REPORT

Council

Meeting Date: August 13, 2024

FROM: CAO's Office

DATE: August 6, 2024

SUBJECT: **July 2024 Rain Event – Oakville Impact and Update**

LOCATION:
WARD: Town-wide

RECOMMENDATION:

That the information report - July 2024 Rain Event – Oakville Impact and Update be received.

KEY FACTS:

The following are key points for consideration with respect to this report:

- Oakville experienced a rain event on July 15 and 16, 2024.
- On average, the event on July 15 was equivalent to a 2 to 5-year event with the July 16 event being less intense.
- However, in select areas of the town, the July 16 event was equivalent to a 10 to 25-year storm (area of QEPCCC) and a 100-year storm (area of Oakville Southwest Wastewater Treatment Plant (WWTP).
- Higher than normal rates of stormwater runoff were observed during these events due to high amounts of rainfall occurring for the five days preceding July 15 which caused wet to saturated soil conditions on pervious surfaces.
- The storm damaged some site-specific town assets and interrupted services. Recovery efforts are on-going.
- Town staff continues to maintain and enhance the town's stormwater network and is developing a long-term capital plan and associated financial plan to mitigate flooding risks and increase climate resiliency.
- Flooding of private property can be caused by various factors. Currently the town coordinates a response with Halton Region for basement flooding calls.

BACKGROUND:

Oakville and Halton Region experienced a severe rain event in localized areas.

On Monday July 15, and Tuesday July 16, 2024, severe thunderstorms occurred in Halton Region, with Oakville receiving varied levels of rainfall. The heaviest storm activity occurred in South Oakville. Only July 16, the Queen Elizabeth Park Community and Cultural Centre area received the equivalent of a 10 to 25-year event and the Halton Region Southwest WWTP, near Coronation Park, received the equivalent of a 100-year event. On average, the town experienced a 2 to 5-year event on July 15 and a less than 2-year event on July 16.

The rain intensity in Engineering terms, based on rain gauges is shown below:

Station ID	Event date	Total Average Rainfall (mm)	Peak 30-min Intensity (mm/hr)	IDF Correlation 30-min	Peak 1hr Intensity (mm/hr)	IDF Correlation 60-min	Peak 2hr Intensity (mm/hr)	IDF Correlation 120-min
Rest of Oakville (9 locations)	16-Jul	42	34	< 2 yr	24	< 2 yr	15	2 - 5 yr
	15-Jul	40	41	2 - 5 yr	26	2 - 5 yr	15	2 - 5 yr
Queen Elizabeth Park CC	16-Jul	QEPCC reported 21 mm of Rain on July 16th, Only events greater or equal to 25mm were analyzed						
	15-Jul	53	78	10 - 25 yr	40	10 - 25 yr	22	5 - 10 yr
Halton SW Wastwater TP	16-Jul	35	34.0	< 2 yr	24.6	< 2 yr	14	< 2 yr
	15-Jul	60	100.4	> 100 yr	51.6	25 - 50 yr	27	25 - 50 yr

*IDF = Intensity-Duration-Frequency curves are graphical tools that describe the likelihood of a range of extreme rainfall events.

Due to consecutive rainfall on the five (5) days preceding Monday July 15, the ground was already saturated which resulted in heavier than normal stormwater runoff on July 15/16.

The town has a stormwater network in place that we continue to maintain and enhance.

The town has had a stormwater network in place for over 50 years and is in place to help protect public safety, reduce flood risks, control erosion and maintain water quality in local natural waterways. Design standards are applied by the town to generally accommodate major system flows for a 100-year rainfall event. The town manages stormwater runoff from rainfall events and snowmelt through a network of various stormwater infrastructure and natural assets that the Town inspects and maintains to ensure they are functioning appropriately. The town is responsible for several types of stormwater infrastructure ranging from minor system (e.g. storm sewers and ditches) to major system drainage (e.g. overland flow on roads, creeks), stormwater management ponds and shoreline embankments.

Staff are developing a Rainwater Management Financial Plan (RWMP) to deliver a holistic long-term plan with supporting finances to improve resiliency against climate change and better protect our stormwater infrastructure and natural assets.

According to the Government of Canada's April 2019 Changing Climate Report, Canada is experiencing warming at twice the rate of the rest of the world, with Northern Canada heating up at almost three times the global average. In Southern Ontario, we are experiencing more intense and more frequent rainfall than ever.

The town has completed several climate change flood risk related studies, such as the Stormwater Master Plan, several riverine flood studies, and the Harbour Flood Assessment Study. These studies have identified approximately $350 million to improve the town's stormwater infrastructure and to reduce the risk of flooding from these more intense storm events.

The Rainwater Management Financial Plan is a long-term plan to improve resiliency to climate change and protect our stormwater infrastructure and natural assets. The multi-phase RWMP will deliver a financing plan that provides a comprehensive approach to plan and implement stormwater-related infrastructure renewal and improvement projects into the future. The RWMP has developed a framework to prioritize the projects from various study recommendations that considers asset management principles, cost/benefit, risk and likelihood of service impact and alignment/coordination with other projects so that projects in areas with the greatest risk and that provide the most benefit are prioritized first.

Work on this financing plan is well underway, with the first Council Workshop held on June 11, 2024, which provided an update on the study and the workplan.

The purpose of this report is to provide an update on:

- **Impact of the recent storm events**
- **Town's recovery efforts**
- **Plans to mitigate future flood risk and climate change**
- **Flooding response and communication**

COMMENT/OPTIONS:

Service Oakville and the Region of Halton (311) received a total of 339 calls related to the storm ranging from public right-of-way/property damage to private residential flooding.

ServiceOakville assigned service requests to the responsible departments. Works Operations received 27% of the requests that were related to public right-of-way and 21% related to residential flooding (non-sanitary sewer related), Parks Operations

received 43% related to trees, trail and park flooding and harbours, and Building Services received 10% that were construction related.

As of July 22, 2024, the breakdown of calls received are summarized in Table 1 below:

	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	Ward 7	Total Municipality
Halton Region Reported	21	26	6	3	9	12	3	80
ServiceOakville Salesforce Service Requests	46	64	62	29	23	25	10	259

The recent storm combined with the cumulative impact of the previous rainfalls, caused damage to some town assets and resulted in temporary interruptions to some services. Although most issues have been resolved, recovery efforts are on-going in some cases.

In addition to the urban flooding resulting from the rainfall, the town experienced significant flooding in the riverine due to high water levels and extremely high velocities of water. A summary of the impacts is identified below:

Parks and Harbours

- **Sixteen Mile Creek Harbour:** Significantly impacted with several docks and boats dislodged from the Navy Flats due to high waters, extreme current and debris flows. Twenty-two boats and 600 feet of dock were dislodged, and a number of boats and a significant amount of dockage were washed out into Lake Ontario. There were no injuries related to the event. Harbours and Parks staff worked diligently with Halton Marine Police and OMSAR volunteers to secure boats, harbour infrastructure and the immediate area. Docks and infrastructure at the various Clubs within Oakville harbour have been returned to an operational and safe state although full recovery and repair efforts are expected to continue over the coming weeks.
- **Trafalgar Lawn Cemetery:** a culvert collapsed which resulted in damage to the northern expansion area access road. Repair efforts to the access road are ongoing at the time of this report.
- **Park Trails:** a number of trails sustained considerable damage town-wide particularly during the July 16 rain event. The Heritage Trail (Inner Valley trail) was damaged south of Lions Valley Park; the entire N/S trail within Lions Valley Park was washed out and required replacement; the playground within Lions Valley Park is closed as the surface of the playground is a combination of silt/mud and debris from the overtopped 16 Mile Creek; trail damage

occurred around bridges that are within the 16 Mile valley north of Glen Abbey golf course; erosion occurred on most Town trails that have slopes, including Glen Oak Creek, Taplow Creek, McCraney Creek, Glen Abbey Trail, Fourteen Mile Creek Trail. Staff have repaired a number of washouts on trails however work continues.

- **Town's Sports Fields and Parks:** were temporarily closed due to ground saturation, flooding, and in some cases fallen tree branches: Coronation Park Volleyball court, Petro Canada Park, and Lions Valley Park. These sites have re-opened although some areas continue to be impacted, such as portions of the Lions Valley Park trail which are still undergoing repair.

Town Facilities

- Staff addressed flooding incidents at Town Hall, River Oaks CC, Central Library, Queen Elizabeth Park CC and Cultural Centre and Sir John Colborne parking lot. Additionally, the upper mezzanine area of Joshua Creek Arena was also impacted and have since been repaired.

Roads and Works

- **Ditches overflowing:** At peak rainfall intensity, the ditch lines were running up to maximum capacity and in some areas (such as south Oakville) ditch lines were overflowing. However, these areas drained fairly quickly after the rain event.
- **Lower Baseline Road (between Fourth Line and Regional Rd. 25):** On the boundary road with the Town of Milton, 2252 Lower Baseline and 1670 Lower Baseline required installation of a road closure (local access only permitted) and lane closure in isolated locations. A consultant was engaged to complete a geotechnical investigation and slope stability analysis with the design work and site investigation expected to continue over the next month or so. The preliminary recommendations are anticipated to be received near the end of August, with a tender for repair work in early October.
- **Sixteen Mile Creek Retaining Wall:** The storm has impacted a portion of the gabion erosion protection wall along the creek near the Speers Road bridge and will need minor repairs. The majority of the structure is still intact and does not present a safety concern.
- **Road closures:** Some road lanes were temporarily closed due to water ponding. The worst location was Royal Windsor, and Upper Middle/9th Line. Staff worked with Halton Region Police Services (HRPS) to slow traffic through these areas and impacted roadways drained within 30-60 minutes after the rain subsided.

Staff continue to assess infrastructure stability and address immediate safety concerns. Through these assessments staff will plan rehabilitation and replacement as part of the 2025 budget process.

Different authorities respond to different flooding impacts.

There are several types of flooding that are controlled through various infrastructure, natural assets and management techniques that work together to provide overall protection to the community. Authority over the types of infrastructure is shared between the Town, the Region, Conservation Authorities, and the International Joint Commission with all four playing a key role.

- Riverine flooding concerns are shared with the Conservation Authority who regulate the creek floodplains.
- Urban flooding is managed through the minor (storm sewer pipes) and major (overland flow route) storm drainage systems (including stormwater ponds) which are the responsibility of the town.
- Basement flooding related to surcharging (back up) of sanitary sewers is the responsibility of Halton Region.
- The International Joint Commission regulates the outflows of the Great Lakes regarding upstream/downstream water levels.

Town response during a severe storm focuses on the safe operations of the town's Right-of-way and maintaining the function of our stormwater network.

The town has a stormwater network, and it operates effectively with typical and moderate rainfall and snow melt events. Heavy rainfall events combined with seasonal elements (leaves or snowbanks) can pose challenges to the network which can result in localized flooding.

The town manages stormwater runoff flows by ensuring there is a range of measures in place to decrease the risk of flooding, reduce pollution and respond to issues during storm events. Town staff perform several activities to ensure the stormwater network and town assets operate as planned, including pre-event monitoring, inspection and maintenance, responding to ServiceOakville calls during an event, providing support and remedy to emergency issues where possible, and post event follow-up and review. Examples of activities include clearing debris from priority grates/inlets in advance and during an event, securing harbours, making safe areas where flooding is creating safety concerns (parks, facilities, roads), updating the town's website, etc.

What has the town and Halton Region done to address flooding risks?

The Town has completed several studies and invested in capital projects to improve overall flood resiliency with a focus on town assets. Since the 2017 storm, improvements have been made to natural infrastructure including naturalizing channels, shoreline improvements, and erosion restoration. Further, in the town's 10-year forecast, there are plans to replace storm pipes, increase flow capacity by implementing inlet control devices, and specific area drainage, creek, and harbour

improvements. Details of work to date and planned work to mitigate flood risks with the lens of green infrastructure first, are summarized in Appendix A.

To increase the resiliency of the main wastewater collection system, the Region has introduced a multi-year Basement Flooding Mitigation Program which includes various capital upgrades to help reduce stormwater infiltration and reduce the risk of future basement flooding. The improvements include rehabilitation of existing sanitary sewer mains, laterals, and maintenance holes. Town staff, and staff from other Halton municipalities, meet with the Region quarterly to co-ordinate on these initiatives with any planned local infrastructure improvements.

What should a resident do when they are flooded?

Residents can call ServiceOakville if there is flooding in the public right-of-way or impacts to public infrastructure. If a resident's call is related to basement flooding, ServiceOakville connects them to Halton Region. ServiceOakville calls are triaged based on severity of flooding and threats to public safety, while the response time is dependent on volume of calls, and urgency of the issue. Additional information is provided in Appendix B.

What supports are available for basement flooding?

Halton Region offers a Ex-gratia grant program where $1,000 is available to property owners to assist with flood-related costs where Halton Region Public Works staff have investigated and determined that:

- a blockage occurred on the municipal side of the wastewater system; or
- the wastewater backup was the result of a sewer surcharge.

In addition, Halton Region's Basement Flooding Prevention Subsidy Program assists property owners in making home improvements that can reduce the risk of flooding from sewer backup. Property owners are provided with subsidies and access to qualified, licensed contractors, making it easier and more affordable to get necessary prevention work completed. The subsidies include:

1. **Downspout Disconnection:** 100% of all eligible costs to disconnect downspouts from the weeping tile, up to a maximum of $500.
2. **Weeping Tile Disconnection and Sump Pump Installation:** 100% of the combined eligible costs to disconnect weeping tiles and install a sump pump, up to a maximum of $5,000.
3. **Backwater Valve Installation:** 50% of the eligible costs to install a backwater valve inside the home, up to a maximum of $675.
4. **Sewer Lateral (pipe) Lining and Repair:** 50% of the eligible costs to repair or line the sewer lateral (pipe), up to a maximum of $2,000

The Town of Oakville, through the Rainwater Management Financial Plan, is exploring opportunities for stormwater fee rebates and credits for property owners who implement measures that would provide flood or erosion protection and/or quality treatments. Public consultation is planned in the Fall of 2024 for the fee / credit development.

The town is updating its flood-related web content and has a social media campaign on flooding with useful resources, such as who to contact, prevention tips, supports available, FAQs, etc.

In addition, the Town is also investing significant dollars partnering with Intact Centre for Climate adaptation at the University of Waterloo to create a customized flood preparedness education program for property owners in Oakville with their properties near or in the flood plain.

CONSIDERATIONS:

(A) PUBLIC

Information and educational material related to stormwater management will be updated to assist members of the public with their questions on how to improve their property's resiliency and adapt to the impacts of climate change.

(B) FINANCIAL

There are no direct financial implications resulting from this report.

(C) IMPACT ON OTHER DEPARTMENTS & USERS

Asset Management, Transportation and Engineering, Parks and Open Space, Roads and Works, Planning and Development, and Communications and Customer Experience were consulted in the preparation of this report.

(D) CORPORATE STRATEGIC GOALS

This report addresses the corporate strategic goal(s) to:

- Environment – Effective management of the overall rainwater related infrastructure network helps to protect Oakville residents while preserving our natural environment and increase our resiliency against climate change.

(E) CLIMATE CHANGE/ACTION

Severe storms can cause property damage and have harmful effects on the environment. Appropriate management of the town's stormwater assets and providing resources to the public regarding flooding will support the town's efforts to adapt to the impacts from more frequent and severe rainstorms resulting from climate change**.**

APPENDICES:

Appendix A: ServiceOakville Flood Calls Triage Protocol
Appendix B: Flood Mitigation Works Completed and Planned

Prepared and Recommended by:
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Appendix A - FLOOD MITIGATION WORKS COMPLETED (2018 TO PRESENT) AND PLANNED (2025 TO 2034)

STORMWATER/FLOOD STUDIES COMPLETED AND IN PROGRESS	
Flood Prioritization Study	2008
Storm Sewer Master Plan Phase 1	2015
Coronation Park Drainage Improvements Class EA Study	2016
Stormwater Master Plan	2019
Munn's Creek Flood Mitigation Study	2019
Sheldon Creek Flood Mitigation Study	2021
Harbours Risk and Flood Assessment study	2021
Coronation Park Shoreline Assessment Restoration and Protection Study	2021
14 Mile Creek & McCraney Creek Flood Mitigation Study	2024
Lower Morrison and Lower Wedgewood Creeks Flood Mitigation Study	2024
Joshua's Creek Flood Mitigation Study	2024
Saville Area Stormwater System Improvement EA Study	2024
Flood Hazard Mapping Study: Sixteen Mile Creek to Lower Morrison Creek	2025
Stormwater Fee Feasibility Study	2025

Project	Description	Year to Construct	Value ($ M)
DRAINAGE IMPROVEMENTS CONSTRUCTED			
Cornwall Road Reconstruction – Chartwell to Morrison	Installation of 2 stormwater infiltration tanks, 1 flood storage tank, new storm sewer, replacement of larger road culvert	2018	3.9
Bridge Road Reconstruction – 4th Line to Lee's Lane	New storm sewer, new and larger road culvert, improved local drainage	2018	1.7
Maplehurst Avenue Storm Sewer	Oversized, new storm sewer with additional capacity, regrading of existing ditches with ditch inlets, improved local drainage	2019	5.1
Coronation Park Channel Improvements	Natural channel design constructed to receive flows from future Westminster Road storm sewer to improve local drainage	2019	1.1
DRAINAGE IMPROVEMENTS CURRENTLY BEING DESIGNED FOR CONSTRUCTION			
York St and Wallace Rd Reconstruction	New, larger storm sewer, increased green boulevard areas for infiltration, improved local drainage	2024	0.8
Westminster Drive Drainage Improvements	Improved ditch network, new storm sewer, ditch inlets, consideration of green infrastructure, improved local drainage	2025	5.8

Project	Description	Year to Construct	Value ($ M)
Brookfield Road Drainage Improvements	Improved local drainage, new storm sewer, consideration of green infrastructure	2025	1.1
St. Jude's Cemetery Culvert Replacement	Replace existing undersized culvert in poor condition with larger culvert to reduce flood risk	2025	6.2
Woodhaven Drive Drainage Improvements	Improved ditch network, new storm sewer, ditch inlets, consideration of green infrastructure, improved local drainage	2026	9.5
North Service Road Reconstruction – Invicta Dr. to Eighth Line	New storm sewer, improved ditch network, new stormwater management facility, area flood reduction	2026	1.9
Lakeshore Rd Culvert Replacement at McCraney Creek	Replace existing culvert that is near its end of useful life with larger culvert sized to handle Regional storm and reduce flood risk	2027	5.9
Bridge Road Reconstruction – Lee's Lane to Sherin Drive	Improved local drainage, new and larger storm sewer, stormwater management facility, consideration of green infrastructure	2028	2.7
CREEK REHABILITATION PROJECTS CONSTRUCTED			
West Morrison Creek Stabilization and Rehabilitation	Creek erosion and stabilization works between McCraney St. and Upper Middle Road	2020	2.4
Munn's Creek - Reaches 33-35	Creek erosion works – Phase 1 construction from Culham St. to Miller Rd.	2022	2.4
CREEK REHABILITATION PROJECTS CURRENTLY BEING DESIGNED FOR CONSTRUCTION			
Munn's Creek - Reaches 33-35	Creek erosion works – Phase 2 construction from Miller Rd. to Upper Middle Road	2025	1.0
Sixteen Mile Creek Outfalls (Lawson St, Randall St, Forsythe St.)	Repairs to 3 existing stormwater outfalls including concrete headwall repairs and creek bank stabilization.	2025	1.8
Rebecca St Slope Rehabilitation @ Sixteen Mile Creek	Slope rehabilitation from creek erosion at Sixteen Mile Creek adjacent to Rebecca Street bridge	2025	1.5
East Morrison Creek Rehabilitation - Iroquois Shore Rd to Post Ridge Dr	Creek erosion works from Iroquois Shore Rd to Post Ridge Rd. EA study currently in progress followed by detailed design and construction.	2028	9.8

Project	Description	Year to Construct	Value ($ M)
SHORELINE IMPROVEMENT PROJECTS CONSTRUCTED			
Tannery and Waterworks Parks Shoreline Rehabilitation	Rehabilitation of shoreline protection from high lake levels	2018	8.5
Gairloch Gardens Shoreline Rehabilitation	Shoreline rehabilitation and outfall repairs caused by high lake levels and wave action.	2020	0.8
Vista Promenade, Water's Edge Park, Bronte Heritage Waterfront Park Shoreline Improvements	Rehabilitation of shoreline protection from high lake levels	2021	2.7
Dingle Park Shoreline Protection Repairs	Repair damage to shoreline projection from the high lake water levels experienced between 2017 and 2019.	2023	0.4
SHORELINE IMPROVEMENT PROJECTS CURRENTLY BEING DESIGNED FOR CONSTRUCTION			
Holyrood and Shorewood Promenade Rehabilitation	Shoreline improvements to reduce erosion risk and protect the toe of the natural bluff from high lake levels.	2024	1.1
Shell Park Shoreline Rehabilitation	Improvements to shoreline to reduce erosion risk from high lake levels and construct habitat feature for Bank Swallows.	2024	1.9
HARBOUR SEAWALL PROJECTS CONSTRUCTED			
Shipyard Park and Oakville Harbour	Seawall rehabilitation and rebuild for higher lake levels	2024	8.4
10-YEAR CAPITAL FORECAST (2025 to 2034)			
Drainage Improvements	13 projects including update to Stormwater Management Master Plan	2025 to 2034	41.5
Creek Rehabilitation	15 projects including 11 creek erosion rehabilitation projects	2025 to 2034	34.5

Project	Description	Year to Construct	Value ($ M)
Shoreline Improvements	7 shoreline improvement projects	2025 to 2034	13.5
Harbours	2 harbour seawall rehabilitation and improvement projects	2025 to 2034	6.5
Stormwater Management Ponds	9 sediment cleanout projects and 2 retrofit projects	2025 to 2034	13.6
Stormwater Network Maintenance and Minor Rehabilitation	Annual stormwater network maintenance and minor rehabilitation activities over 10-year program.	2025 to 2034	21.1

Appendix B – ServiceOakville Flood Calls Request Handling

When a request is received by ServiceOakville, Citizen Service Representatives ask probing questions to determine the affected area and possible cause of the issue. Based on the information received, the following guidelines are used:

Requests are forwarded to Works Operations for**:**

- Flooding issues related to catch basins, ditches, culverts, stormwater management ponds, creeks, or surface flooding on sidewalks and roadways on Municipal Property
- If the overall property is flooded and the source is unknown, Works Operations would inspect to determine the cause

Depending on the outcome, Works Operations would coordinate with Transportation and Engineering, Conservation Halton, or Halton Region. Works Operations may also determine that there is a grading issue on their property or with their neighbour which would be a civil matter.

Requests are assigned to Building Services for the following when there is an active permit**:**

- Flooding is caused by construction at a neighbouring property
- Flooding in an unassumed area
- A property under construction is flooded

Requests are transferred to Halton Region for the following:

- Flooding caused by watermain breaks or wastewater (sewer and sanitation)
- Basement flooding

Requests are assigned to Municipal Enforcement for the following:

- Water accumulation is caused by the downspout from someone else's property
- Work on a neighbouring property has been completed within the last six months and they did not obtain a permit

Requests are assigned to Parks and Open Space for the following:

- Parks or the towns outdoor recreational amenities
- Trails
- Municipal Harbours
- Town trees

During an event, the web and social media team update the town's website and social media channels to include information on basement flooding, who to contact, flood-related closures on town parks/trails, flood-prevention (such as clearing catch

basins) and flood safety (such as staying away from fast-moving water on creeks). Halton Region and Conservation Halton messaging is also reposted on town social media channels.