



DRAFT

IMPACT STATEMENTS

Impact ID	Climate Category	Climatic Threat	Impact Statement
1	Temperature	Increased Annual Temperature	Extended shoulder season (spring and fall) resulting in an extended maintenance seasons and potential changes in timing of staff hiring, type of staff hired (students), scheduling and work restrictions.
2	Temperature	Increased Annual Temperature	Increased reproduction rates and range of vectors (e.g. West Nile Virus, Lyme Disease) resulting in an increased risk of exposure to vector-borne diseases for municipal outdoor workers.
3	Temperature	Increased Annual Temperature	Extended growing seasons resulting in the potential for an increase presence and impacts from invasive species within municipally owned property.
4	Temperature	Increased Annual Temperature	Changes in timing of spring melt resulting in surcharge and runoff from rapid snowmelts resulting in the potential of overburdening of the municipal stormwater system.
5	Temperature	Increased Annual Temperature	Increased opportunities for the community to participate in active transportation (i.e. cycling, walking, biking) and outdoor recreation.
6	Temperature	Increased Summer Temperatures	Increased number of dry periods resulting in increased irrigation required for parks, gardens, and sport fields.
7	Temperature	Increased Summer Temperature	Increased risk of bacteria growth in Lake Huron from increase surface water temperatures resulting in more beach closures and potential revenue loss from Port Blake.
8	Temperature	Increased Summer Temperatures	Increased summer energy usage for municipally-owned facilities leading to increased utility costs for the municipality.
9	Temperature	Increased Summer Temperatures	Increase in landfill odors due to an increase in decomposition rate leading to an increase in complaints related to odors within the vicinity of the landfill.
10	Temperature	Increased Summer Temperatures	Increase in anaerobic activity resulting in a decrease in dissolved oxygen (DO) leading to disruption to the treatment process, potentially requiring an increased in existing treatment or alternative process(es).
11	Temperature	Increase in Very Hot Days (over 30°C)	Reduced air quality that may cause heat stress or respiratory illnesses leading to outdoor programming requiring alternative locations.
12	Temperature	Increase in Very Hot Days (over 30°C)	Reduced air quality that may cause heat stress or respiratory illnesses resulting in increased health and safety risk and demand for municipal outdoor workers to have appropriate working hours, cooling aids, personal protective gear and spaces for relief.
13	Temperature	Increase in Very Hot Days (over 30°C)	Potential for periods of shortened windows to work outside, reduced productivity and extended periods that outdoor work cannot be completed.
14	Temperature	Increase in Very Hot Days (over 30°C)	Increased damage to hard surfaces (roads, sidewalks) resulting in an increase in request for service and staff time to repair/replace, increased costs and integration into asset management planning.
15	Temperature	Increase in Very Hot Days (over 30°C)	Reduced air quality that may cause heat stress or respiratory illnesses resulting in increased health and safety risk to the public, especially vulnerable populations.

Impact ID	Climate Category	Climatic Threat	Impact Statement
16	Temperature	Increase in Very Hot Days (over 30°C)	Reduced air quality that may cause heat street or respiratory illnesses lead to an increased in request for service and staff time to accommodate demand for outdoor cooling facilities (pools, tree covered areas, splash pads) and indoor facilities.
17	Temperature	Increase in Very Hot Days (over 30°C)	Increased temperature within urban areas where built infrastructure is most prominent resulting in heat being trapped causing an increase in temperature within urban boundaries.
18	Temperature	Increase in Very Hot Days (over 30°C)	Increased in incidents of violent crimes resulting in disruption to the entire municipality and an increase in demand for emergency services.
19	Temperature	Increase in Very Hot Days (over 30°C)	Increased demand for pool and splash pad, resulting in disrupted disinfectant practices during a time of high chemical dissipation and limited maintenance opportunities during peak usage.
20	Temperature	Increase in Very Hot Days (over 30°C)	Increased stress on trees resulting in an increase in water demand and staff time to ensure the health and success of trees, or, removal of hazard trees located on municipally-owned property not able to survive.
21	Temperature	Increase in Very Hot Days (over 30°C)	Increased bacteria growth and dissipation of chlorine within municipally-owned water storage facilities resulting in increased staff monitoring and changes to the amount/type of chemicals (chlorine) required within the system to ensure drinking water standards are adhered to.
22	Temperature	Increase in Very Hot Days (over 30°C)	Reduced air quality that may cause heat stress or respiratory illnesses resulting in increased health and safety risk to municipal volunteer fire fighters working during periods of very hot days requiring appropriate working hours, cooling aids and relief mechanisms.
23	Temperature	Increase in Very Hot Days (over 30°C)	Increased energy demand during ice making in August, resulting in an increase demand for energy, potential failure from equipment overworking, leading to an overall decrease life cycle of equipment.
24	Temperature	Increase in Winter Temperatures	Increased survival rates for pests and insects, leading to impacts to tree and vegetation and potential loss of natural assets throughout municipally-owned property.
25	Temperature	Increase in Winter Temperatures	Decrease in duration of pond freeze-over (sewage lagoon) during the winter season resulting in t potential to discharge treated effluent year-round
26	Temperature	Increase in Winter Temperature	Changes in timing of winter melt resulting in surcharge and runoff from rapid snowmelts resulting in an overburdening of the stormwater system.
27	Temperature	Increase in Winter Temperature	Decreased winter heating costs for municipally-owned facilities leading to decreased costs to the municipality during the winter months.
28	Temperature	Increased in Freeze-thaw cycles in January and February	Increased stress on trees and natural areas resulting in an increase in request for service and staff time to monitor and remove hazard trees on municipally-owned property.

Impact ID	Climate Category	Climatic Threat	Impact Statement
29	Temperature	Increased in Freeze-thaw cycles in January and February	Increased movement causing potential damage to municipal infrastructure (buildings, underground services, roads, sidewalks, cemetery) resulting in increase in request for service and staff time to monitoring and repair/replace, increased costs and integration into asset management planning.
30	Precipitation	Increased in Heavy Precipitation Days (20mm)	Inundated municipal outdoor facilities (sports fields, parks, natural areas and trails, cemetery) leading to temporary disruption in using these spaces or increase in demand for alternative spaces, where applicable.
31	Precipitation	Increased Annual Precipitation	Increased areas with standing water resulting in greater risk of areas supporting reproduction of mosquitos with the potential to increase the exposure risk of West Nile Virus.
32	Precipitation	Increased Spring Precipitation	Leading to inundated municipal outdoor facilities (sports fields, parks, natural areas and trails, cemetery) and disruptions preventing municipal staff from maintaining these spaces in the spring season.
33	Precipitation	Increased Spring Precipitation	Leading to inundated Port Blake day-use area preventing municipal staff from maintaining the site resulting in a delay in public usage of the park and potential lost revenues.
34	Precipitation	Increased Spring Precipitation	Leading to increased sediment and debris on municipally-owned roadways from vehicular traffic and saturated conditions resulting in an increased service request for street cleaning services.
35	Precipitation	Increased Winter Precipitation	Increased use of salt and/or sand on roadways, sidewalks and in parking lots resulting in increase in staff time, increased corrosion to equipment and facilities, and greater impact on water quality within the municipality.
36	Precipitation	Increased Winter Precipitation	Increased rainfall and melting during periods when the ground is frozen and saturated causing an increased risk of overland flooding leading to damage to municipal infrastructure.
37	Precipitation	Increased Winter Precipitation	Increased outdoor maintenance from precipitation falling as snow or rain requiring more staff time to monitor and operate, equipment requirements and cost to the municipality.
38	Extreme Weather Event	Increased frequency and duration of heatwaves	Increased health and safety risk to vulnerable populations resulting in an increase in service requests, access to cooling facility resulting in increased request for service and staff time and coordination, potentially outside of regular working hours.
39	Extreme Weather Event	Increased frequency and duration of heatwaves	Shift in timing and scheduling of outdoor seasonal programming (sports, events, camps) to avoid peak summer temperatures and heatwaves resulting in the potential for an increase in extended maintenance periods.
40	Extreme Weather Event	Heavy localized flooding events	Inundation of outdoor municipal facilities (sports fields, parks, natural areas and trails, cemetery) leading to temporary disruption of facilities and an increased cost and staff time to repair damages or address stormwater deficiencies.

Impact ID	Climate Category	Climatic Threat	Impact Statement
41	Extreme Weather Event	Heavy localized flooding events	Overloading of older sanitary sewers (in particular, where inflow and infiltration of stormwater/groundwater into sanitary sewers), resulting in the potential for untreated sewage overflow by-passing secondary treatment allowing contaminants and infectious organisms entering into the receiving waterbody.
42	Extreme Weather Event	Heavy localized flooding events	Overwhelming of sanitary sewers resulting in the potential back up of sewage into basements, particularly in low lying areas.
43	Extreme Weather Event	Heavy localized flooding events	Overflow by-pass resulting in an increase in call outs to Municipal staff due to emergency alarms, service calls and mandatory reporting to agencies (i.e. Ministry of Environment, Conservation and Parks).
44	Extreme Weather Event	Heavy localized flooding events	Increased surface runoff resulting in an increased risk of pollution from the landscape entering local waterbodies.
45	Extreme Weather Event	Heavy localized flooding events	Increase in sediment and debris within municipally-owned drains and culverts, requiring an increase in maintenance scheduling and monitoring.
46	Extreme Weather Event	Heavy localized flooding events	Increase in erosion rates and sediment release within riparian areas and unstable transition to low lying areas, causing an increase in bank destabilization, loss of habitat and impact on water quality.
47	Extreme Weather Event	Heavy localized flooding events	Increased stress on bridges/culverts, potential for road washouts, erosion and transportation disruptions requiring an increase in emergency service requests and staff time to monitor, repair/replace damages, financial cost to the municipality and increased management required during the response period.
48	Extreme Weather Event	Heavy localized flooding events	Increased damage to private property due to flooding resulting in an increase in number of residents contacting the municipality, specifically directed to the Building Department requesting information on flooding and assistance to address the situation.
49	Extreme Weather Event	Heavy localized flooding events	Increase in flooding in areas that may lead to an increased risk of public exposure to potential illnesses and pathogens (including water-borne illnesses, mold).
50	Extreme Weather Event	Increase in freezing rain events	Increased hazardous road and walking conditions resulting in an increase need for monitoring and salt/sand applications applied by municipal staff.
51	Extreme Weather Event	Increase in frequency of extreme weather events	Increased extensive damaged to private property resulting in an increase in requests for permits (with the potential for quick turnarounds requested) resulting in an increase in staff time to consult and prepare required documentation to issue permits.

Impact ID	Climate Category	Climatic Threat	Impact Statement
52	Extreme Weather Event	Increase in frequency of extreme weather events	Increased need for 24/7 (including after-hour services) for public to access municipal staff regarding occurrences requiring immediate attention, increase in requests for service, coordination and communications to the general public.
53	Extreme Weather Event	Increase in frequency of extreme weather events	Increased number of displaced residents from their homes due to extreme weather events, leading to an increase usage of the Emergency Operations Centre (Town Hall), request for service, coordination and communications from municipal staff.
54	Extreme Weather Event	Increase in frequency of extreme weather events	Increased demand for essential services and disaster recovery costs resulting in an increase in staff time and financial cost to the municipality.
55	Extreme Weather Event	Increase in frequency of extreme weather events	Increased damage and/or decreased service life of municipal infrastructure (buildings, underground services, roads, bridges/culverts), public spaces requiring the potential closure of municipal facilities, increase request for service, staff time to repair/replace infrastructure and financial cost to the municipality.
56	Extreme Weather Event	Increase in frequency of extreme weather events	Increase in occurrences of power outages, transportation disruptions, and public health and safety situations resulting in an increased demand for emergency services, communications, coordination and resources.
57	Extreme Weather Event	Increase in frequency of extreme weather events	Increased damage to urban trees, parks, and trails resulting in closures, increased request for service and staff time and cost to the municipality to identify and remove hazard trees.
58	Extreme Weather Event	Increase in frequency of extreme weather events	Increased power outages and electrical surges, resulting in service disruptions for the entire municipality.
59	Extreme Weather Event	Increase in frequency of extreme weather events	Increased power outages and electrical surges, resulting in the inability for municipal staff to utilize phones and computers, process work orders, provide communications to the entire municipality and access information for coordinated effort during extreme weather events.
60	Extreme Weather Event	Increase in frequency of extreme weather events	Increased power outages and electrical surges, resulting in back up power (short and long term) required for critical infrastructure including water and sewage pumping stations and sewage lagoons.

Impact ID	Climate Category	Climatic Threat	Impact Statement
61	Extreme Weather Event	Increase in frequency of extreme weather events	Increased liability, public and health and safety hazards and risks, private property damage, dangerous conditions that may impact the entire municipality.
62	Extreme Weather Event	Increase in frequency of extreme weather events	Disruption to regional food distribution system resulting in potential food shortages impacting the entire municipality.
63	Extreme Weather Event	Increase in frequency of extreme weather events	Increased power outages and electrical surges, resulting in potential risk to the public associated with heating/cooling buildings and cooking meals.
64	Extreme Weather Event	Increase in frequency of extreme weather events	Increase in repairs/replacements addressed under tender bids during times of overload to municipal staff resulting in increased cost and project management time to the municipality.
65	Extreme Weather Event	Increased frequency and duration of drought	Reduced quality of outdoor municipal facilities (sports fields, parks, natural areas and trails, cemetery) requiring an increase in municipal water usage, request for service, and maintenance and monitoring of the quality of spaces.
66	Extreme Weather Event	Increased frequency and duration of drought	Reduced quality of municipal and private property lawn/gardens, and drought in-tolerant trees and vegetation resulting in an increase in demand for municipal water.
67	Extreme Weather Event	Increased frequency and duration of drought	Reduced quality of municipal lawn/gardens, and drought in-tolerant trees and vegetation requiring an increase in effort to maintain and remove distressed species located on municipal property.
68	Extreme Weather Event	Increased frequency and duration of drought	Increased risk of fire during dry conditions resulting in an increase in fire related calls and increase in the total number of calls for fire department during dry periods.
69	Extreme Weather Event	Increased frequency and duration of drought	Increased risk of fire at the landfill during dry conditions resulting in an increased risk of exposure to landfill operations employees and increase in fire related calls during dry periods.
70	Extreme Weather Event	Increased frequency of extreme cold events	Increased risk of deep freeze to municipal underground water service causing breakage or freezing resulting in an increased immediate request for service, staff time to repair/replace the damaged services and cost to the municipality.

Impact ID	Climate Category	Climatic Threat	Impact Statement
71	Extreme Weather Event	Increased frequency of extreme cold events	Increased risk of deep freeze to municipal infrastructure causing deficiencies resulting in an increased immediate request for service, staff time to repair/replace the damaged infrastructure and cost to the municipality.
72	Extreme Weather Event	Increased frequency of extreme cold events	Increase risk of deep freezing of private property underground water service breakage or freezing resulting in an increase in repair/replacement of the damaged services resulting in an increase in permits/agreements required for connection.
73	Extreme Weather Event	Increased frequency of extreme cold events	Increased health and safety risk to vulnerable (thermoregulation, frostbite) populations resulting in an increase in the need for community cold alerts, service requests, and access to warming facility resulting in increased request for service and staff time and coordination, potentially outside of regular working hours.
74	Extreme Weather Event	Increased frequency of extreme cold events	Increased health and safety risk (thermoregulation, frostbite) and demand for municipal outdoor workers to have appropriate working hours, warming aids, personal protective gear and spaces for relief.

DRAFT