

TAY VALLEY TOWNSHIP



ENERGY CONSERVATION & DEMAND MANAGEMENT PLAN, 2024-2029

August 28, 2024

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2 INTRODUCTION

2.1 Purpose and Background

The Ontario Government requires the Broader Public Sector (municipalities, universities, schools and hospitals) to better understand and manage their energy consumption.

Specifically, Ontario Regulation 25/23 requires that Tay Valley Township report its annual energy use to the Ministry of Energy, Northern Development and Mines and that the Township develop *Energy Conservation and Demand Management (CDM) Plans*.

Tay Valley Township is committed to energy conservation and management as an important component of its operations. It understands the social, environmental and financial implications of energy management and is working to deliver improvements in a responsible way.

Through monitoring of energy usage, facility renovations and building service equipment upgrades the Municipality is committed to managing and reducing energy consumption across its facilities and operations.

As part of this commitment, the Municipality undertook a building condition assessment for its facilities in 2020 and updated its Asset Management Plan in 2020 to include several items related to energy consumption and integrating energy management as an important factor in its operations.

In August 2020, the Municipality adopted its first *Climate Change Action Plan* (with funding from the Federation of Canadian Municipalities) aimed at reducing Greenhouse Gas (GHG) emissions. Tay Valley Township will also be working with Lanark County on joint opportunities to reduce GHGs and save money through energy conservation and management.

Tay Valley developed its CDM plan in the first iteration of this program in 2014 that was updated in 2019. This 2024 Plan follows amendments incorporated in the current regulation which includes a new reporting platform for energy data. More details can be found in APPENDIX B - COMPLIANCE WITH O. Reg 25/23.

Tay Valley Township agrees with Lanark County's analysis of the environmental, societal, and fiscal pressures that necessitate an energy management plan.

Environmental Pressures

In October 2018 the Intergovernmental Panel on Climate Change (IPCC) published *The Special Report on Global Warming of 1.5°C (SR15)*. This report captured the world's attention. It found that while the planet's temperature is currently on track to increase by more than 3°C, by 2100, the world could limit its temperature increase to only 1.5°C (2.7°F).

However, it warned this would require "deep emissions reduction" and "rapid, far-reaching and unprecedented changes in all aspects of society." Global GHG emissions must fall by 7.6 per cent each year between 2020 and 2030 to hold to the 1.5°C increase.

Societal Pressures

The 2003 summer electricity blackout and 2013 Toronto ice storm blackout heightened societal concerns about the stability and security of Ontario's energy supply. If energy is not conserved and managed appropriately the frequency of energy interruption and subsequent societal disruption will increase.

Fiscal Pressures

Fossil fuels traditionally used to generate energy are becoming no longer financially viable nor environmentally acceptable. Renewable energy is becoming cheaper every year.

2.2 Key Implemented Actions

The Municipality submitted annual Energy Consumption, Greenhouse Gas and Cost reports beginning in 2014 through 2019.

In 2015, all the Township-owned streetlights were converted to LED lights. The existing streetlighting network consumed 23,803 kWh per year. By upgrading to LEDs, the annual energy consumption was reduced to approximately 8,886 kWh per year, or an impressive reduction of 63%.

Energy audits for all municipal buildings were undertaken and additional insulation was added to one of the three township owned buildings – Maberly Hall – resulting in a 2,404 kWh reduction between 2014 and 2018 or a 35% decrease in energy consumption.

Examples of projects completed in the last five years are shown in the photos below.



Photo 1. Maberly Hall, LED Lighting

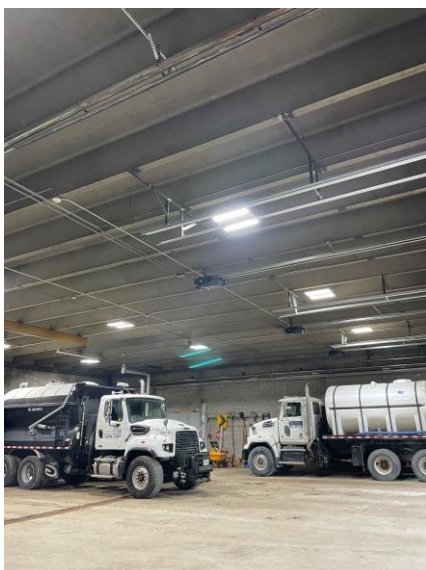


Photo 2. Bathurst Garage, LED Lighting



Photo 3. Bathurst Garage, Insulated Doors

3 COMMITMENT

Effective energy management begins with the specific, visible expression of commitment by the senior authorities in the municipality to making the reduction of energy consumption an organizational priority. This commitment includes continuing resolutions by Municipal Council articulating that staff plan and implement measures for energy efficiency improvement. Regardless of the size of the municipality, the common element of successful energy management is the allocation of staff and resources to continually improve energy performance.

3.1 DECLARATION OF COMMITMENT

The following two resolutions were adopted by Tay Valley Township regarding approval of the 2020 CDM Plan and declaration of a climate change crisis in 2024. This second resolution is related to the CDM Plan because regulation 25/23 requires the reporting of emissions and renewable energy generation. The generation of energy from renewable sources significantly reduces emissions compared to other forms of energy generation. Reduction of GHG emissions is mentioned in the climate change crisis resolution.

RESOLUTION #C-2020-09-03

“THAT, the revised Energy Conservation and Demand Management Plan dated August 28, 2020, based on the *Tay Valley Climate Action Plan* be approved and submitted to the Ministry of Energy, Northern Development;

AND THAT, staff begin to plan and implement measures for energy efficiency improvements in accordance with the Tay Valley Township Energy Conservation and Demand Management Plan.”

ADOPTED

RESOLUTION #C-2024-02-15

“WHEREAS, climate change annually contributes to hundreds of billions of dollars in property and infrastructure damage worldwide, stressing local to national and international economies;

WHEREAS, climate change jeopardizes the health and risks the extinction of millions of species worldwide, stressing and weakening the health and integrity of ecosystems everywhere;

WHEREAS, climate change harms the health and security of people through intense wildfires, flooding, storms, droughts, rising sea levels, the spread of invasive insects bearing diseases, negative impacts on agriculture, and food supply interruption, thus further stressing social, economic, and political systems;

WHEREAS, there is now a large body of evidence and climate change risk scenarios which point to the imperative for steep and permanent reductions in greenhouse gas emissions, immediately and in the coming decades, in order to avoid many climate change “tipping points” which, if crossed, will render further and devastating ecological, economic, and societal losses;

AND WHEREAS, a crisis can be defined as "a dangerous situation requiring immediate action";

NOW THEREFORE BE IT RESOLVED THAT, Tay Valley Township officially declares a climate change crisis for the purposes of naming, framing, and deepening our commitment in our climate action plan to protecting our local ecosystems, local economy, and our community from climate change;

THAT, this resolution be revisited each term of Council and within the first year of the new council;

AND THAT, this resolution be provided to Prime Minister Trudeau and all federal ministers with portfolios related to climate change; to all federal Opposition party leaders; to MP Scott Reid; to Premier Ford and all Ontario ministers with portfolios related to climate change; to MPP John Jordan and all other Ontario MPPs; to all Ontario Municipalities and the local media.”

ADOPTED

The CDM Plan is comprised of the core elements required by O. Reg 25/23 (as outlined in Appendix B). The Plan provides for the management of the following energy resources: electricity, natural gas, propane, and oil in buildings.

This Plan is not a general plan for the community, but a tool for the municipal corporation to manage its energy consumption to reduce its carbon footprint and to control its energy costs. The Plan is available on the Township website (www.tayvalleytwp.ca) and made available in print at the Municipal Office, located at 217 Harper Road, Perth, Ontario, K7H 3C6.

3.2 VISION

The Township will be a leader in reducing energy consumption, associated costs, and greenhouse gas emissions by adopting energy solutions that lead to environmental, social and economic benefits.

3.3 GOALS, OBJECTIVES, TARGET

Consistent with Lanark County’s triple bottom line (environment, economy, society) approach, Tay Valley’s goals are to:

- be a leader in the community for energy conservation and GHG reduction;
- manage energy costs; and
- support our residents in learning about resilient energy options.

In September 2019 Tay Valley residents were asked at two public participation sessions to choose one of four key directions the Township could take in setting reduction targets. The four options were the Status Quo, Baby Steps, Show Leadership or Major Transformation, roughly representing GHG reductions of 20%, 40%, 60% and 80% respectively. Table 1 – Survey Results indicates that major transformation had the largest percentage of votes at 68%.

Table 1. Survey Results

Target	% Votes
Status Quo	0%
Baby Steps	0%
Show Leadership	32%
Major Transformation	68%

In February 2020 residents met again to confirm a GHG reduction target and to evaluate a set of potential actions and to recommend any additional actions. The participants enthusiastically supported the most recent recommendation from the International Panel on Climate Change (IPCC) of a 7.6% global reduction in GHGs each year for the next 10 years to 2030. This accrues to a 55% reduction over the 10 years.

3.4 GREEN ENERGY AND CLIMATE CHANGE WORKING GROUP

Tay Valley Township appointed a Green Energy and Climate Change Working Group in 2018. The Working Group has been invaluable in helping to prepare Tay Valley’s Climate Action Plan and in developing a Climate Lens for use by the Township in budgeting and procurement decisions. The Working Group also provides expert advice on alternative energy options for the Township to consider, such as cold climate heat pumps. From the NRCan website:

“A new generation of air source heat pumps (called cold climate air source heat pumps) are now available in Canada. Cold climate air source heat pumps are specially adapted to our cold Canadian climate and can effectively heat your home even when outdoor temperatures are as cold as -30°C. Like conventional air-source heat pumps, these systems also provide efficient heating at milder conditions, and cooling to your home during warmer months. Cold climate systems can help your home achieve even greater energy savings by reaching efficiencies up to 3 times higher than oil furnaces or boilers.”¹

These heat pumps are also available from manufacturers for commercial applications.

3.5 COMMUNITY ACTIONS

The Climate Change Working Group is also involved in actions to reduce community emissions including new builds and resident engagement. For the former action, building officials will be informing builders about ENERGY STAR ratings for new builds; the National Building Code is expected to require ENERGY STAR ratings for all homes. Regarding the latter, residents will be informed about financing for energy efficiency improvements.

¹ <https://natural-resources.canada.ca/energy-efficiency/homes/canada-greener-homes-initiative/oil-heat-pump-affordability-program/why-use-heat-pump/24914>

4 ENERGY CONSUMPTION AND GHG EMISSIONS

The Township’s energy consumption and emissions summary based on 2023 electricity, natural gas and propane data, can be found in Appendix A - Energy Consumption and Emissions Summary (2023). A requirement of O. Reg 25/23 involves municipalities reporting electricity and gas consumption as well as emissions to the Ministry of Energy on an annual basis. A pie graph of the consumption for all facilities is shown below and the figures are a percentage of the number² of Joules for each fuel type divided by the total number of Joules. Electricity consumption in 2023 was 105,270 kWh. Natural gas and propane were 756,850 kBtus and 270,992 kBtus respectively.

Figure 1. Energy Use Breakdown by Fuel Type

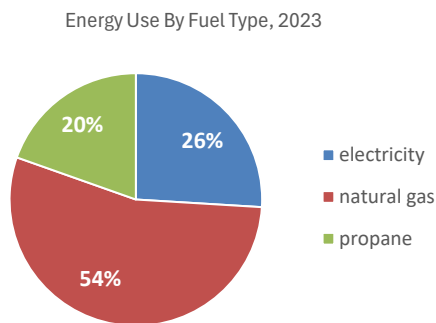
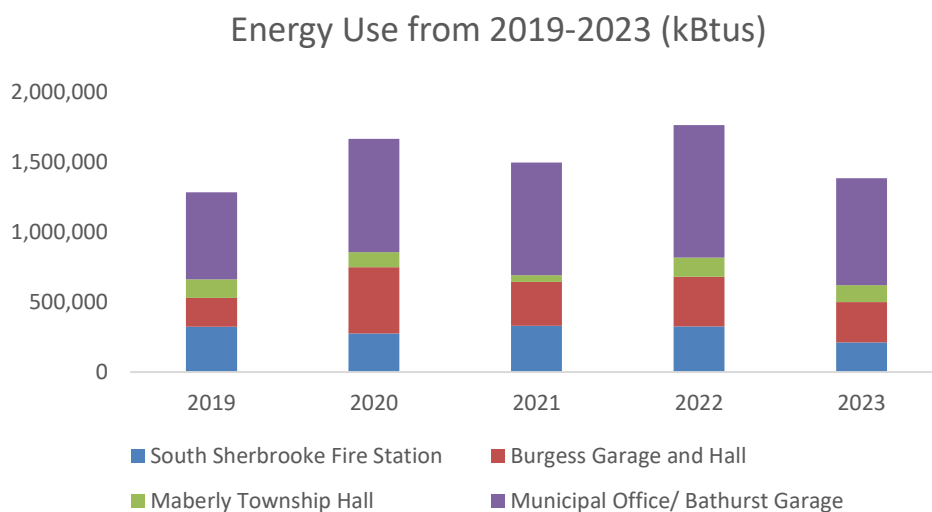


Table 2. Fuel Type and Quantity

Fuel Type (gigajoules)		
electricity	natural gas	propane
379	795	286

The energy data from 2019-2023 show a decrease in the Township’s consumption from 2022 to 2023. The Municipal Office and Bathurst Garage are the largest energy consumers.

Figure 2. Energy Use from 2019-2023



² A joule is defined as watt-second. A watt is the amount of energy that an electrical device (such as a light) is burning per second that it's running, thus a 10W (LED) bulb is burns 10 Joules energy every second.

Of the sources of fossil fuels consumed by the Municipality, natural gas is used for the heating system at the Municipal Office, and propane is used in other Township buildings. Fuel oil has been phased out.

5 PRIORITY ACTIONS SUPPORTING ENERGY CONSERVATION GOALS

Tay Valley Council adopted its first *Climate Action Plan* (funded by a grant from the Federation of Canadian Municipalities) in August 2020. That Plan identified essential actions to manage energy costs and reduce Greenhouse Gases. The first action is to assign a lead staff responsible for delivering the Plan. The CDM Plan can support the Climate Action Plan by reducing GHG emissions from their municipal facilities. For these reductions, past, present and future actions as well as opportunities are shown in Section 6.

5.1 FUNDING

Steep reductions in emissions--as indicated in the Council Resolution found in Section 3 - Commitment--usually require some form of renewable energy which is capital intensive. Thus, it is recommended that additional funding be sought. Some options could be:

1. **Energy Budget:** Incorporate energy budget accountability into departmental responsibilities.
2. **Revolving Fund:** Accrue savings from energy demand and conservation projects into a reserve that could be used to fund future projects.
3. **Third Party Fund(s):** Seek external funding and one example being the Green Municipal fund which is a program by the Federation of Canadian Municipalities.

Note that combination of the above options may also be possible to fund net zero retrofits of the Township's corporate buildings by a pre-determined target date. The federal government has declared their target date to be 2050 under the Net-Zero Emissions Accountability Act.³

³ <https://laws-lois.justice.gc.ca/eng/acts/c-19.3/fulltext.html>

6 RESOURCES PLANNING AND PROJECT EXECUTION

The Township has identified several actions and opportunities to execute goals of the CDM Plan and achieve energy management benefits. Savings are on an annual basis, unless noted otherwise. Please note that completed actions are noted and listed at the beginning of the following table.

Table 3. Energy Management Actions and Opportunities

Objectives	Action	Estimated Energy and/or Cost Savings	Action Owner	Status or Completion Date
Efficiency and Conservation	Upgraded Bathurst Garage high bay lighting with LED lamps.	9434 kWh \$1132.19	Public Works Manager	Completed in 2020
	Upgraded Burgess Garage exterior lighting with LED lamps.	6022 kWh \$722.65	Public Works Manager	Completed in 2020
	Retrofitted Bathurst Garage door panels with additional insulation.	\$1625	Public Works Manager	Completed in 2020
	Retrofitted Maberly Hall Lighting with LED lamps.	Approximately 50% savings of lighting electricity consumption	Public Works Manager	Completed in 2023
	Plan to adopt LEED standards for future construction of Township buildings.	Energy consumption reductions to be determined	Chief Building Official	2040
	Existing windows in Township building (Municipal Office) are double glazed with wood frame and vinyl capping and it is recommended to replace with energy efficient windows.	Annual savings of 3-4%	Public Works Manager	2040 per BCA
	Existing heat recovery unit located in Garage attached to Municipal Office has been abandoned and is near end of life. It is recommended to replace this unit with new HRV and relocate to mechanical room.	Current sensible recovery efficiencies for HRV heating has improved by about 30% since 2010	Public Works Manager	2023

	<p>Existing package rooftop units in the Municipal Office that serve Lunchroom, Meeting Room, Council Chamber, Original Building, and South Addition may not be equipped with controls (including economizers) that could result in reductions to fan, cooling and heating energy use.</p> <p>Investigate the retrofit of RTUs with the latest advanced control strategies that could result in significant energy reductions.</p>	<p>Energy savings of up to 35% and cost savings of up to 38%</p>	<p>Public Works Manager</p>	<p>2025</p>
	<p>Existing lighting in Municipal Office mainly consists of 2x2' fluorescent lamps and some 4' fluorescent lamps. There are also exit signs and HID exterior lights.</p> <p>Though some of this lighting is listed in good condition in the current BCA, it is older technology, and it is suggested that a comprehensive lighting retrofit with lighting controls be investigated in the long term.</p>	<p>If LED lights are proposed as part of the investigation, there could be approximately 40-50% savings of electrical lighting consumption for fluorescent lamps and 60-70% for HID exterior lamps depending on existing lamp wattage for both types.</p>	<p>Public Works Manager</p>	<p>Completed Q2 of 2024</p>
	<p>Existing lighting in Bathurst Garage consists of compact fluorescent light fixtures in the northwest addition, T8 fluorescent light fixtures in the Lunchroom and Washroom and a T12 fluorescent suspended light fixture. There are also exit signs. Exterior lighting is HID wall packs on the southwest and northwest elevations with photocells.</p>	<p>Approximately 30-50% savings of lighting electricity consumption depending on operating hours.</p>	<p>Public Works Manager</p>	<p>Completed in Q2 of 2024</p>
	<p>Existing split air conditioning systems in Maberly Hall consists of wall mounted condensing units</p>	<p>Energy performance of proposed split unit heat</p>	<p>Public Works Manager</p>	<p>2025</p>

	<p>by Comfort Aire (model# AHMC24AS) and Heat Controller Inc. wall mounted evaporators at the interior. The systems use R22 refrigerant which is being phased out.</p> <p>It is recommended that these units be replaced with new split (heat pump) units with compliant refrigerant and that are also more energy efficient.</p>	pumps is estimated to be at least 50% better than split units installed in 2010.		
	Existing lighting in Maberly Hall is fluorescent throughout the first floor and incandescent in the basement and has been upgraded to high efficiency lighting.	Approximately 40-50% savings of lighting electricity demand and consumption.	Public Works Manager	Completed in 2023
	Existing lighting in Burgess Garage consists of fluorescent lamps and it is recommended to upgrade these lamps to LED.	The estimated energy and cost savings are approximately 5,000 kWh and \$600.00 respectively.	Public Works Manager	Completed in Q2 of 2024
	Existing lighting in Burgess Hall Garage consists of T12 and T8 fluorescent lamps and it is recommended to upgrade these lamps to LED.	The estimated energy and cost savings are approximately 800 kWh and \$150.00 respectively.	Public Works Manager	Completed in Q2 of 2024
	Existing exterior lighting in Burgess Hall is HID (southeast) and it is recommended to replace with LED and install new astronomical timer to control on/off times.	Approximately 60-70% savings of electrical lighting demand and consumption depending on existing wattages.	Public Works Manager	2025
	Existing lighting in the South Sherbrooke Fire Hall consists of fluorescent lamps with 20xT8, 32W quad lamps in the Apparatus Bay; 3xT8 lamps in the Communications Office; 32xT8, 32W double lamps in the Mezzanine, 1xT8, 32W	If LED lights are proposed as part of the investigation, the estimated energy and cost savings are	Fire Chief/Public Works Manager	2024-2029

	<p>triple are installed in the Meeting Room, Chief's Office and Captain's Office. There are also exit signs.</p> <p>Though this lighting is listed in good condition, it is older technology, and it is suggested that a comprehensive lighting retrofit with lighting controls be investigated in the long term</p>	approximately 1400 kWh and \$270.00 respectively.		
Objectives	Action	Energy Management Benefit Estimate	Action Owner	Target Completion Date
Procurement	Integrate energy efficiency knowledge and practices into requirements of suppliers	Ensures life cycle costing and energy efficiency are incorporated into Township acquisitions and contracts.	Treasurer	2026
Education & Awareness	Train staff on energy and GHG implications of activities	Reduce energy consumption, waste	Planner	2026
Objectives	Action	Energy Management Benefit Estimate	Action Owner	Target Completion Date
Emissions Reduction Study	Develop a feasibility study for a near or net zero emissions retrofit for the Municipal Office/Garage. As a first step investigate eligibility requirements for grant funding for the study including the Green Municipal Fund. Options for renewable energy are usually a necessity of net zero emission studies.	Since this building uses more than half the energy and emits more than half the GHGs of Township's portfolio, the study and retrofit would provide significant benefits.	Public Works Manager	2024-2029

7 EVALUATION

The municipality intends for the CDM and Climate Action Plan to be living documents which senior management will review once a year and will report on annually to Council. These documents will follow the Plan, Do, Check and Act cycle which is an iterative process to develop and continuously improve on solution(s); in the case of the CDM Plan, these would be energy management solutions.

As well as the above technical measures, the municipality also committed to a range of measures designed to change the organizational and behavioral patterns within the municipality which will be assessed annually.

Based on the above measures and funding available for end-of-life equipment, it is suggested the Township target a 5-10% reduction in energy consumption and emissions in the five-year term of the CDM Plan. If the net zero retrofit of the Municipal Office/Garage is feasible then a long-term goal could be 60% in seven to nine years.

APPENDIX A - Energy Consumption and Greenhouse Gas (GHG) Emissions for 2023

These figures were entered by the Township into Energy Star's Portfolio Manager from utility bills and exported into the below table.

Table 4. Energy Consumption and Greenhouse Gas (GHG) Emissions for 2023

Property Name	Year Ending	Address 1	Postal Code	Property GFA Self-Reported (ft ²)	Weekly Operating Hours	Electricity. Grid Purchase (kWh)	Natural Gas (therms)	Propane (kBtu)	Total GHG Emissions (Metric Tons CO ₂ e)
South Sherbrooke Fire Station	2023-12-31	22110 Hwy 7	K0H 2B0	8,599	10.0	10,239	0	177,832	11.8
Burgess Garage and Hall	2023-12-31	4174 Narrows Lock Road	K7H 3C5	3,845	30.0	25,409	2,020	0	11.4
Maberly Township Hall	2023-12-31	180 Maberly Elphin Road	K0H 2B0	2,726	20.0	7,652	0	93,160	6.2
Municipal Office Bathurst Garage	2023-12-31	217 Harper Road	K7H 3C6	13,389	40.0	61,970	5,549	0	31.2

APPENDIX B - COMPLIANCE WITH O. Reg 25/23

In 2014 Tay Valley Township adopted an Energy Conservation and Demand Management Plan in compliance with Ontario Regulation 397/11 – *Energy Conservation and Demand Management Plans* (O. Reg. 397/11). The regulation also required municipalities and other public sector groups to report annually on energy use and greenhouse gas (GHG) emissions for buildings and facilities in which the agency conducts its operations, that are heated or cooled or are related to the treatment or pumping of water or sewage. See table (which is an excerpt from the regulation) on the following page for details of the required facilities to be reported.

O. Reg. 397/11 was replaced with Ontario Regulation 507/18 – *Broader Public Sector: Energy Reporting and Conservation and Demand Management Plans* (O. Reg. 507/18) on January 1, 2019. The new regulation required the Municipality to develop and publish a five-year update to the Municipality's Energy Plan by July 1, 2019. The Municipality submitted a draft CDM Plan to meet the 2019 deadline. The Ministry of Energy, Northern Development and Mines gave the Township an extension to fully update the CDM Plan once the Tay Valley Climate Action Plan (funded by the Federation of Canadian Municipalities) was complete.

O. Reg. 507/18 has since been revoked and replaced with O. Reg. 25/23. The major amendments to 507/18 that are included in the current regulation are:⁴

1. **Reporting and Tracking:** Moving reporting from a custom-made platform to ENERGY STAR Portfolio Manager.
2. **Reporting Period:** Reporting of 2021 data in 2023, 2022 and 2023 in 2024 and one year (2024) of data in 2025.
3. **Prescriptive Elements:** Updates to the title of form and removal of specific units of measurement to allow BPS organizations to use units they want to report as long it is an industry standard.

Tay Valley complies with O. Reg. 25/23 as senior authority (Council) has adopted the CDM Plan and the Plan has been placed on the Township website and a hard copy is available at the office.

⁴ <https://ero.ontario.ca/notice/019-6168>

Table 5. Required Facilities for Reporting (O. Reg. 25/23)

Item	Type of public agency	Operation
1.	Municipality	<ol style="list-style-type: none"> 1. Administrative offices and related facilities, including municipal council chambers. 2. Public libraries. 3. Cultural facilities, indoor recreational facilities and community centres, including art galleries, performing art facilities, auditoriums, indoor sports arenas, indoor ice rinks, indoor swimming pools, gyms and indoor courts for playing tennis, basketball or other sports. 4. Ambulance stations and associated offices and facilities. 5. Fire stations and associated offices and facilities. 6. Police stations and associated offices and facilities. 7. Storage facilities where equipment or vehicles are maintained, repaired or stored. 8. Buildings or facilities related to the treatment of water or sewage. 9. Parking garages.
2.	Municipal service board	<ol style="list-style-type: none"> 1. Buildings or facilities related to the treatment of water or sewage.
3.	Post-secondary educational institution	<ol style="list-style-type: none"> 1. Administrative offices and related facilities. 2. Classrooms and related facilities. 3. Laboratories. 4. Student residences that have more than three storeys or a building area of more than 600 square metres. 5. Student recreational facilities and athletic facilities. 6. Libraries. 7. Parking garages.
4.	School board	<ol style="list-style-type: none"> 1. Schools. 2. Administrative offices and related facilities. 3. Parking garages.
5.	Public hospital	<ol style="list-style-type: none"> 1. Facilities used for hospital purposes. 2. Administrative offices and related facilities.