

Notes

- Community Planning, Regulation & Mobility Committee
- Thank you Chair and Committee Members
- Kellie McCormack, Director, Planning & Regulations at Conservation Halton (CH)
- CH staff recently presented two reports to the Board regarding Flood Hazard Mapping; 1) City's Phase 2 Flood Hazard Assessment, 2) CH's East Burlington Creeks Flood Hazard Study
- CH Board resolutions:

Agenda Item 7.3 – CH Board Report No. CHB 08 23 04

THAT the Conservation Halton Board approves updated flood hazard mapping for the Lower Rambo Creek watershed based on the results of the "Major Transit Station Area (MTSA) Phase 2 Flood Hazard Assessment, Burlington GO and Downtown" report prepared by WSP, dated March 6, 2023, and local updates completed by Conservation Halton staff;

And

THAT the Conservation Halton Board directs staff to incorporate the approved mapping into Conservation Halton's Approximate Regulation Limit mapping in 30 days to allow time for Burlington City Council to discuss the initiation of a City study that assesses and evaluates potential solutions to mitigate or reduce flood hazard risks in downtown Burlington / Burlington GO MTSA and build climate change resiliency, in collaboration with Conservation Halton.

Agenda Item 7.4 – CH Board Report No. CHB 08 23 05

THAT the Conservation Halton Board approves updated flood hazard mapping for Tuck Creek, Shoreacres Creek, Appleby Creek, and Sheldon Creek based on the results of the "Hydrology Report – East Burlington Creeks Flood Hazard Mapping Update" and "Hydraulics Report – East Burlington Creeks Flood Hazard Mapping Update" prepared by WSP E&I Canada Limited, both dated September 2023;

And

THAT the Conservation Halton Board directs staff to incorporate the approved mapping into Conservation Halton's Approximate Regulation Limit mapping in 30 days to allow time for Burlington City Council to discuss the initiation of a City study that assesses and evaluates potential solutions to mitigate or reduce flood hazard risks in the East Burlington Creeks study area and Appleby GO MTSA and build climate change resiliency, in collaboration with Conservation Halton.

- In order to mitigate and protect from flooding it's important to understand the different types and sources.
- Urban Flooding occurs when the urban drainage system consisting of sewers and roadways is overwhelmed by excessive rainfall and runoff that cannot be absorbed into the ground. Water ponds in parking lots, submerges streets, seeps into homes, and backs up into basements.
- Shoreline or Coastal Flooding occurs when normally dry land is flooded by high lake water levels, storm surges or ice-jamming.
- Focus of the Flood Hazard mapping discussed in this presentation relates to riverine flooding.
- Riverine Flooding occurs when excessive rainfall or snowmelt causes a watercourse to overtop its banks and flood surrounding lands that would typically be dry. The magnitude of riverine flooding is determined by many factors including amount and intensity of rainfall, soil conditions and land elevations.

- Riverine flood hazards are comprised of floodplains and spills.
- A floodplain is an area of land flooded by a nearby watercourse during large storms. After the storm passes, the floodwaters recede back to the creek.
- A spill occurs when flood waters leave a watercourse, its valley and floodplain, and continue to flow overland in multiple directions before rejoining the same watercourse downstream, spilling into another watershed, remaining within the spill area, or mixing with urban drainage.
- Spills can be caused by backwatering upstream of crossings or by sloping ground elevations and typically flow in multiple directions, often in complex patterns.
- The flood hazard limit is determined by the extent of the floodplain and spill hazard.

- All agencies have roles and responsibilities related to flood hazard mitigation and management. Refer to slide for summary.
- Local and Regional Municipalities are focused on emergency preparedness and management leading up to and during a flood event, subwatershed and land use planning, and flood prevention and recovery initiatives such as the basement flooding subsidy.
- Municipalities are also responsible for capital works and municipal infrastructure to manage and mitigate impacts from flooding hazards. For example, implementing infrastructure improvements like culvert replacements.
- Conservation Authorities (CAs) are involved in flood forecasting and warning, operating water control infrastructure, implementing regulations in hazardous lands, and creating flood hazard mapping.
- CH's priority to protect people and property from risks related to natural hazards (e.g. flooding & erosion hazards) and to ensure that new hazards are not created or existing ones are aggravated.
- Under the Conservation Authorities Act, CAs must provide programs and services related natural hazards risk management. Ontario Regulation 686/21: Mandatory Programs and Services provides direction for specific programs and services that CAs must provide including:
 - understanding, managing, and preventing or mitigating risks related to natural hazards
 - flood forecasting, warning and operation of flood infrastructure (dams and channels)

- delineating and mapping areas of natural hazards, such as floodplains
- commenting on development plans about risks related to natural hazards
- acting on behalf of the Province to ensure decisions under the Planning Act are consistent with Provincial natural hazard policies
- carrying out regulatory responsibilities

- Flood hazard mapping identifies areas susceptible to riverine flood hazards and ensures that flood risk areas are identified and understood, to help protect people and property.
- It is important to note that flood hazard mapping does not create a flooding hazard, it shows where the hazard already exists.
- New tools and technologies allow us to better understand the magnitude and extent of riverine flooding (this includes better computer models capable of complex calculations (as required for 2D modelling) and access to detailed topographic data using LiDAR).
- Flood hazard mapping supports:
 - CH regulatory & planning and flood forecasting & warning programs
 - municipal emergency management, flood mitigation & infrastructure design
 - residents and property owners emergency preparedness and planning
- CH renewed its Floodplain Mapping program in 2018 with funding from the Region of Halton which supported access to grant programs from the Provincial and Federal governments. The goal of the Floodplain Mapping Program is to update flood hazard mapping for our entire jurisdiction over the next several years.

- CH initiated the East Burlington Creeks Flood Hazard Mapping study and retained the Engineering firm WSP, through funding from the Region of Halton, and grant funding from the Provincial and Federal governments through the National Disaster Mitigation Program.
- The purpose of this study is to undertake a comprehensive update of riverine flood hazard mapping for the Tuck Creek, Shoreacres Creek, Appleby Creek and Sheldon Creek watersheds, from their headwaters along the Niagara Escarpment to their outlet at Lake Ontario. In some locations, the study area extends beyond these four watersheds to follow spill flow pathways to their respective outlets.
- CH coordinated closely with planning, engineering and emergency response staff from our partners at Halton Region, the City of Burlington and the Town of Oakville, through a Technical Advisory Committee. Committee members were involved in all key study decisions, provided local insight and supported the review of all study materials.
- Engagement is also a critical component of the study, which is why we held an initial consultation session in 2021 to highlight the start of this study and request information on past flooding, as well as in Spring 2023 to present draft mapping and to allow stakeholders and the public an opportunity to provide feedback, observations and questions on the draft mapping.

- Final mapping was recently brought forward to CH's Board for approval to incorporate into CH's Approximate Regulation Limit (ARL) Mapping.
- This mapping is considered the best available information for understanding the magnitude and extent of the flood hazard, assessing potential risk to life and property, and land use and regulatory decision making.

- The City of Burlington initiated a Phase 1 Flood Hazard and Scoped Stormwater Management Assessment for downtown Burlington and the Burlington GO MTSA, which was completed in 2020.
- Prior to the Phase 1 Study, the creeks south of the diversion channel in the Lower Rambo Creek watershed were considered part of the municipal storm drainage system.
- Phase 1 study revealed that the extent of the flood hazard in the Lower Rambo watershed was greater than previously understood.
 - Greater flooding and erosion risk than previously expected
 - Drainage area of approximately 260ha (previously understood to be <130ha)
 - Substantial spill flood hazard from Upper Rambo into Lower Rambo
- Based on the text of Ontario Regulation 162/06, the Lower Rambo watershed was confirmed to be regulated by CH.

- The City of Burlington retained WSP to undertake a Phase 2 study to update the Phase 1 flood hazard modelling and mapping for tributaries within the Rambo and Hager Creek watersheds, located with Downtown Burlington and the Burlington GO MTSA.
- Burlington Council received the final MTSA Phase 2 Flood Hazard Assessment, Burlington GO and Downtown on July 11, 2023.
- The mapping and modelling developed as part of the Phase 2 Study is considered the best available information for understanding the magnitude and extent of the flood hazard, assessing potential risk to life and property, and land use and regulatory decision making.
- The public was informed of the study and the forthcoming changes to Conservation Halton's Approximate Regulation Limit mapping. Staff recommended that the CH Board approve the updated flood hazard mapping for immediate incorporation into CH's ARL mapping.

- Brief overview of mapping.
- There are some areas where the flood hazard limit (and extent of CH's regulated area) has expanded and other areas where the limit (and extent of CH's regulated area) has decreased.
- The changes in the mapping are due to a number of factors including:
 - 1) new tools and technologies that allow us to better understand the magnitude and extent of riverine flooding (this includes better computer models capable of complex calculations (as required for 2D modelling) and access to detailed topographic data using LiDAR)
 - 2) use of different modelling platforms
- The key difference between these studies and past work is the mapping of spills, which were previously only represented by an arrow or opening in the floodplain limit at the point of spill.
- It is important to note that although we are now able to define spills and model and map the floodplain with greater precision using new

technology, it does not mean these areas were not flood susceptible in the past.

- New tools, technologies, and funding support better understanding and mapping of flood hazards, as well as decision making.
- Newly-mapped flood hazards (floodplains and spills) fall within Strategic Growth Areas.
- Competing Provincial objectives and policies related to growth and development and natural hazards.
- Current Provincial regulations, policies and technical guidelines related to natural hazards are out of date.
- Solutions exist to mitigate potential risk to public safety or of property damage, increase opportunities for growth and development, and build climate change resiliency.
- CH has regulatory policies that allow for development in flood hazards (subject to criteria) and is committed to working with the residents, members of the development community, and the City.