



## The Corporation of the Town of Tecumseh

Parks & Recreation Services

**To:** Mayor and Members of Council

**From:** Paul Anthony, Director Parks & Recreation Services

**Date to Council:** September 10, 2019

**Report Number:** PRS-2019-11

**Subject:** Energy Conservation and Demand Management Plan Review

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### Recommendations

It is recommended:

**That** Parks and Recreation Report PRS-2019-11, Energy Conservation and Demand Management Plan Review, **be received** for information.

### Background

The *Green Energy Act* (Act) was passed on May 14, 2009. The intent of the Act is to:

- Expand renewable energy production,
- Encourage energy conservation, and
- Create clean energy jobs

O Reg. 397/11 requires that municipalities:

- Prepare, publish, make available to the public and implement Energy Conservation and Demand Management Plans (ECDM).
- On or before July 1 of each year commencing in 2013, submit to the Minister, publish on its website and make available to the public in printed form the Annual Energy Consumption and Greenhouse Gas (GHG) Emissions Template for operations.
- On or before July 1, 2019, and on or before every fifth anniversary thereafter, a description of current and proposed measures for conserving and otherwise reducing energy consumption and managing its demand for energy is to be completed in an

updated plan. This plan would be a revised forecast of the expected results of the current and proposed reduction measures, a report of the actual results achieved, and a description of any proposed changes made to assist in reaching any targets it has established.

Council adopted the Town’s initial ECDM Plan on April 14, 2015.

This is the annual report provided to Council to review progress made towards our energy reduction targets and details on initiatives being considered for future implementation.

In 2018 the *Green Energy Act* was repealed, however the annual energy consumption reporting and publication of an ECDM Plan were incorporated verbatim into the *Energy Act 1998, Ontario Regulation 507/18 Broader Public Sector: Energy Reporting Conservation and Demand Management Plans* and thus are still in effect.

## Comments

### ECDM Plan – Targets

The Town’s ECDM Plan includes an energy consumption reduction target to be reached by 2019. There was not a target established for GHG emission reduction.

Specifically, the ECDM Plan targeted a 10% reduction in energy consumption as compared to 2011 Base Data. We have added a similar reduction target for GHG emissions, post ECDM Plan adoption.

Revised 2011 Base Data and Target reduction are detailed in Table 1. An Energy Intensity measure is also provided. For the Facilities category, Energy Intensity is a measure of energy consumption with respect to floor space and is expressed as “equivalent kWh per square metre” or ekWh/m<sup>2</sup>. For the Optional categories, Energy Intensity is a measure of energy consumption with respect to unit count.

Table 1 – Energy Consumption – Revised Base Data and Targets

| Table 1 - Revised Base Data |                       | Unit of        |             |               |              | Base Energy Intensity  |
|-----------------------------|-----------------------|----------------|-------------|---------------|--------------|------------------------|
|                             | Energy Source         | Measurement    | Total Usage | 10% Reduction | Target Usage | (ekWh/m <sup>2</sup> ) |
| Facilities                  | Electricity           | kWh            | 2,260,435   | 226,044       | 2,034,392    | 176                    |
|                             | Natural Gas           | m <sup>3</sup> | 239,918     | 23,992        | 215,926      | 200                    |
|                             |                       | Unit of        |             |               |              | Energy Intensity       |
|                             |                       | Measurement    | Total Usage | 10% Reduction | Target Usage | (Usage/Unit)           |
| Optional Categories         | Street Lights (Elec.) | kWh            | 2,080,227   | 208,023       | 1,872,204    | 993                    |
|                             | Fuel                  | Litres         | 167,579     | 16,758        | 150,821      | 2,501                  |

In the original Base Data and Targets of 2011 for fuel, the value used for diesel fuel of the Transit Bus was unavailable and an estimated quantity was used.

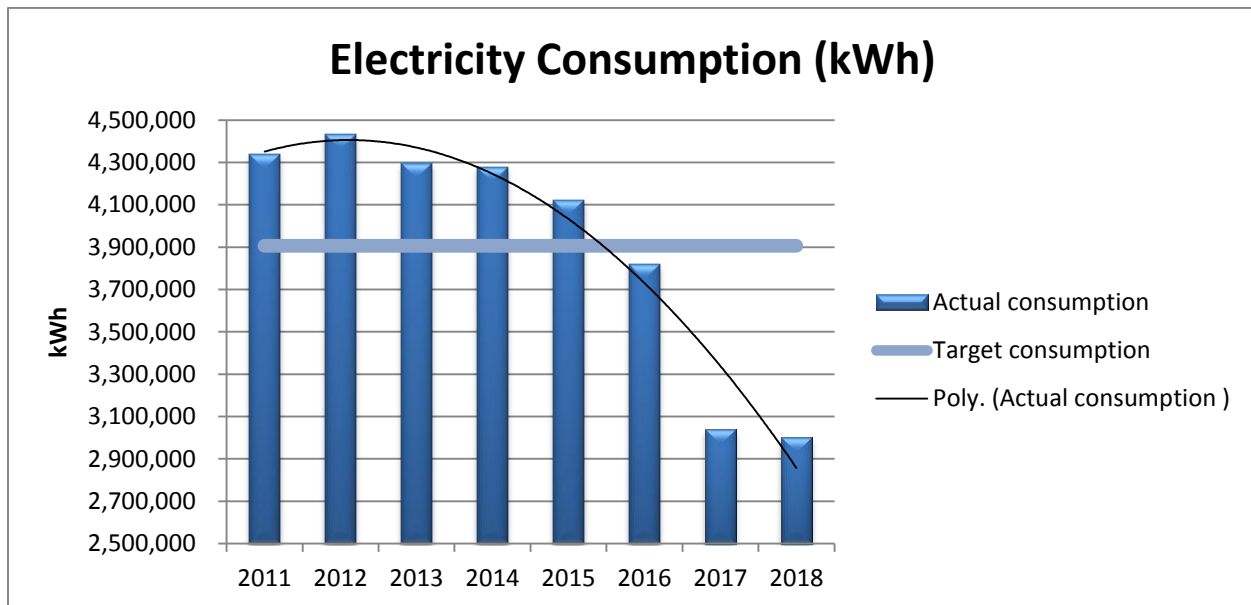
Table 2 provides Revised 2011 Base Data with respect to GHG emissions. An Emission Intensity measure is also provided. For the Facilities category, Emission Intensity is a

measure of GHG emissions with respect to floor space and is expressed as KG per square metre or KG/m<sup>2</sup>. For the Optional categories, Emission Intensity is a measure of KG with respect to unit count.

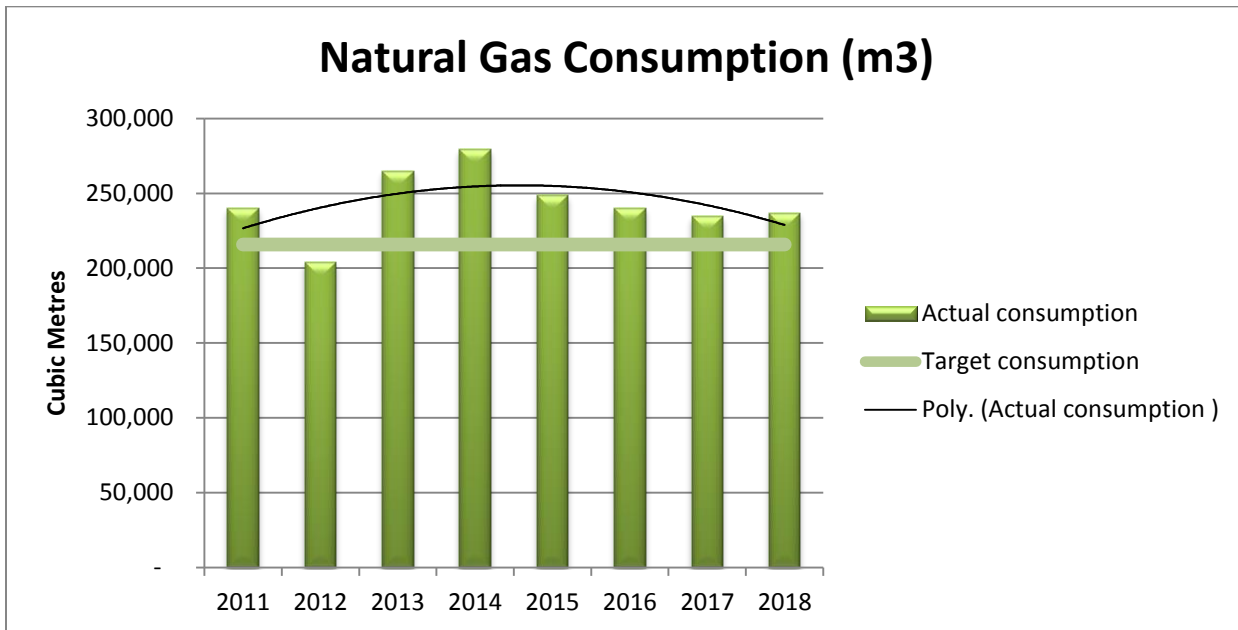
Table 2 – GHG Emissions – Base Data and Targets

| Table 2 - Revised Base Data |                       |                       |               | Target        | Base GHG Emission | Target GHG         |
|-----------------------------|-----------------------|-----------------------|---------------|---------------|-------------------|--------------------|
|                             | Energy Source         | Emissions (KG)        | 10% Reduction | Emission (KG) | Intensity         | Emission Intensity |
| Facilities                  | Electricity           | 180,835               | 18,083        | 162,751       | 14                | 13                 |
|                             | Natural Gas           | 453,595               | 45,360        | 408,236       | 36                | 32                 |
|                             |                       |                       |               |               |                   |                    |
|                             |                       | <b>GHG</b>            |               |               |                   |                    |
|                             |                       | <b>Emissions (KG)</b> |               |               |                   |                    |
| Optional Categories         | Street Lights (Elec.) | 166,418               | 16,642        | 149,776       | 79                | 71                 |
|                             | Fuel                  | 402,495               | 40,250        | 362,246       | 6,007             | 5,407              |

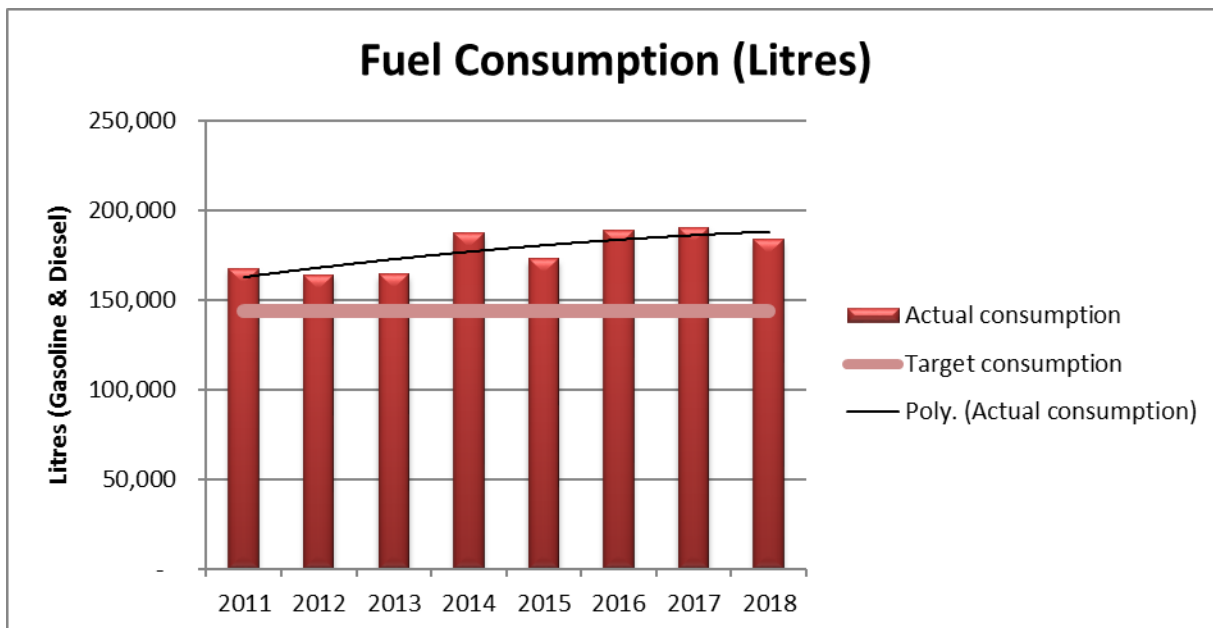
The following charts reflect consumption/emission trends since 2011 and include our 2019 target levels for comparison. Weather will influence consumption in particular periods, so the emphasis should be placed on long-term averages and trends.



Gross electricity consumption has trended downwards benefitting largely from the conversion of Town street lights to LED technology. Additionally, most early energy conservation initiatives, such as indoor lighting fixture retrofits, light motion sensors and programmable thermostats have influenced electricity consumption.

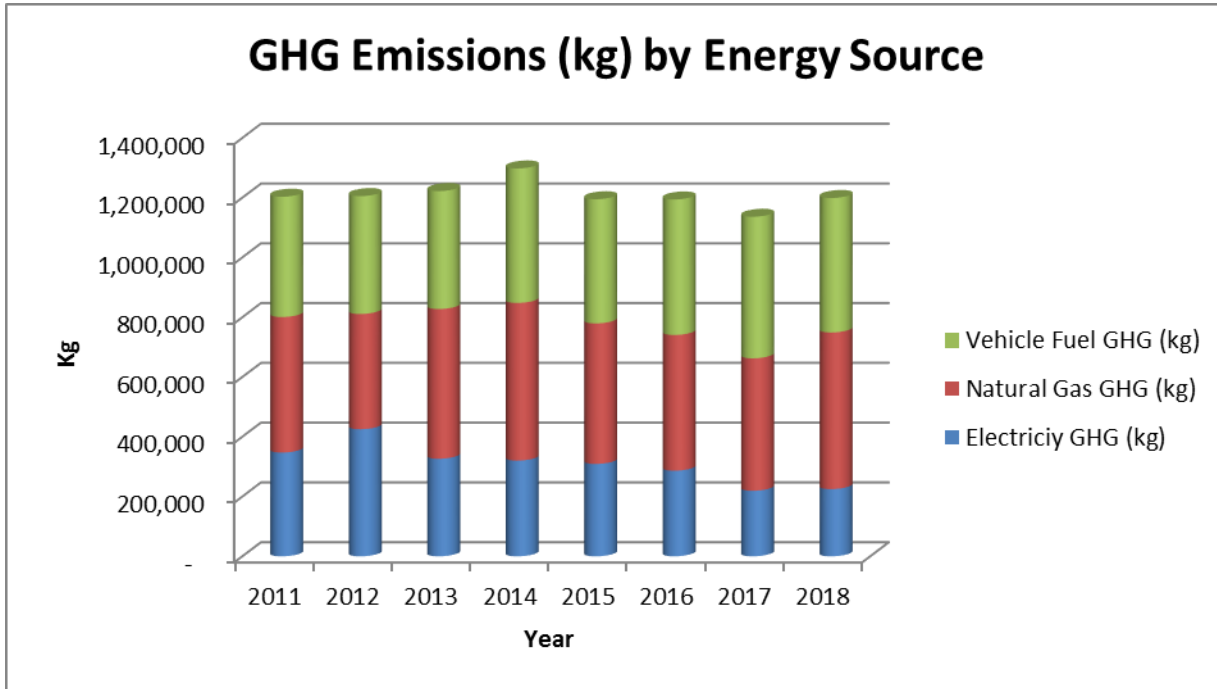


Natural gas consumption is virtually unchanged. However, there has been additional floor space added since 2011 - a total of 355 square meters of indoor space to the arena (80 sq. m's in 2012 and 275 sq. m's in 2014). There were 84 square meters of indoor floor space added to Fire Hall #2 for the new museum in 2018. The spike in consumption in 2013-2014 was largely attributable to extreme cold winter conditions experienced during those two years.



Fuel consumption has increased since 2011. Some of the increased consumption can be attributed to park maintenance activity for significant parkland added since 2011, including Lakewood Park and McAuliffe Park. The level of service for winter control in both Parks and Public Works fleet activity has been relatively consistent over the years. As fuel consumption is a primary GHG producer, future initiatives should focus on ways to reduce fuel consumption.

The original data for fuel consumption for the Transit Bus was estimated from specifications supplied by manufacturer. For this report the actual values obtained from the Transit Bus Operator have been used for 2018 only.



Total annual GHG emissions have been relatively constant over the eight-year period, ranging from a high of 1,278,759 KG in 2014 to a low of 1,048,783 KG in 2017.

Table 3 compares 2016-2018 average annual consumption and intensity data as compared to our targets.

| Table 3 - 2016-2018 Average Usage |                       | Unit of Measurement | 2016 - 2018 Avg Annual Usage | Target Usage | 2016-2018 Avg. Energy Intensity (ekWh/m2)     | Target Energy Intensity |
|-----------------------------------|-----------------------|---------------------|------------------------------|--------------|---|-------------------------|
| Facilities                        | Electricity           | kWh                 | 2,131,706                    | 2,034,392    | 142   | 158                     |
|                                   | Natural Gas           | m3                  | 237,193                      | 215,926      | 171   | 180                     |
|                                   |                       | Unit of Measurement | 2016- 2018 Avg Annual Usage  | Target Usage | 2016- 2018 Avg. Energy Intensity (Usage/Unit) | Target Energy Intensity |
| Optional Categories               | Street Lights (Elec.) | kWh                 | 1,154,638                    | 1,872,204    | 541   | 894                     |
|                                   | Fuel                  | Litres              | 187,726                      | 150,821      | 2,644   | 2,251                   |

Average annual gross consumption exceeds our 2019 target levels in all categories except street lights. We have been able to achieve 2019 target levels for average energy intensity with respect to facility electricity, natural gas consumption and street lights, fuel continues to be above the targeted intensity levels.

Table 4 compares 2016-2018 average annual emissions and intensity data as compared to our targets.

| Table 4 - 2016-2018 Average GHG |                       | Unit of       | 2016-2018 Avg Annual | Target             | 2016-2018 Avg GHG  | Target GHG |
|---------------------------------|-----------------------|---------------|----------------------|--------------------|--------------------|------------|
| Energy Source                   | Measurement           | GHG Emissions | Emission (KG)        | Emission Intensity | Emission Intensity |            |
| Facilities                      | Electricity           | KG            | 159,878              | 162,752            | 11                 | 13         |
|                                 | Natural Gas           | KG            | 473,784              | 408,236            | 32                 | 32         |
|                                 |                       |               |                      |                    |                    |            |
| Optional Categories             | Street Lights (Elec.) | KG            | 86,598               | 149,776            | 41                 | 71         |
|                                 | Fuel                  | KG            | 459,078              | 362,246            | 6,466              | 5,407      |

We have reached our 2019 targets for average annual GHG emissions for Facility electricity and street lights; however, we have exceeded our 2019 target levels in Facility natural gas and Fuel. GHG Emission Intensity is below our target level for Facility electricity and Street Lights, and at the 2019 target for Facility natural gas. Our target emissions for Fuel Intensity is higher than the 2019 target level.

### Measuring Progress

Average annual Energy/emission intensity data for 2016-18 is compared to 2011 base data in Table 5 as an alternative measure of progress made towards consumption and emission reductions.

Table 5 data indicates that progress towards improved consumption efficiency and improved GHG emission reduction has been positive in all categories except with respect to fuel.

| Table 5 - Average Intensity vs Base |                            | Base                       | 2016-2018 |                        | Base                   | 2016-2018 |      |
|-------------------------------------|----------------------------|----------------------------|-----------|------------------------|------------------------|-----------|------|
| Energy Source                       | Energy Intensity (ekWh/m2) | Energy Intensity (ekWh/m2) | Change    | GHG Emission Intensity | GHG Emission Intensity | Change    |      |
| Facilities                          | Electricity                | 176                        | 142       | -19%                   | 14                     | 11        | -24% |
|                                     | Natural Gas                | 200                        | 171       | -15%                   | 36                     | 32        | -10% |
|                                     |                            |                            |           |                        |                        |           |      |
| Optional Categories                 | Street Lights (Elec.)      | 993                        | 541       | -46%                   | 79                     | 41        | -49% |
|                                     | Fuel                       | 2,501                      | 2,644     | 6%                     | 6,007                  | 6,466     | 8%   |

### Recent Town Accomplishments

#### Staff Engagement

As part of “Earth Day,” the Energy Management Team initiated some ideas to get involvement from Town staff at large. The Team had “Earth Week” with various initiatives listed below. These type of ideas will continue in the future.

One initiative was a “Lights out” for 1 hour. This was to try to promote the concept of turning lights out in any room when not in use.

A second idea was to have a “Garbageless Lunch”. This was an attempt to encourage staff to reduce waste, and the amount of waste the Municipality would be sending to the landfill. Landfills are producers of GHG’s.

A third initiative was the planting of trees in strategic locations to add shade at particular buildings and the team asked staff if they wished to participate in the planting of trees. Trees

create natural shade barriers to reduce the affect of the sun on those buildings. The cost of that project was \$1,000.

One particular location that will see some reduction in that effect in the future is the Water Environmental Building. It is the hope of the Team that future locations like the St. Clair Beach Community Centre can benefit from strategically located tree planting come the fall of 2019.

### **St Clair Beach Tennis Court Light Replacement**

These lights were High Pressure Sodium and switched to LED. The lights used to be on a timer and would come on 7 days a week rain or shine. As part of the project, an activation switch was installed; the lights have to be activated by participating players. Once the switch is pushed, the lights will stay on for 2 hours. If players are still playing, the switch has to be pushed again. There is no significant down time between activation.

### **Pylon Sign in Front of the Arena**

The wind damaged the pylon sign in front of the Arena. As part of the repair it was recommended by the Energy Team to replace the high output T12 florescent light fixtures with LED equivalent lighting.

There were other low-level projects completed, such as replacement of light bulbs in Council Chambers and other rooms within the Town Hall.

### **Collaborative Initiatives**

ERCA has requested assistance to undertake preliminary stages for a community energy plan. This assistance would support a student until December 2019. The student would collect data as part of the climate change planning they have started. This would go towards completing the first step of their “Partners for Climate Protection” framework. The Green Energy Team is behind this endeavour; it supports this idea of community energy planning. It has committed \$2,500 in financial support, funded through the 2019 Operating Budget.

### **Walkthrough Audits**

Town Energy Committee members perform walkthrough audits. These audits help to identify energy users and potential energy saving initiatives. Some facility improvements triggered by walkthrough audits have been weather stripping replacement around doors and some single-pane window replacements. Walkthrough audits are completed for each facility on a 4-5-year cycle.

### **Potential Opportunities**

#### **Energy Efficient Design of Facilities**

With the expansion of the Town Hall, there is an opportunity to update the use of energy efficient measures for this building operation. There will be Energy Efficient technology throughout the existing and proposed floor area, such as; LED lighting, the introduction of natural lighting sources and building automation controls.

The installation of a “Level 3 fast charger” electric vehicle charging station would provide a new customer service for residents and visitors with electric vehicles to the Town Hall. These types of opportunities will provide for a ‘greener’ building and reduce energy utility costs.

Another opportunity that will influence the Town’s energy consumption is the expansion to the Arena. The design of the structure should accommodate rooftop solar panels. The inside design would focus on low energy use solutions including, building automation systems, LED lighting, high insulation construction materials and free ambient cooling and heating from the existing refrigeration plant whenever possible.

This is an opportunity to be a Leader in Energy and Environmental Design (LEED), one of the most popular ‘green building’ certification programs used worldwide. It includes a rating system for design, construction, operation and maintenance of green buildings, homes and neighbourhoods that aims to help building owners and operators be environmentally responsible and use resources efficiently.

Any energy efficient measure used in the design for these buildings will follow the goals of the original ECDM plan to improve the energy efficiency of the corporation by utilizing best practices to reduce the operating costs, energy consumption and greenhouse gas emissions within financial constraints.

### **ECDM Plan Update**

The updated ECDM plan is in the final stages. Part of that update is to bring forward new energy conservation goals and objectives, summarize the results of the first ECDM plan and any changes made from the first plan to help achieve the new goals and objectives.

Part of the new plan is to keep staff informed on energy conservation and building operation best practices; this is an attempt to influence possible conservation behavioural measures. The plan will try to build an energy conservative work force to reduce energy consumption.

### **Consultations**

Financial Services  
Parks & Recreation Services

### **Financial Implications**

All minor initiatives are funded through the Recreation Services Maintenance Budget of \$10,000. This includes low-cost facility upgrade initiatives and for use towards corporate awareness initiatives. Larger dollar initiatives would be considered via the Buildings Five Year Capital Budget plan and construction design and build tenders (i.e. Town Hall and Arena).



## Link to Strategic Priorities

| Applicable | 2019-22 Strategic Priorities |
|------------|------------------------------|
|------------|------------------------------|

- Make the Town of Tecumseh an even better place to live, work and invest through a shared vision for our residents and newcomers.
- Ensure that Tecumseh’s current and future growth is built upon the principles of sustainability and strategic decision-making.
- Integrate the principles of health and wellness into all of Tecumseh’s plans and priorities.
- Steward the Town’s “continuous improvement” approach to municipal service delivery to residents and businesses.
- Demonstrate the Town’s leadership role in the community by promoting good governance and community engagement, by bringing together organizations serving the Town and the region to pursue common goals.

## Communications

Not applicable

Website       Social Media       News Release       Local Newspaper

This report has been reviewed by Senior Administration as indicated below and recommended for submission by the Chief Administrative Officer.

Prepared by:

Ray Hammond, RRFO, CARPT  
Manager Facilities

Reviewed by:

Tom Kitsos, CPA, CMA, BComm  
Director Financial Services & Chief Financial Officer

Reviewed by:

Paul Anthony, RRFA  
Director Parks & Recreation Services

Recommended by:

Margaret Misek-Evans, MCIP, RPP  
Chief Administrative Officer

**Attachment  
Number**

None

None