerability — Any weakness in an asset or security protection which would allow for a threat to cause harm. It may be a flaw in coding, a mistake in configuration, a limitation of scope or capability, an error in architecture, design, or logic or a clever abuse of valid systems and their functions.

whitelist — A security mechanism prohibiting the execution of any program that is not on a pre-approved list of software. The whitelist is often a list of the file name, path, file size and hash value of the approved software. Any code that is not on the list, whether benign or malicious, will not be able to execute on the protected system. (See blacklist.)

Wi-Fi — A means to support network communication using radio waves rather than cables. The current Wi-Fi or wireless networking technologies are based on the IEE 802.11 standard and its numerous amendments, which address speed, frequency, authentication and encryption.

worm — A form of malware that focuses on replication and distribution. A worm is a self-contained malicious program that attempts to duplicate itself and spread to other systems. Generally, the damage caused by a worm is indirect and due to the worm's replication and distribution activities consuming all system resources. A worm can be used to deposit other forms of malware on each system it encounters.

zombie — A term related to the malicious concept of a botnet. The term zombie can be used to refer to the system that is host to the malware agent of the botnet or to the malware agent itself. If the former, the zombie is the system that is blinding performing tasks based on instructions from an

external and remote hacker. If the latter, the zombie is the tool that is performing malicious actions such as DoS flooding, SPAM transmission, eavesdropping on VoIP calls or falsifying DNS resolutions as one member of a botnet.

Appendix B – NIST Detailed Framework

This section is a detailed explanation of the framework, its functions and associated activities.

1. Identify

This section deals with the defining and developing the organization understanding that is required to manage cybersecurity. The categories in this section we will be addressing are:

Category	Description
Business Operating Environment	Understanding the operating environment for every department and they can impact or be impacted by cybersecurity.
Asset Management	Understanding the assets, we are trying to protect as part of this plan.
Governance	Identifying the various roles and responsibilities from council and management to full-time and part-time employees. It also includes the various committees and their mandates.
Risk Management	This includes having an overall strategy to manage risk as well as identifying all cybersecurity risks and potential mitigations.

2. Protect

Probably the function requiring the most attention. It includes all the activities conducted to provide safeguards in protecting our assets. They include

Category	Description
Policies, Processes and Procedure	These are the complete set of policies and processes that guide us in managing cybersecurity. They include: • Acceptable IT use Policy • Mobile Policy • Patch Management Policy • Training & Awareness Policy • Onboarding/Offboarding policies • Various IT System Policies It also includes processes and procedures for tracking issues and reporting incidents.

Training and Awareness	The most important and often overlooked activity. It includes mandatory training for all employees as well as awareness activities and resources for all employees and citizens.
Access Controls	This includes management of access of all City assets from buildings to specific systems and data/information.
Information Protection	This includes all activities to ensure the City's information is properly protected including privacy issues.
Protective Technology	This includes the infrastructure, systems, services and applications used to safeguard our networks, equipment, applications and people
Maintenance & Operations	Includes all the maintenance work required to keep systems and equipment up to date including patching, updates and upgrades.

2. Detect

This function deals with developing the activities required for detecting potential cyber events.

Category	Description
System Monitoring	This deals with the activities required to ensure systems are being monitored appropriately.
Detecting Events	This activity is tied with monitoring and deals with the timely detection of anomalies and potential events
Detection Processes	Deals with what is done when certain events are detected.

Respond

This function deals with the activities that are performed in the event a cyber event has occurred.

Category	Description
Response Planning	Deals with documenting the steps to be taken in the event of a cyber incident.
Communications	Deals with the communications that are required during an event including stakeholders and speaking points. Usually documented in the Response Plan
Analysis	Deals with the work involved in analyzing the problem as well as temporary and longer-term solutions to return to normal operations.

Mitigations	These are the fore mentioned temporary solutions put in place to minimize the impact of the event on staff. Not always required

Recover

This function deals with the steps taken after an incident.

Category	Description
Recovery Planning	Deals with documenting the steps to be taken in the event of a cyber incident. Often coupled with Response planning
Communications	Deals with the communications that are required during an event including stakeholders and speaking points. Usually documented in the Response/Recovery Plan
Post-Mortem Review	This is a complete review of the incidents and recommendations for the future
Incident Reporting	This is the complete report of the incident, including the post-mortem.

Current and target Maturity

To properly align to any framework and/or maximize our investments while minimizing our risks, it is important to look at how we manage cyber risks today vs. how we would like to do tomorrow. The framework identifies these as Tiers and profiles. Although they are not a maturity scale in the strictest definition, they do provide an industry standard approach to measure our capacity to measure cyber risks and practices. We will perform multiple activities to understand where we are and where we want to be. These are identified in the Detailed Plan.

REPORT N° INF2019-006

Date	16/09/2019
Submitted by	Click here to enter text.
Subject	Morris Village, Phase 5 Capital Cost Recovery Strategy
File N°	n/a

1) NATURE/GOAL:

The purpose of this report is to secure Council's approval of the principles of a cost recovery strategy for the construction of infrastructure for Morris Village, Phase 5.

2) DIRECTIVE/PREVIOUS POLICY:

n/a

3) DEPARTMENT'S RECOMMENDATION:

Whereas, growth related infrastructure must be constructed to support the Morris Village, Phase 5 development;

And Whereas, this infrastructure also provides service capacity for future Brigil Development adjacent to Poupart Road and External Lands west of Caron Street;

And Whereas, landowners that benefit from the servicing works constructed for Morris Village, Phase 5 will be required to pay their share of the infrastructure costs;

BE IT RESOLVED THAT Council hereby approves Option 3 as described in report No. INF2019-006, entitled "No City Front-End Financing" which consists of:

- ensuring that once development proceeds for Brigil and external lands, the developers will be requested to pay their share of benefitting servicing costs and applicable interest charges as a condition of subdivision approval; and

- Spacebuilders enters into front-end financing agreement with the City as condition of subdivision approval.

Attendu Qu'afin d'appuyer le développement de la phase 5 du Village Morris des infrastructures liées à la croissance doivent être construites ; et

Attendu que ces infrastructures desserviront les développements futurs de Brigil adjacents au chemin Poupart et les terrains externes à l'ouest de la rue Caron ; et

Attendu que les propriétaires qui bénéficieront de ces services construits pour la phase 5 du Village Morris vont devoir payer leur part des coûts des infrastructures ;

Qu'il soit résolu que le conseil municipal approuve l'option 3 « No City Front-End Financing » décrite dans le rapport no. INF2019-006 qui consiste à :

- S'assurer que les développeurs seront obligés de payer leur part des coûts des services ainsi que les intérêts applicables comme condition d'approbation d'une subdivision une fois que le développement débute par Brigil et les terrains externes ;

- Spacebuilders conclut une entente de financement préalable avec la Cité comme condition d'approbation d'une subdivision.

4) BACKGROUND:

Spacebuilders has communicated to City staff their intention to proceed with servicing works for Morris Village, Phase 5. To date, Spacebuilders has spent over $2.5 million in infrastructure works that benefit future development areas.

Spacebuilders acknowledges its responsibility to finance local servicing costs but, are of the opinion that they should not be fully responsible for front-ending the costs of servicing works for future development areas. For this reason, the developer is requesting that the City agree to a cost recovery strategy to mitigate their financial risks. In summary, Spacebuilders is requesting that the City give favourable consideration to front-ending financing a portion of or all of external lands servicing costs.

In order to address this issue, it is important to understand:

(a) the extent of lands that benefit from the Spacebuilder infrastructure works; and

(b) the timing and cost of required infrastructure.

Benefiting Land Areas:

Attachment 1 is a graphic depiction of the various landholdings that are impacted by the Morris Village, Phase 5 servicing works.

Approximately 17 separate and distinct landholdings are identified in this plan. All of these lands will derive a benefit from servicing works in Morris Village, Phase 5 and will ultimately result in approximately 4000 units of residential development.

It is acknowledged that each developer must be responsible for the emplacement of "local servicing works" that benefit their development solely. However, every effort should be made to maximize the installation of infrastructure works that provide benefit to multiple development areas. Construction of stormwater management ponds, feeder water mains, pumping stations, etc. represent infrastructure that have substantial operational and maintenance costs that will be inherited by the City once the infrastructure has been completed and accepted. These types of facilities should be consolidated and optimized as much as possible, to not only reduce costs, but minimize future operations and maintenance costs.

The challenge with this strategy; however, leads to the question as to who should be responsible for front-ending financing the cost of future benefiting lands until development actually takes place?

***Morris Village, Phase 5 Servicing Costs**:*

In order to proceed with Morris Village, Phase 5, Spacebuilders will incur total infrastructure expenditures in excess of $51 million. This amount includes local servicing cost requirements in addition to future recovery costs from other benefiting landowners in the amount of $7.8 million.

Table 4.1 provides a "high-level" breakdown of the servicing costs for Morris Village, Phase 5 by benefiting land area. It also summarizes the maximum number of units that will be achieved with full buildout.

Table 4.1

Morris Village, Phase 5 Servicing Cost Shares			
Total Shareable Servicing Costs	**Recovery Costs**		
	Spacebuilders	**Brigil**	**External Lands**
$20.1 M [4000 units]	$13.4 M [1000 units]	$2.1 M [1200 units]	$5.7 M [1800 units]

Schedule of Servicing Works:

Based on Table 4.1, it is obvious that a considerable amount of money will have to be invested to service not only Morris Village, Phase 5 but also the infrastructure needs for future development plans external to Morris Village.

It is noted; however, that not all of the infrastructure works need be constructed in the same timeframe. Rather, servicing the Phase 5 development can be staged as housing demands dictate.

Attachment 2 illustrates the various stages of the Phase 5 development. Table 4.2 summarizes the timetable associated with the construction of infrastructure in Phases A, E and K which provide benefiting services to external land owners. Servicing of the remaining phases (i.e. Phases B, C, D, F, G, H, I, J, L) identified in Attachment 1 will be serviced and financed solely by Spacebuilders.

Table 4.2

Schedule of Servicing Works				
Phase	**Morris Village**	**Servicing Start**	**Housing Construction Start**	**Proposed Recovery Costs**
Phase "A"	148	Jan. 2019	Nov. 2019	$1.1 M
Phase "E"	109	May 2022	Sept. 2021	$3.0M
Phase "K"	43	Jan. 2026	June 2026	$1.6M
TOTAL	300			$5.7M

Development Meetings:

To date, there have been several meetings with Spacebuilders and Brigil to discuss infrastructure requirements and costs; the timing of the works and particularly, a mechanism for cost recovery of infrastructure works. Spacebuilders has expressed an interest in proceeding expeditiously with servicing of Morris Village Phase 5. Similarly, Brigil has indicated that it will be proceeding with development of their lands in the foreseeable future. However, the timing of servicing and development of the "external lands" is unknown.

5) Discussion:

Since Morris Village, Phase 5 will be the first development to proceed, it is necessary to agree on servicing cost estimates and, more particularly, recovery cost shares for lands "external" to the Phase 5 development.

Initially, consideration was given to identifying the Phase 5 cost shareable servicing works in the new Development Charge Background Servicing Study as eligible development charge projects. However, since these projects provide a direct benefit to a specific land area, it was not deemed to be equitable to include these projects into a universal development charge. It is preferable for the City to impose

collect-back agreements for benefiting lands through the subdivision approval process.

As a result of the meetings with the developers, staff has assessed several options to ensure collect-back of costs incurred by Spacebuilders for lands external to Morris Village, Phase 5. Attachment 3 (Table 5.1) identifies the options considered by staff and briefly describes the option, the mechanism for cost recovery and the pros and cons of each.

Staff Recommendation:

The department has carefully reviewed the implications of the five options summarized in Attachment 3 and supports *Option 3-No City Front-End Financing* as the preferred cost recovery mechanism for Morris Village, Phase 5 infrastructure. The reasons for this are as follows:

- The option is consistent with past practices used by the City for cost sharing infrastructure for multiple landowners.
- It does not result in a undesirable impact on the City's debt financing limits.
- It does not create an onerous precedent that would be advanced for future developments in the municipality.
- The City has minimal involvement in the construction of infrastructure. It becomes an improving agency only.
- The timing of construction rests solely with the developers/builders.
- Private sector infrastructure emplacement can result in reduced costs.

6) CONSULTATION:

Consultation has occurred with representatives from the City, Spacebuilders, and Brigil with regards to the servicing needs and associated cost recovery strategies.

It is anticipated that further consultation will continue into the subdivision approval process.

Staff will also convene a meeting prior to year-end with the "external" landowners to ensure that they are aware of (a) servicing requirements and (b) the requirement to pay their fair share of servicing costs constructed by Spacebuilders.

7) RECOMMENDATIONS OR COMMENTS FROM COMMITTEE/ OTHER DEPARTMENTS:

n/a

8) FINANCIAL IMPACT (expenses/material/etc.):

Subject to approval of Option 3, the City would not be subject to any substantial financial impacts. The risk associated with collect- back of infrastructure costs would rest solely with the developer.

9) LEGAL IMPLICATIONS:

Utilization of cost recovery agreements is an accepted development strategy and is legally permissible.

10) RISK MANAGEMENT:

Option 3 represents the least financial risk to the City since the developer will be responsible for the construction of cost sharing infrastructure. Cost recovery agreements would be required from future benefiting landowners as a condition of subdivision approval. The timing of development; however, is unknown at this time.

11) STRATEGIC IMPLICATIONS :

Adoption of the Administration's recommendation detailed in this report is consistent with the strategic directions contained in the Financial Stability and Environmental Responsibility objectives of Council’s approved Strategic Plan.

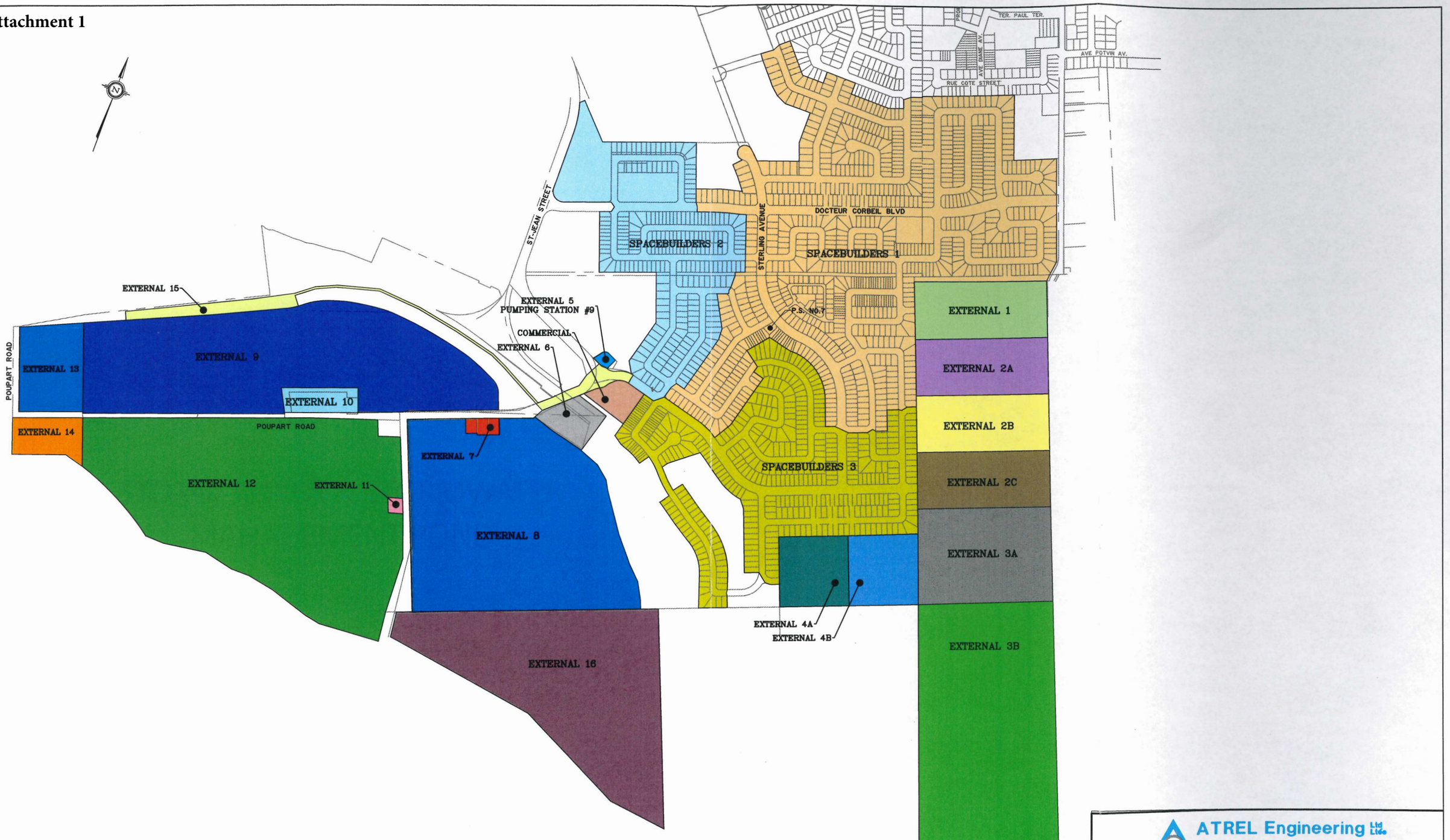
12) SUPPORTING DOCUMENTS:

Attachment 1: Morris Village Benefiting Service Areas

Attachment 2: Morris Village Phasing Map

Attachment 3: Summary of Cost Recovery Options

Attachment 1



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MORRIS VILLAGE COST SHARING

SCALE: 1:10000

COST SHARING BENEFITERS

JUNE 2019 | FIGURE 1

Attachment 2

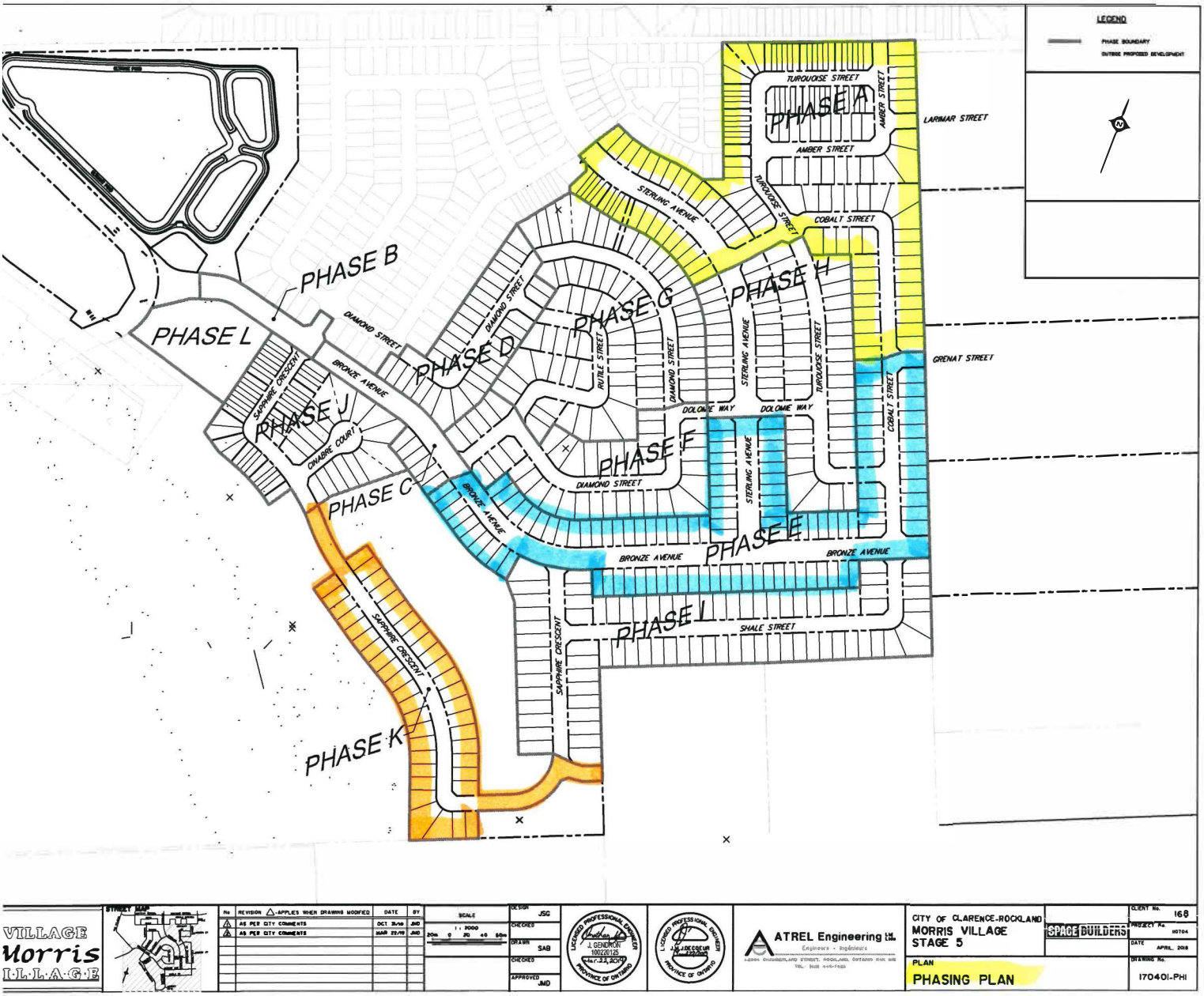


Table 5.1 - Summary of Servicing Cost Recovery Options

Option #	Description	Cost Recovery Mechanism	Pros	Cons
1 - Development Charge Projects - City Controlled	Projects included in DC Background Study	The City recovers costs from payment of area specific DC charges at issuance of building permits	Developers do not have to front-end finance of future servicing works (developer perspective)	The City controls implementation of construction works
	The City is responsible for financing, tendering, construction, etc., of capital works	Project costs indexed annually until development occurs		More cumbersome administratively because of area specific charges
				The City would have to debt finance capital costs
				Costs usually higher when the City tenders capital programs
				The City is subject to more regulations/policies than private sector
				Recovery of external servicing costs dependant on timing of development. May be long timeframes.
2 - Development Charge Projects	Projects identified in DC Background Study	Developer (i.e. Spacebuilders) required to enter into DC crediting agreement with the City for their share of servicing costs	Developer has control over implementation of infrastructure	Compounding index charges for capital works may become exorbitant
	First developer to proceed (e.g. Spacebuilders) must front-end finance and emplace servicing works	For external land servicing costs, as condition of subdivision approvals, the City would request developers/builders to pay their share of benefitting servicing costs as soon as development proceeds	Minimal City involvement	
	Benefitting area recovery cost indexed annually in keeping with annual construction costs	Service works will be indexed annually	Developers assume risk for collect back of servicing costs (City perspective)	
			The City does not have any financial responsibility	
			Potential lower construction costs	
			Developer not subject to same rules, regulation and policies as the City	
3 - Cost Recovery Agreements - No City Front-End Financing	Projects not included in DC Background Study.	Once development proceeds for Brigil and external lands, they will be requested to pay their share of benefitting servicing costs and applicable interest charges as a condition of subdivision approval	The City's role for emplacement of infrastructure is minimal	Developers assumes financial collect back risks

Table 5.1 - Summary of Servicing Cost Recovery Options

Option #	Description	Cost Recovery Mechanism	Pros	Cons
	Developer front-end finances and emplaces servicing works	Spacebuilders enters into front-end financing agreement with the City as condition of subdivision approval	Administratively less cumbersome for the City	
		Front-ending agreement indicates that "City will endeavour to the best of its legal ability" to impose collect back agreements for developments	Developers front-end finance all future servicing works	
			Developers control construction timing	
			Procedures consistent with past practices	
4 - Cost Recovery Agreements - City Front-Ends External Land Servicing Costs	Projects not included in DC Background Study	City will front-end 100% of external land servicing costs	The City's involvement in infrastructure placement is minimal	The City assumes financial risk since timing is unknown for external land servicing
	Spacebuilders subdivision agreements will contain a clause "that to the best of its legal ability" the City will require Brigil to pay their share of servicing costs at time of subdivision approval	As external lands development proceeds, landowners will be required (as condition of subdivision approval) to pay their share of servicing costs plus indexation	Less cumbersome process since no DC rules/regulations	Impacts the City debt financial limits ($5.6 million)
	Spacebuilders will front-end finance Brigil's shared servicing costs	Brigil's shared contribution costs will be directed to Spacebuilders	City demonstrates "partnership" philosophy with development community	Establishes precedent for other developments
				Not consistent with past practices re: front-ending emplacement of infrastructure for other benefitting lands
5 - Cost Recovery Agreements - Shared Financial Risk	Same as Option #4, except both the City and the developer share equally in financial risks re: collect back for external lands	As external land development proceeds, the City imposes collect-back agreements for advanced servicing costs	Same as Option #4	Same as Option #4 except the City's financial risk is reduced to $2.8 million
	Brigil's servicing costs front-ended by Spacebuilders	50% of collect back monies go to the City and 50% to Spacebuilders		
		Brigil reimburses Spacebuilders the servicing costs plus interest as soon as their development proceeds		

REPORT N° INF2019-007

Date	16/09/2019
Submitted by	Dave Darch
Subject	Development Charge (DC) Update
File N°	Click here to enter text.

1) NATURE/GOAL :

The purpose of this report is to provide members of Council with an update on the 2020 Development Charge Study.

2) DIRECTIVE/PREVIOUS POLICY :

On June 17, 2019 staff gave a slide presentation to members of Council with respect to several issues relating to the current Development Charges study update. At the conclusion of the meeting, copies of the draft capital works program and associated residential and non-residential development charge rates were distributed to Council members.

At that time, staff confirmed that the draft capital program and development charge rates would be submitted to development stakeholders for review and comment.

3) DEPARTMENT'S RECOMMENDATION :

Whereas, the City has initiated and completed Master Servicing Studies to determine capital needs based on forecasted growth projections within the municipality;

And Whereas, it is the City's intention to publish the draft Development Charge Background Study on the City's website on September 18, 2019;

And Whereas, the City must have an approved Development Charge By-Law update by no later than February 5, 2020;

And Whereas, staff has consulted with the development community with respect to the draft capital works program and associated residential/non-residential development charges;

Be It Resolved That Council receive Report INF2019-007, as information.

4) BACKGROUND :

At the June 17 Council meeting, staff provided members of Council with a detailed overview of the 2020 Development Charge Study update that is currently underway by the City. Since development charge by-laws are required to be updated at a minimum every five years, it is important to note that Council must approve an updated by-law by no later than February 5, 2020.

The determination of growth related infrastructure requirements has a direct correlation with projected growth forecasts that are approved by Council. Council approved the projected growth rates for 2019-2044 on August 21, 2017. Subsequently, Master Servicing Studies were initiated and completed to determine growth related needs, costs and timing of construction for transportation, sewer and water servicing works. The findings of these studies, in turn, provided the necessary information to calculate draft residential and non-residential development charge rates for the 2019-2028 time period.

5) Discussion:

An important aspect of the development charge update process is ensuring that the appropriate stakeholders are fully aware of the progress of the study update and, particularly, have an opportunity to provide input into the draft capital works and associated development charges.

Development Community Consultations

Consultation with affected development stakeholders is a critical component of the development charge update process in order to ensure that they are kept current on the progress of the update studies and, in particular, are given an opportunity to provide input into the draft capital programs and associated development charges.

The details of the consultation process are summarized as follows:

1.0 Local Servicing Standards:

Currently, the City does not have any service level standards that clearly delineate the financial roles and responsibilities of the developer/builder and the City.

In the Spring of this year, staff developed a set of Local Service Guidelines based on a review of industry best practices. The objective of the guidelines is to provide assistance to the development community, as well as City staff, to ensure that there is a clear

understanding as to which types of infrastructure are eligible for DC funding and those which are the responsibility of the developer/builder.

Upon finalization of the draft local service standards, staff circulated the guidelines to the development community for review and comment. The developers designated a staff member from EQ Homes to act as the development community's representative who in turn retained the services of a consultant to review the local service guidelines.

Formal comments were received on April 2, 2019. The following summarizes some of the more relevant observations:

- "…. the City's existing local service guidelines are contained within the DC by-law and are not sufficiently detailed…". It goes on to state that "the new guidelines provide much more clarity to the city's approach".

- compared to several existing subdivision agreements, "the City's draft local service guidelines are much more liberal in allowing some of the identified works to be eligible for DC funding"

- the development community's response requested further consideration re: DC eligibility for sidewalks connecting developments to public spaces, mixed-use trails, storm water drainage works that "benefit users beyond those just within the subject development"

- there was a request that the City should prepare a schedule or map showing the classification of the existing road network

- there was a request to review the old local service guidelines to determine if previously ineligible servicing costs would now be eligible under the new guidelines.

Staff has reviewed the comments received from the development community and has made adjustments as deemed appropriate. The revised Local Servicing Standards will be an annex to the new DC Background Study .

2.0 Development Related Capital Programs

On July 19, 2019, staff sent out a communiqué to the development community requesting that it provide feedback on the draft development related capital programs and the calculated development charges by August 23, 2019.

The City received approximately five written responses. For purposes of clarity, there was a request from several firms to provide maps showing the proposed capital programs by service category. As well, one firm, representing the River Lands of Rockland Inc./Clarence Crossing Subdivision, requested the inclusion of additional servicing projects for roadworks, water and sanitary sewers in support of the proposed development.

It is interesting to note that there were no comments received with respect to the quantum of the development charge rates nor reducing any of the projects contained in the capital works project summary.

Staff reviewed the requests and has made adjustments that are consistent with the Local Servicing Standards referenced above.

Attachment 1 provides the amended capital works program to support growth for the 2019-2028 period. The draft development charge rates for both residential and non-residential developments are shown in Attachment 2.

Attachment 3 provides a DC comparison chart with respect to development charge rates in other municipalities.

Development Charge By-law Update Timelines:

Attachment 4 summarizes the key milestone dates associated with the passage of an updated Development Charge By-law. This attachment highlights specific dates of each event and relevant comments.

As mentioned earlier in this report, Council approval of an updated Development Charge By-Law must be obtained by no later than February 5, 2020. Attachment 4 provides a timeline that contemplates passage of a new by-law by the November 18, 2019. The December 2, 2019 date represents a secondary date (if necessary) to pass the new Development Charge by-law.

Following Council's consideration of this report, the Development Charge Background Study will be published on the City's website. This must be done 60 days before the anticipated by-law passage on November 18, 2019. The mandatory public meeting will be advertised in a newspaper of general circulation on October 1, 2019 and the actual public meeting will take place on October 21, 2019.

6) CONSULTATION:

As detailed in the Discussion section of this report, extensive consultation with the City's development stakeholders has taken place in relation to servicing standards, growth related capital programs and the draft DC rates.

7) RECOMMENDATIONS OR COMMENTS FROM COMMITTEE/ OTHER DEPARTMENTS :

N/A

8) FINANCIAL IMPACT (expenses/material/etc.) :

Approval of a new Development Charge By-law will identify growth related capital infrastructure requirements and the respective financial responsibilities of the development stakeholders and the City of Clarence-Rockland. The City must ensure that annual budget approvals are secured for the City's portion of approved development charge capital works.

9) LEGAL IMPLICATIONS :

There is a provincial requirement for every municipality to update its Development Charge By-law at a minimum of once every five years. The City's current Development Charge By-Law was formally approved by Council on February 5, 2015. Therefore, a new development charge by-law must be approved by no later than February 5, 2020.

10) RISK MANAGEMENT:

The Development Charge Background Study is a critical document in terms of identifying infrastructure needs to support projected capital growth requirements. The development charge program will enable the municipality to assess and implement operational needs in support of growth related infrastructure once assumed by the municipality.

11) STRATEGIC IMPLICATIONS:

The Development Charge Update Process supports the Growth Management Strategic Priority identified in the Environmental pillar of Council's approved Strategic Plan.

12) SUPPORTING DOCUMENTS:

Attachment 1: Draft 10-Year Development Charge Capital Program

Attachment 2: Draft Residential and Non-residential Development Charge Rates

Attachment 3: DC Comparison Chart with other Municipalities

Attachment 4: Development Charge Milestones

CITY OF CLARENCE-ROCKLAND
DEVELOPMENT-RELATED CAPITAL PROGRAM
FIRE SERVICES

Project Description	Timing	Gross Project Cost	Grants/ Subsidies/Other Recoveries	Net Municipal Cost	Ineligible Costs		Total DC Eligible Costs	DC Eligible Costs		
					BTE (%)	Replacement & BTE Shares		Available DC Reserves	2019-2028	Post 2028
1.0 FIRE SERVICES										
1.1 Recovery of Negative Reserve Fund	2019	$ 813,888	$ -	$ 813,888	0%	$ -	$ 813,888	$ -	$ 813,888	$ -
1.2 Buildings, Land & Furnishings										
1.2.1 Rockland Expansion - Construction	2019	$ 2,753,040	$ -	$ 2,753,040	26%	$ 715,790	$ 2,037,250	$ -	$ 500,000	$ 1,537,250
1.2.2 Bourget Replacement - Construction	2019	$ 1,978,429	$ -	$ 1,978,429	26%	$ 514,392	$ 1,464,037	$ -	$ 266,203	$ 1,197,835
1.2.3 Bourget Training Centre	2020	$ 1,500,000	$ -	$ 1,500,000	50%	$ 750,000	$ 750,000	$ -	$ -	$ 750,000
1.2.4 New Station 4 - Land Acquisition	2028	$ 400,000	$ -	$ 400,000	0%	$ -	$ 400,000	$ -	$ -	$ 400,000
1.2.5 New Station 4 - Design	2028	$ 200,000	$ -	$ 200,000	0%	$ -	$ 200,000	$ -	$ -	$ 200,000
1.2.6 New Station 4 - Construction	2028	$ 3,000,000	$ -	$ 3,000,000	0%	$ -	$ 3,000,000	$ -	$ -	$ 3,000,000
Subtotal Buildings, Land & Furnishings		$ 9,831,469	$ -	$ 9,831,469		$ 1,980,182	$ 7,851,287	$ -	$ 766,203	$ 7,085,084
1.3 Vehicles										
1.3.1 Command Vehicle	2019	$ 65,000	$ -	$ 65,000	0%	$ -	$ 65,000	$ -	$ -	$ 65,000
1.3.2 Rehab & Decontamination Unit	2021	$ 450,000	$ -	$ 450,000	0%	$ -	$ 450,000	$ -	$ -	$ 450,000
1.3.3 Additional Tanker - Station 4	2026	$ 280,000	$ -	$ 280,000	0%	$ -	$ 280,000	$ -	$ -	$ 280,000
1.3.4 Additional Pumper - Station 4	2028	$ 600,000	$ -	$ 600,000	0%	$ -	$ 600,000	$ -	$ -	$ 600,000
Subtotal Vehicles		$ 1,395,000	$ -	$ 1,395,000		$ -	$ 1,395,000	$ -	$ -	$ 1,395,000
1.4 Equipment & Studies										
1.4.1 SCBA - Station 4	2028	$ 100,000	$ -	$ 100,000	0%	$ -	$ 100,000	$ -	$ -	$ 100,000
1.4.2 Extrication Tools - Station 4	2028	$ 50,000	$ -	$ 50,000	0%	$ -	$ 50,000	$ -	$ -	$ 50,000
1.4.3 Compressor & Fill Station - Station 4	2028	$ 55,000	$ -	$ 55,000	0%	$ -	$ 55,000	$ -	$ -	$ 55,000
1.4.4 Fire Master Plan	2027	$ 125,000	$ -	$ 125,000	0%	$ -	$ 125,000	$ -	$ -	$ 125,000
Subtotal Equipment & Studies		$ 330,000	$ -	$ 330,000		$ -	$ 330,000	$ -	$ -	$ 330,000
TOTAL FIRE SERVICES		**$ 12,370,357**	**$ -**	**$ 12,370,357**		**$ 1,980,182**	**$ 10,390,175**	**$ -**	**$ 1,580,091**	**$ 8,810,084**

Residential Development Charge Calculation		
Residential Share of 2019 - 2028 DC Eligible Costs	88%	$1,390,480
10-Year Growth in Population in New Units		4,507
Unadjusted Development Charge Per Capita		**$308.52**
Non-Residential Development Charge Calculation		
Non-Residential Share of 2019 - 2028 DC Eligible Costs	12%	$189,611
10-Year Growth in Square Metres		30,500
Unadjusted Development Charge Per Square Metre		**$6.22**

2019 - 2028 Net Funding Envelope	$1,580,091
Reserve Fund Balance	
Balance as at December 31, 2018	($813,888)

CITY OF CLARENCE-ROCKLAND
DEVELOPMENT-RELATED CAPITAL PROGRAM
PUBLIC WORKS

Project Description	Timing	Gross Project Cost	Grants/ Subsidies/Other Recoveries	Net Municipal Cost	Ineligible Costs		Total DC Eligible Costs	DC Eligible Costs		
					BTE (%)	Replacement & BTE Shares		Available DC Reserves	2019-2028	Post 2028
5.0 PUBLIC WORKS										
5.1 Buildings										
5.1.1 Snow Dump (including Land) - Rockland	2019	$ 1,459,835	$ -	$ 1,459,835	50%	$ 729,918	$ 729,918	$ 137,317	$ 592,601	$ -
5.1.2 Snow Dump (including Land) - Bourget	2020	$ 600,000	$ -	$ 600,000	50%	$ 300,000	$ 300,000	$ -	$ 300,000	$ -
5.1.3 Garage Renovation and Expansion	2021	$ 1,300,000	$ -	$ 1,300,000	50%	$ 650,000	$ 650,000	$ -	$ 256,309	$ 393,691
Subtotal Buildings		$ 3,359,835	$ -	$ 3,359,835		$ 1,679,918	$ 1,679,918	$ 137,317	$ 1,148,910	$ 393,691
5.2 Fleet & Equipment										
5.2.1 Compactor	2019	$ 20,000	$ -	$ 20,000	0%	$ -	$ 20,000	$ 20,000	$ -	$ -
5.2.2 Line Painting Machine	2019	$ 36,000	$ -	$ 36,000	50%	$ 18,000	$ 18,000	$ 18,000	$ -	$ -
5.2.3 Sidewalk Machine	2021	$ 150,000	$ -	$ 150,000	0%	$ -	$ 150,000	$ -	$ 150,000	$ -
5.2.4 Tandem	2023	$ 350,000	$ -	$ 350,000	0%	$ -	$ 350,000	$ -	$ -	$ 350,000
5.2.5 Maintenance Equipment	Various	$ 225,000	$ -	$ 225,000	0%	$ -	$ 225,000	$ -	$ 112,500	$ 112,500
5.2.6 Support Vehicles	Various	$ 290,000	$ -	$ 290,000	0%	$ -	$ 290,000	$ -	$ 145,000	$ 145,000
Subtotal Fleet & Equipment		$ 1,071,000	$ -	$ 1,071,000		$ 18,000	$ 1,053,000	$ 38,000	$ 407,500	$ 607,500
TOTAL PUBLIC WORKS		**$ 4,430,835**	**$ -**	**$ 4,430,835**		**$ 1,697,918**	**$ 2,732,918**	**$ 175,317**	**$ 1,556,410**	**$ 1,001,191**

Residential Development Charge Calculation		
Residential Share of 2019 - 2028 DC Eligible Costs	88%	$1,369,641
10-Year Growth in Population in New Units		4,507
Unadjusted Development Charge Per Capita		**$303.89**
Non-Residential Development Charge Calculation		
Non-Residential Share of 2019 - 2028 DC Eligible Costs	12%	$186,769
10-Year Growth in Square Metres		30,500
Unadjusted Development Charge Per Square Metre		**$6.12**

2019 - 2028 Net Funding Envelope	$1,556,410
Reserve Fund Balance	
Balance as at December 31, 2018	$175,317

CITY OF CLARENCE-ROCKLAND
DEVELOPMENT-RELATED CAPITAL PROGRAM
ROADS AND RELATED

NO.	Infrastructure Requirement	Description / Remarks	Limits	Term	Timing		Estimated Project Costs				
					From	To	Gross Cost	Benefit to Existing Share	Other Contributions	Post Period Allocation[1]	Net Growth-Related
City-Wide Roads Projects											
Cycling											
1	Caron Street	Buffered Paved shoulder with signage on both sides of the roadway.	Between the David Street in the north and Baseline Road in the south.	Mid-Term	2024	2028	$583,000	$291,500	$0	$0	$291,500
2	Laurier Street	Buffered bike lane with flex bollards with signage and cycling lane markings both directions.	Between Richelieu Street in the west, and Heritage Drive in the east	Short-Term	2019	2023	$616,000	$308,000	$0	$0	$308,000
3	Laurier Street	Painted bike lane with signage and cycling lane markings both directions.	Between Heritage Drive in the west and County Road 17 in the east	Short-Term	2019	2023	$408,000	$204,000	$0	$0	$204,000
4	Sterling Avenue Extension	Painted bike lane with signage and cycling lane markings both directions.	Between Platinum Drive in the north and Poupart Road Extension in the south.	Short-Term	2019	2023	$347,000	$0	$0	$0	$347,000
Multi-Use Path											
5	New Roadway	Multi-Use pathway built on the north side of the roadway as part of the construction of the New east-west roadway to service a new subdivision in south Rockland.	Between Caron Street in the east and St. Jean Street in the west.	Short-Term	2019	2023	$612,000	$0	$0	$0	$612,000
6	Poupart Road	New multi-use path on the north side of Poupart Road built as part of the Poupart Road widening.	Between RIchelieu Street in the north and St. Jean Street in the east.	Short-Term	2019	2023	$744,000	$0	$0	$0	$744,000
7	St. Jean Street	New multi-use path on the east side of St. Jean Street built as part of development.	Between Docteur Corbeil Boulevard in the north and Poupart Road in the south on the east side of the roadway.	Short-Term	2019	2023	$262,000	$0	$0	$0	$262,000
8	Bridewater Pedestrian Bridge				2019	2019	$1,500,000	$0	$0	$858,267	$641,733
9	Clarence Crossing Multi Use Path				2021	2026	$600,000	$150,000	$0	$0	$450,000

CITY OF CLARENCE-ROCKLAND
DEVELOPMENT-RELATED CAPITAL PROGRAM
ROADS AND RELATED

NO.	Infrastructure Requirement	Description / Remarks	Limits	Term	Timing From	Timing To	Estimated Project Costs: Gross Cost	Benefit to Existing Share	Other Contributions	Post Period Allocation[1]	Net Growth-Related
City-Wide Roads Projects											
Roadway											
10	Green Avenue	Extension of Green Avenue to Caron Street.	Between existing extent of Green Avenue in the east to connect with the Docteru Corbeil Boulevard / Caron Street intersection in the west.	Mid-Term	2024	2028	$942,000	$0	$0	$538,992	$403,008
11	Poupart Road & St. Jean Street	Road widening from two lanes to four. Will include a multi-use pathway on the north side of the roadway.	Between Laurier Street in the north and St. Jean Street in the east.	Short-Term	2019	2023	$9,900,000	$0	$0	$5,664,565	$4,235,435
12	New Roadway	New Roadway Construction. Will include will include a multi-use pathway on the north side of the roadway and a pedestrian sidewalk on the south side.	Between Caron Street in the east and St. Jean Street in the west.	Short-Term	2019	2023	$5,293,000	$0	$0	$3,028,540	$2,264,460
13	Sterling Avenue Extension	Extension of Sterling Avenue with painted bike lanes and sidewalks on boths sides of the road.	Between Platinum Drive in the north and Poupart Road Extension in the south.	Short-Term	2019	2023	$1,884,000	$0	$0	$1,077,984	$806,016
14	Est Rockland East (Laurier - County Rd. 17)			Short-Term	2019	2023	$120,000	$0	$0	$68,661	$51,339
Pedestrian (Sidewalk)											
15	Poupart Road	Sidewalk on one side of the street.	Between St Jean Street In The East To Richelieu Street In The West	Mid-Term	2024	2028	$530,000	$0	$0	$0	$530,000
16	Laurier Street	Add sidewalk on the other side of the street so that both sides of the road have a sidewalk.	Between Clarence Rockland Veterinary Hospital On The East To Poupart Road In The West	Short-Term	2019	2023	$112,000	$56,000	$0	$0	$56,000
17	Sterling Avenue	Add sidewalk on the other side of the street so that both sides of the road have a sidewalk.	Between Silver Lane In The North To Docteur Corbeil Boulevard In The South	Short-Term	2019	2023	$144,000	$72,000	$0	$0	$72,000
18	New Roadway	Sidewalk on one side of the street.	Between St. Jean Street in the West and Caron Street in the East on the south side of the roadway.	Short-Term	2019	2023	$525,000	$0	$0	$0	$525,000
19	Sterling Avenue Extension	Sidewalk on both sides of the street.	Between Platinum Drive In The North And Poupart Road Extension In The South.	Short-Term	2019	2023	$417,000	$0	$0	$0	$417,000
Intersection											
20	Poupart Road	Planned Roundabout	At St. Jean Street and Docteur Corbeil Boulevard.	Mid-Term	2024	2028	$1,150,000	$0	$0	$658,005	$491,995
21	Poupart Road	Planned Roundabout	At the intersection of Poupart Road and St. Jean Street.	Short-Term	2019	2023	$1,150,000	$0	$0	$658,005	$491,995
22	Poupart Road	Planned Roundabout	At the future intersection of St. Jean and the new east-west roadway servicing the new subdivision.	Short-Term	2019	2023	$1,150,000	$0	$0	$658,005	$491,995
23	Carmen Bergeron Street	Upgrade existing stop-controlled intersection to a Signalized Intersection.	At Carmen Bergeron Street and Richelieu Street.	Short-Term	2019	2023	$345,000	$0	$0	$197,402	$147,598
24	Richelieue Street	Upgrade existing stop-controlled intersection to a Signalized Intersection.	At Richelieu Street and Poupart Road.	Short-Term	2019	2023	$345,000	$0	$0	$197,402	$147,598
25	Traffic Light	De la Berge street /Laurier/chemin de comté			2021	2021	$450,000	$225,000	$0	$128,740	$96,260
Studies											
26	Servicing Study Update				2023	2023	$150,000	$30,000	$0	$0	$120,000
27	Master Transportation Study				2027	2028	$200,000	$40,000	$0	$0	$160,000
28	Provison for other Development-Related Studies				2019	2028	$150,000	$0	$0	$0	$150,000
Total Roads Projects: 2019-2028							**$30,629,000**	**$1,376,500**	**$0**	**$13,734,568**	**$15,517,932**

Notes
1) The post period allocation are based on share of household growth to 2041. The post-period share is: **57%**
2) Available DC Reserve Funds have been accounted for through the cash flow analysis

CITY OF CLARENCE-ROCKLAND
SUMMARY OF UNADJUSTED RESIDENTIAL AND NON-RESIDENTIAL DEVELOPMENT CHARGES
ROADS AND RELATED 2019-2028

10-Year Growth in Population in New Units	4,507
Employment Growth	610
10-Year Growth in Square Meters	30,500

	Development-Related Capital Forecast						Residential Share		Non-Residential Share	
	Gross Project Cost ($000)	Benefit to Existing Share ($000)	Other Contributions ($000)	Available DC Reserves ($000)	Post Period Allocation ($000)	Total Net Capital Costs After Discount ($000)	%	$000	%	$000
ROADS AND RELATED 2019-2028										
City-Wide Roads Projects	$30,629.00	$1,376.50	$0.00	$1,380.01	$13,734.57	$14,137.92	88%	$12,441.37	12%	$1,696.55
TOTAL ROADS AND RELATED 2019-2028	**$30,629.00**	**$1,376.50**	**$0.00**	**$1,380.01**	**$13,734.57**	**$14,137.92**		**$12,441.37**		**$1,696.55**
Unadjusted Development Charge Per Capita ($)								**$2,760.46**		
Unadjusted Development Charge Per Sq. M. ($)										**$55.62**

CITY OF CLARENCE-ROCKLAND
DEVELOPMENT-RELATED CAPITAL PROGRAM
WATERWORKS

NO.	Infrastructure Requirement	Timing From - To	Estimated Project Costs				
			Gross Cost	Benefit to Existing Share	Direct Developer Contribution	Post Period Allocation	Net Growth-Related
City-wide Water Projects							
1	Rockland WTP Capacity Expansion	2026 - 2026	$10,172,000	$0	$0	$7,137,501	$3,034,499
2	Replace Transmission Main - Pressure Zone 1 - WTP Discharge	2026 - 2026	$514,000	$169,620	$0	$241,645	$102,735
3	Mtée Poupart (St-Jean - End) Asphalt Wal-Mart	2019 - 2019	$125,000	$0	$0	$0	$125,000
4	St-Jean (Patricia-Jérome Corbeil loop)	2019 - 2019	$43,000	$0	$0	$0	$43,000
5	Est-Ouest/East-West Corridor (Caron - St-Jean)	2020 - 2020	$150,000	$0	$0	$0	$150,000
6	Est-Ouest/East-West Corridor (Caron - 400m East)	2022 - 2022	$30,000	$0	$0	$0	$30,000
7	Rockland East (Laurier - County Road 17)	2019 - 2019	$30,000	$0	$0	$0	$30,000
Studies							
8	Water Treatment Plant Capacity Study	2019 - 2019	$500,000	$0	$0	$0	$500,000
9	Provison for other Development-Related Studies	2019 - 2028	$150,000	$0	$0	$0	$150,000
Subtotal City-wide Water Projects			**$11,714,000**	**$169,620**	**$0**	**$7,379,146**	**$4,165,234**
Pressure Zone-Specific Water Projects							
Pressure Zone 1 (Rockland) - Water Projects							
10	Honeywell Sub (Water Plant to 17) Oversizing	2023 - 2028	$60,000	$0	$0	$0	$60,000
11	New Watermain - Pressure Zone 1 - St. Jean St.	2019 - 2019	$50,000	$0	$0	$0	$50,000
Pressure Zone 2 (Villages) - Water Projects							
12	Caron Booster Station Capacity Expansion	2025 - 2025	$ 1,177,000	$0	$0	$916,135	$260,865
13	New Transmission Mains - Pressure Zones 1 and 2 - Caron Booster Station	2019 - 2019	$ 3,841,000	$1,267,530	$0	$2,003,097	$570,373
Subtotal Pressure Zone-Specific Water Projects			**$5,128,000**	**$1,267,530**	**$0**	**$2,919,231**	**$941,239**
Total Water Projects			**$16,842,000**	**$1,437,150**	**$0**	**$10,298,377**	**$5,106,473**

Note: Available DC Reserve Funds have been accounted for through the cash flow analysis*

CITY OF CLARENCE-ROCKLAND
SUMMARY OF UNADJUSTED RESIDENTIAL AND NON-RESIDENTIAL DEVELOPMENT CHARGES
WATERWORKS 2019-2028

10-Year Growth in Population in New Units	4,507
Employment Growth	610
10-Year Growth in Square Meters	30,500

	Development-Related Capital Forecast									
	Gross Project Cost ($000)	Benefit to Existing Share ($000)	Direct Developer Contributions ($000)	Available DC Reserves ($000)	Post Period Allocation ($000)	Total Net Capital Costs After Discount ($000)	Residential Share		Non-Residential Share	
							%	$000	%	$000
WATERWORKS 2019-2028										
City-wide Water Projects	$11,714.00	$169.62	$0.00	$448.01	$7,379.15	$3,717.22	88%	$3,271.15	12%	$446.07
Pressure Zone-Specific Water Projects	$5,128.00	$1,267.53	$0.00	$0.00	$2,919.23	$941.24	88%	$828.29	12%	$112.95
TOTAL WATERWORKS 2019-2028	**$16,842.00**	**$1,437.15**	**$0.00**	**$448.01**	**$10,298.38**	**$4,658.46**		**$4,099.45**		**$559.02**
Unadjusted Development Charge Per Capita ($)								**$909.57**		
Unadjusted Development Charge Per Sq. M. ($)										**$18.33**

Note: As many of the works are being designed to benefit growth both in this period and beyond the 10-year planning period, a share of the costs are considered to be recovered from future DCs outside this planning period

CITY OF CLARENCE-ROCKLAND
DEVELOPMENT-RELATED CAPITAL PROGRAM
SANITARY SEWAGE

NO.	Infrastructure Requirement	Timing	Estimated Project Costs					
		From - To	Gross Cost	Benefit to Existing Share		Direct Developer Contribution	Post Period Allocation	Net Growth-Related
City-wide Sanitary Sewer Projects								
1	Rockland WPCP Capacity Expansion	2023 - 2023	$9,660,000	0%	$0	$0	$4,817,237	$4,842,763
2	Rockland WPCP Headworks Upgrade	2020 - 2020	$11,233,000	34%	$3,819,220	$0	$5,681,138	$1,732,642
3	Sanitary Pump Station #1 Expansion	2024 - 2024	$2,419,000	34%	$822,460	$0	$1,399,200	$197,340
4	New Sanitary Pump Station #7 Construction	2019 - 2019	$1,100,736	0%	$0	$1,100,736	$0	$0
5	New Sanitary Sewer to Pump Station #7	2019 - 2019	$141,780	0%	$0	$141,780	$0	$0
6	New Sanitary Pump Station #9	2019 - 2019	$5,078,261	0%	$0	$5,078,261	$0	$0
7	New Sanitary Sewer to Pump Station #9	2019 - 2019	$624,525	0%	$0	$624,525	$0	$0
8	Replace Sanitary Sewers - Laurier Trunk Sewers Phases 1 and 2	2019 - 2019	$1,439,000	43%	$618,770	$0	$779,263	$40,967
9	Replace Sanitary Sewers - Laurier Trunk Sewer to Pump Station #1	2023 - 2023	$3,698,000	43%	$1,590,140	$0	$2,002,582	$105,278
10	Mtée Poupart (St-Jean - End Asphalt W-Mart)	2019 - 2019	$228,000	0%	$0	$0	$0	$228,000
11	St-Jean (Dr. Corbeil-Mtée Poupart)	2019 - 2019	$207,000	0%	$0	$0	$0	$207,000
12	Est-Ouest Corridor East-West (Caron - St-Jean)	2020 - 2020	$400,000	0%	$0	$0	$0	$400,000
13	Nord-sud/North South Collector (+-Sterling to East -West Collector)	2019 - 2019	$104,000	0%	$0	$0	$0	$104,000
14	Est-Ouest Corridor EastWest (Caron - 400m East)	2022 - 2022	$80,000	0%	$0	$0	$0	$80,000
15	Gestion Bio Solids Management	2019 - 2019	$1,578,000	40%	$631,200	$0	$340,848	$605,952
16	Laurier Phase II	2019 - 2019	$397,000	65%	$258,050	$0	$0	$138,950
17	Clarence Creek Sanitary Siphon Crossing	2021 - 2021	$350,000	0%	$0	$0	$0	$350,000
Studies								
18	Sanitary System Master Plan	2019 - 2019	$300,000	0%	$0	$0	$0	$300,000
19	Provison for other Development-Related Studies	2019 - 2028	$150,000	0%	$0	$0	$0	$150,000
Subtotal City-wide Sanitary Sewer Projects			**$39,188,302**		**$7,739,840**	**$6,945,302**	**$15,020,268**	**$9,482,892**

Note: Available DC Reserve Funds have been accounted for through the cash flow analysis*

CITY OF CLARENCE-ROCKLAND
SUMMARY OF UNADJUSTED RESIDENTIAL AND NON-RESIDENTIAL DEVELOPMENT CHARGES
SANITARY SEWAGE 2019-2028

10-Year Growth in Population in New Units	4,507
Employment Growth	610
10-Year Growth in Square Meters	30,500

	Development-Related Capital Forecast						Residential Share		Non-Residential Share	
	Gross Project Cost ($000)	Benefit to Existing Share ($000)	Direct Developer Contributions ($000)	Available DC Reserves ($000)	Post Period Allocation ($000)	Total Net Capital Costs After Discount ($000)	%	$000	%	$000
SANITARY SEWAGE 2019-2028										
City-wide Sanitary Sewer Projects	$39,188.30	$7,739.84	$6,945.30	$2,914.96	$15,020.27	$6,567.93	88%	$5,779.78	12%	$788.15
TOTAL SANITARY SEWAGE 2019-2028	**$39,188.30**	**$7,739.84**	**$6,945.30**	**$2,914.96**	**$15,020.27**	**$6,567.93**		**$5,779.78**		**$788.15**
Unadjusted Development Charge Per Capita ($)								**$1,282.40**		
Unadjusted Development Charge Per Sq. M. ($)										**$25.84**

Note: As many of the works are being designed to benefit growth both in this period and beyond the 10-year planning period, a share of the costs are considered to be recovered from future DCs outside this planning period

CITY OF CLARENCE-ROCKLAND
COMPARISON OF CURRENT AND CALCULATED
RESIDENTIAL DEVELOPMENT CHARGES

Service	Current Residential Charge / SDU	Calculated Residential Charge / SDU	Difference in Charge	
Discounted Services*				
Library Services	$228	$228	$0	0%
General Government	$212	$212	$0	0%
Parks And Recreation	$2,739	$2,739	$0	0%
By-Law Enforcement	$5	$5	$0	0%
Subtotal Discounted Services*	**$3,184**	**$3,184**	**$0**	**0%**
Transit and Protection Services				
Transit	$135	$0	($135)	(100%)
Fire Protection	$944	$1,034	$90	10%
Subtotal Transit and Protection Services	**$1,079**	**$1,034**	**($45)**	**(4%)**
Services Related to a Highway				
Public Works	$861	$968	$107	12%
Roads And Related	$3,920	$8,356	$4,436	113%
Services Rel. to a Highway Charge Per Unit	**$4,781**	**$9,324**	**$4,543**	**95%**
Engineered Services				
Waterworks	$1,048	$2,608	$1,560	149%
Sanitary Sewage	$5,967	$3,818	($2,149)	-36%
TOTAL RESIDENTIAL CHARGE BY UNIT TYPE (fully serviced)	**$16,059**	**$19,968**	**$3,909**	**24%**

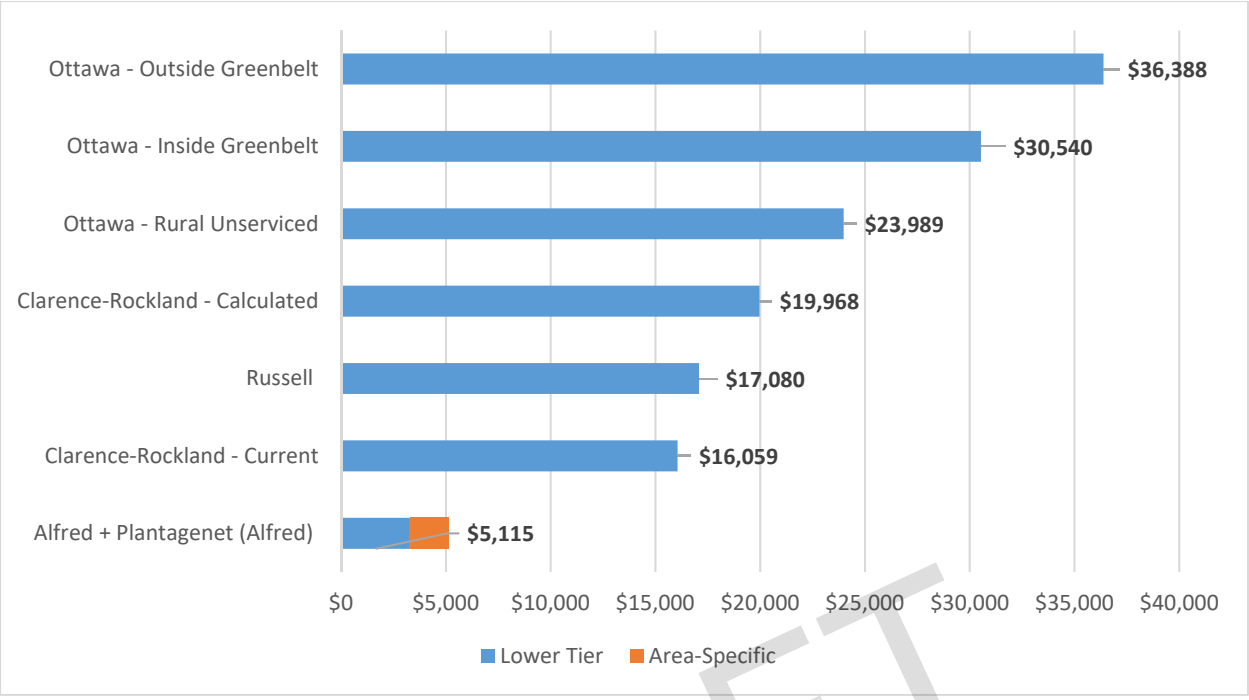
* As presented in By-law 2015-13 (indexed to current dollar) as permissible under Bill 108

CITY OF CLARENCE-ROCKLAND
COMPARISON OF CURRENT AND CALCULATED
NON-RESIDENTIAL DEVELOPMENT CHARGES

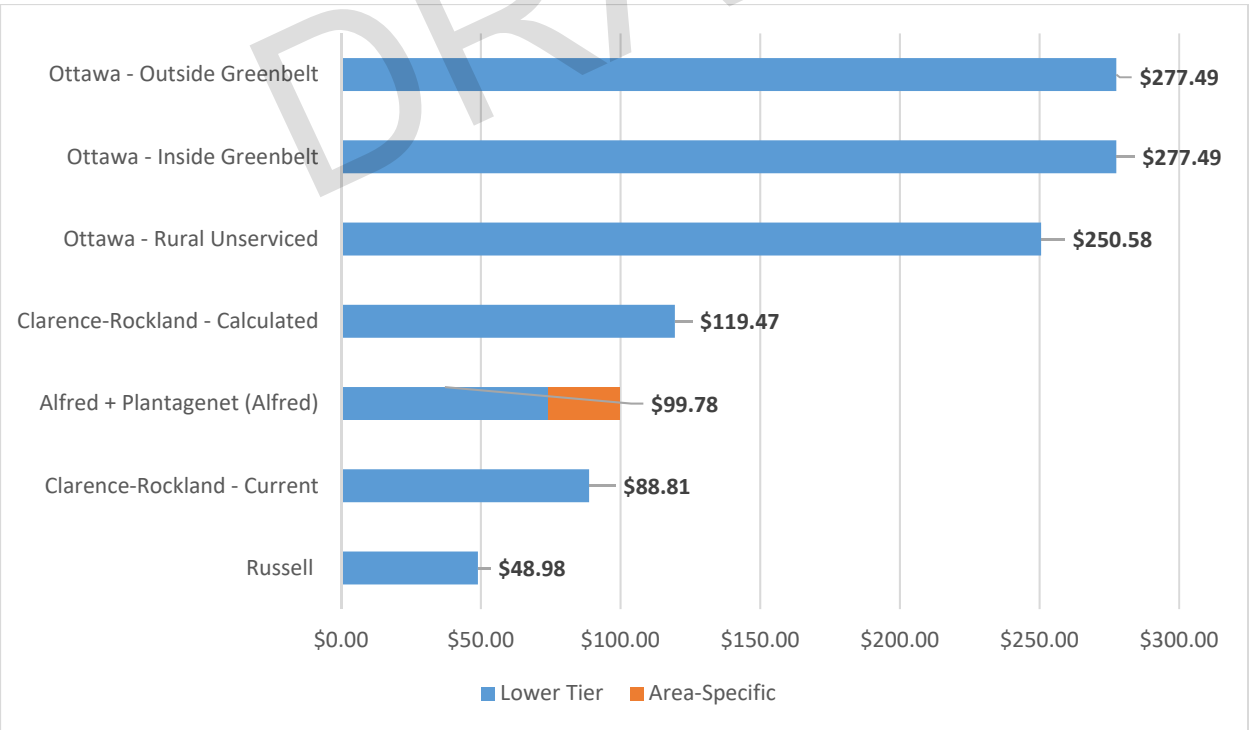
Service	Current Non-Residential Charge / Sq.m	Calculated Non-Residential Charge / Sq.m	Difference in Charge	
Discounted Services*				
Library Services	$0.00	$0.00	$0.00	0%
General Government	$1.45	$1.45	$0.00	0%
Parks And Recreation	$0.00	$0.00	$0.00	0%
By-Law Enforcement	$0.02	$0.02	$0.00	0%
Subtotal Discounted Services*	**$1.47**	**$1.47**	**$0.00**	**0%**
Transit and Protection Services				
Transit	$0.91	$0.00	($0.91)	(100%)
Fire Protection	$6.41	$7.27	$0.86	13%
Subtotal Transit and Protection Services	**$7.33**	**$7.27**	**($0.06)**	**(1%)**
Services Related to a Highway				
Public Works	$5.85	$6.81	$0.96	16%
Roads And Related	$26.60	$58.72	$32.12	121%
Services Rel. to a Highway Charge Per sq.m	**$32.45**	**$65.53**	**$33.08**	**102%**
Engineered Services				
Waterworks	$7.12	$18.35	$11.23	158%
Sanitary Sewage	$40.44	$26.85	($13.59)	-34%
TOTAL NON-RESIDENTIAL CHARGE PER SQ M (fully serviced)	**$88.81**	**$119.47**	**$30.66**	**35%**

* As presented in By-law 2015-13 (indexed to current dollar) as permissible under Bill 108

Residential Development Charge Rate Comparison – Single Family Detached Unit (Serviced)



Non-Residential (Non-Industrial Serviced) Development Charge Rate Comparison – $ per m2



Date	Event	Comments
August 23rd	Developer Review Period Over	
Week of September 2nd	Respond to development comments received	
September 16th	Staff report to council to provide timeline/update	
September 18, 2019	Release of the Background Study (online)	60 days before by-law passage (Nov 18) + 2 weeks before public meeting
October 1, 2019	Notice of Public Meeting (in a newspaper of general circulation)	20 days before the PM
October 4, 2019	Release the By-law	2 weeks before the PM
October 21, 2019	Public Meeting	
October 22 – November 11	Respond to any written submissions/comments received from the Public Meeting	
November 18, 2019	Target By-law Passage	
December 2nd	Secondary (or fall back) date to pass by-law.	

http://www.clarence-rockland.com/images/Calendrierreunionsduconseil2019webcolor.pdf