



CITY OF HAMILTON
PUBLIC WORKS DEPARTMENT
Hamilton Water Division

TO:	Chair and Members Public Works Committee
COMMITTEE DATE:	September 30, 2019
SUBJECT/REPORT NO:	Beach Boulevard Community Stormwater Ponding Study (PW19084) (Ward 5)
WARD(S) AFFECTED:	Ward 5
PREPARED BY:	Angela Doyle (905) 546-2424 Ext. 6020
SUBMITTED BY:	Mark Bainbridge Director, Water & Wastewater Planning & Capital Public Works Department
SIGNATURE:	

RECOMMENDATION(S)

- (a) That Appendix “A” attached to Report PW19084, respecting the Beach Boulevard Community Stormwater Ponding Study, be endorsed;
- (b) That staff be directed to proceed with the next steps in the planning of infrastructure improvements to the Beach Boulevard Community through a Municipal Class Environmental Assessment including Public Consultation;
- (c) That a transfer of landlocked City parcels abutting the Ministry of Transportation Noise Barrier wall to the Ministry of Transportation at a nominal consideration (Two dollars - \$2) be approved as per details in Appendix “B” attached to Report PW19084;
- (d) That the Planning and Economic Development Department be directed to undertake a City initiative, for properties on the west side (bay side) of Beach Boulevard, to amend;
 - (i) The “C S/1436 and S/1436a” (Urban Protected Residential, etc.) and the “G/S-1436” (Neighbourhood Shopping Centre, etc) districts in Hamilton Zoning By-law No. 6593 to increase the minimum ground floor elevation of any building or addition from 76.0 metres to 76.5 metres above sea level; and

OUR Vision: To be the best place to raise a child and age successfully.

OUR Mission: To provide high quality cost conscious public services that contribute to a healthy, safe and prosperous community, in a sustainable manner.

OUR Culture: Collective Ownership, Steadfast Integrity, Courageous Change, Sensational Service, Engaged Empowered Employees.

- (ii) The Neighbourhood Commercial (C2) Zone in Zoning By-law No. 05-200 to include similar restrictions respecting the elevation, setbacks and other requirements from Zoning By-law No. 6593.

- (e) That a hold be placed on the sale of City of Hamilton owned properties located in areas where future stormwater infrastructure may be installed; this hold is recommended until the Municipal Class Environmental Assessment is completed and preferred solutions are confirmed.

EXECUTIVE SUMMARY

The City of Hamilton (City) has experienced extremely high Lake Ontario water levels in 2017, and again in 2019. The high water levels were likely the result of precipitation due to climate change. There was also an alteration to the International Joint Commission (IJC) water level management strategy which may have had an impact on the water level in Lake Ontario.

The Beach Boulevard community has been severely impacted by ponding water on City Rights of Way (ROW) and on private property. The Hamilton Water Division undertook the Beach Boulevard Community Stormwater Ponding Study (Study) to investigate the cause of water ponding on the ROW and potential mitigation measures that could be implemented to minimize future ponding impacts. Dillon Consulting Limited (Dillon) was retained by the City to conduct the study, and the associated 2-D modelling. The following mitigation measures were noted as preferred alternatives which required further investigation:

Operation & Maintenance

- Development of a Maintenance Agreement between the City and the Ministry of Transportation (MTO) for assets in the Beach Boulevard community (e.g. stormwater ditches, outlets and catch basins, etc.).
- Transfer of landlocked City parcels abutting the MTO Noise Barrier wall to the MTO at nominal consideration.

Legislative

- Amendment of the Hamilton Zoning By-law No. 6593 to increase the minimum ground floor elevation of buildings from 76.0 metres above sea level (MASL) to 76.5 MASL and to prohibit new construction of crawl spaces or basements.
- That a hold be placed on the sale of City of Hamilton owned properties located in areas where future stormwater infrastructure may be installed. This hold is recommended until the EA is completed and preferred solutions are confirmed. Dillon's study has also recommended that a hold be placed on sale of City owned

properties in areas where there has been historical or modelled ponding. The Real Estate Department will consult with the Public Works Department for all sales of City owned property in the area. New structures will need to be in conformity with future Zoning By-law No. 6593 changes recommended under this study.

Lot Level

- Installation of backwater valves on sanitary lines of private residences under the City of Hamilton's Protective Plumbing Program to protect private property from surcharging. This program is a resident initiated request program for properties zoned as single family dwelling; requests by residents must follow the City's documented Protective Plumbing Program.

Infrastructure

- Upgrade the existing stormwater system in coordination with major road work.
- Installation of new outlets and new pumping stations after an Municipal Class Environmental Assessment (EA) has been undertaken to confirm the best location.

Alternatives for Consideration – See Page 8

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: The study recommends an EA be undertaken to assess feasibility of infrastructure (e.g. pumping station, outlet, storm sewer) related mitigation measures. The funding related to the EA, and any subsequent infrastructure projects which are defined under the EA, will be recommended to Council in a future Rates Capital Budget. The study did note that up to two pumping stations may be required to address stormwater ponding on the right of way. A conceptual cost estimate for the construction of a new station is likely to be greater than \$7,500,000 per station.

Although the study recommends upgrading the stormwater collection system, the City's EA and the MTO closed circuit television (CCTV) inspection of infrastructure under the Queen Elizabeth Way (QEW) (initiated May 2019) must be completed first to ensure proper design. The anticipated cost for upgrading the stormwater collection system is \$3,000,000, if done in conjunction with planned road reconstruction. There is scheduled road resurfacing planned for Beach Boulevard in 2020; this

work will proceed as originally scheduled and will be independent of any EA infrastructure recommendations.

The total capital cost estimates based on recommendations in the study total \$18,000,000. This cost includes the proposed pumping stations (2 for \$15,000,000) and storm sewers (\$3,000,000).

Staffing: Existing staff levels can accommodate the work recommended within this report. Future assessment of staffing requirements will need to be undertaken if additional infrastructure is recommended under the EA process.

Legal: Transfer of landlocked parcels to MTO will require updated property information from the Land Registry Office.

The City will need to amend the Zoning By-law No. 6593 to increase the ground floor elevation of new buildings from 76.0 MASL to 76.5 MASL. In addition, there are seven properties on west side of Beach Boulevard that were included in Zoning By-law No. 05-200 in 2017 but the flooding related restrictions were not carried forward. As a result, an amendment to Zoning By-law No. 05-200 is also required.

An EA is required for stormwater pumping stations under the *Environmental Assessment Act*, R.S.O. 1990.

HISTORICAL BACKGROUND

The Beach Strip area is prone to flooding; the earliest recorded flooding dates back to 1943. Long-time area residents have communicated to the project team that the area floods and that they are aware of the high water table on their properties. According to original area drawings, the side streets extending off of Beach Boulevard drained directly to the harbour. Over time, the area was built up to allow for the installation of the QEW; this altered the original drainage pattern for the Beach Boulevard community.

In 1999, the City retained Marshall Macklin Monaghan (MMM) to complete a Master Drainage Plan for the Beach Boulevard Community. This study concluded that flooding occurs in the study area when lake water levels exceed 75.2 MASL. Additionally, ponding would occur on side streets during the two-year storm frequency because the stormwater system did not have enough capacity to convey this flow. Updates were made to the stormwater system and By-laws were put in place to limit the number of additional basements and crawl spaces that could be built in this area.

Flooding in the area continued to occur, and the MTO retained McCormick Rankin Corporation (MRC) to conduct a study regarding the flooding in the QEW ROW in 2008. MRC concluded that the street flooding problems can be attributed to a combination of the minimal elevation difference between lake water levels, Beach Boulevard, and land use changes over time. MRC also concluded that several of the end-of-street catch basins were in extremely poor condition and would require water to pool on the street before it could overflow into the pipe network because catch basins were not located at the localized lowest spot. The report recommended a pump station with a discharge outlet into a ditch on Eastport Drive. The City and MTO worked together to install the Grafton Pumping Station to address drainage concerns in the area.

In 2017, the IJC, which governs Lake Ontario Water levels, replaced Plan 1958-D with Plan 2014. Plan 1958-D allowed the level of Lake Ontario to fluctuate 1.23 m (74.00 MASL to 75.23 MASL). Plan 2014 allows the level of Lake Ontario to fluctuate 1.57m (73.56 MASL to 75.73 MASL) allowing for higher high lake levels than in the past.

On May 29, 2017, Lake Ontario recorded a high water level of 75.88 MASL. The result was widespread flooding across Ontario, Quebec and the USA. The high water level, in conjunction with severe storms, resulted in large amounts of ponding water on City ROW. The City attempted to mitigate the large amount of water ponding on City ROW by installing temporary equipment (e.g. pumps / hoses) on the majority of side streets to move the water back into Lake Ontario. Residents also undertook activities to minimize risk to their property by dewatering their basements and discharging onto City sidewalks or ROW; this in turn caused safety concerns.

In 2019, the City is experiencing high Lake Ontario water levels as a result of precipitation due to climate change. The water level has exceeded the 2017 maximum of 75.88 MASL and a new record has been set at 75.92 MASL (HCA - June 6, 2019).

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

Policy implications affecting or impacting this report include:

- Sale of Surplus lands policy in the areas where future stormwater infrastructure may be installed will be placed on hold until the EA is completed and the City identifies which parcels are not required for recommended works. Sale of other City of Hamilton owned properties in this area must be done by the Real Estate Section in consultation with the Public Works Department and should be in conformity with future Zoning By-law No. 6593 changes recommended under this study.
- Newly constructed storm sewers are designed and constructed in accordance with the City's current standards for Level of Service. However, many existing sewers in the City, including many of the sewers in the Beach Boulevard

community, do not meet the City's standards related to five-year design storm event for new sewers, as documented in the Comprehensive Development Guidelines and Financial Policies Manual 2018. Hamilton Water's standard approach is to upgrade the sewers to current standards through State-of-Good Repair replacements; the sewers are replaced and upgraded when they reach the end of their useful life. Sewers in adequate condition are not typically upgraded to current standards in the absence of coordinated work. The recommendation for early replacement of sewers in this community is project-specific, to address unique conditions, and differs from the City's standard practice. Early replacement of assets results in an increased cost to the City over the long-term.

Legislation requirements affecting or impacting this report include:

- Zoning By-law No. 6593 – In 1999, the City implemented a ground floor elevation of 76.0 MASL to address potential flooding. Additional work by Dillon has indicated a need to alter the ground floor elevation to 76.5 MASL to accommodate the higher Lake Ontario operating levels by the IJC under Plan 2014. In addition, there are seven properties on west side of Beach Boulevard that were included in Zoning By-law No. 05-200 in 2017 but the flooding related restrictions were not carried forward. As a result, an amendment to Zoning By-law No. 05-200 is also required.
- *Environmental Assessments Act*, R.S.O. 1990 – A Municipal Class Environmental Assessment will be required for infrastructure related options recommended in the Beach Boulevard Community Stormwater Ponding Study.
- Ontario Regulation 161/06, Hamilton Conservation Authority's Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses –under *Conservation Authorities Act*, R.S.O 1990, c. C.27.

RELEVANT CONSULTATION

During the development of the Beach Boulevard Community Stormwater Ponding Study, the project team undertook extensive consultation with both internal and external parties. Internal staff included representatives from Public Works (Asset Management, Engineering, Roads, Operations, Hamilton Water, Parks, and Forestry), Planning & Economic Development (Real Estate, Infrastructure Planning, Site Plan, Zoning, and Building), Corporate Services (Risk). External agency liaison was made with the Hamilton Conservation Authority, Hamilton Port Authority, Ministry of Transportation, and Environment Canada.

Based on consultation and modelling activities conducted by Dillon, the recommendations of the report have been developed and vetted by the stakeholders noted above.

Additionally, the Ministry of Transportation initiated an assignment in May 2019 to assess existing culverts under the QEW which fall under MTO control. MTO staff has confirmed that the CCTV findings will be provided to the City upon completion.

The project team further consulted with staff from Public Works (Asset Management, Roads, Operations, Hamilton Water) and Planning & Economic Development (Real Estate, Infrastructure Planning, Zoning) to validate the context of this report.

ANALYSIS AND RATIONALE FOR RECOMMENDATION(S)

Dillon was retained by Hamilton Water to develop a list of options which could be employed by the City to address ponding on the City owned ROW. The study assessed City / MTO drawings, previous studies, meetings with stakeholders, as well as in-field knowledge.

The transfer of landlocked City parcels abutting the MTO Noise Barrier wall to the MTO at a nominal consideration is recommended to facilitate proper maintenance of a drainage ditch located in this area by the MTO. Currently, the City is obligated to have the approval of the MTO to access MTO property or to alter areas of City property that fall within the area of the MTO Limit of Buffer Control. Failure to properly maintain City property may lead to additional risk claims from properties adjacent to City landlocked properties.

An update to the Hamilton Zoning By-law 6593 to amend the ground floor elevation from 76.0 MASL to 76.5 MASL is required to address private property flooding issues. This recommendation is based on an updated operating strategy for allowable Lake Ontario water levels by the IJC under Plan 2014 (e.g., Plan 1958-D 74.00 MASL to 75.23 MASL, Plan 2014 – 73.56 MASL to 75.73 MASL).

In addition, there are seven properties within Zoning By-law No.05-200 that require the same restrictions (e.g. minimum building elevation, setbacks and other requirements) from Zoning By-law No. 6593, as other properties on the west side (bay side) of Beach Boulevard. An amendment to this By-law will also be required.

Retention of City owned property in the area is recommended to avoid a situation where the City will need to re-purchase a previously owned City property later if land is required for stormwater infrastructure installation. Retention of City owned properties in areas where flooding has historically occurred, or has been modelled to occur, is also recommended by Dillon's study to avoid situations where a home is built in area known to flood. The Real Estate Department will consult with the Public Works Department for all sales in the area; through this process, staff will have an opportunity to confirm any issues with the sale of the City property. Future buildings in this area will need to be in conformity with future Zoning By-law No. 6593 changes recommended under the study.

For infrastructure related recommendations, a 2-D modelling component was added onto the assignment late in the process to better define preferred options which could address ponding in the ROW. A series of sixteen scenarios were simulated using two different lake levels, four different storm frequencies and two different outlet conditions. The two lake levels represent the highest recorded lake level as of 2018 (75.88 MASL) and the highest minimum target lake level under plan 2014 (74.56 MASL). The four storms that were selected represent the two year, five year, ten year and 100 year return intervals. The two outlet configurations modelled were for the existing single gravity outlet and for an increased triple gravity outlet for each sub-system operating in the Beach Boulevard community.

Dillon was able to tailor the preferred infrastructure solution to the different outlet systems in the area. Recommendations related to installation of a new pumping station will require an EA to confirm feasibility from various standpoints (e.g. social, economic, legal, etc.).

ALTERNATIVES FOR CONSIDERATION

Alternatives considered in the study but not recommended are:

Retention of Land:

- The City may opt to retain landlocked property abutting the Ministry of Transportation (MTO) Noise Barrier wall rather than transfer the properties to the MTO. This alternative will result in a situation where the City is unable to maintain its property or is delayed in responding to flooding in these areas. Financially, the City should expect to experience similar maintenance costs to what existed in the recent 2017 and 2019 response for this area. There should be no additional staff required if the City did opt to retain the landlocked property. There are several legal implications to consider:
 - 1) The City is obligated to have the approval of the MTO to access MTO property or to alter areas of City property that fall within the area of MTO Limit of Buffer Control.
 - 2) The City may see increased risk claims for properties adjacent to the City landlocked properties.

Retention of existing Hamilton Zoning By-law No. 6593 Requirements:

- The City may opt to retain existing Zoning By-law requirements for the area. Currently, the By-law requires the ground floor elevation to be set at 76.0 MASL and there is allowance for crawl spaces. Financially, the City should expect to see similar maintenance costs to the 2017 and 2019 years. There should be no

additional staff required if the City did opt to retain the existing Zoning By-law requirements. Legally, the City may see increased risk claims due to flooding allowing sale of City property.

- The City may opt to sell all City property in the lower elevation areas. Financially, there would be benefit from the initial sale of the property but there may be a need to re-acquire land in the future for installation of stormwater pumping stations or other assets recommended under the EA. There should be no additional staff required if the City did opt to continue sale of City property in the area. Legally, the City may see increased risk claims due to flooding; new houses will be built on the sold property and the new structure may be built with below ground infrastructure (e.g. basement / crawlspace) which may be susceptible to flooding.

Not Undertake New Infrastructure Upgrades in the Area:

- The City may opt to maintain existing system and stormwater capabilities in the area. This scenario will result in similar flooding situations should lake levels be elevated in future years. There will be financial and legal implications for the City related to flood response in ROW (e.g. equipment set up, operation, and maintenance), potential injury claims for staff / citizens, as well as claims to the City Risk Management Section for flooding on private basement / crawl spaces. There should be no additional staff required if the City did opt to maintain existing infrastructure only.

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

Healthy and Safe Communities

Hamilton is a safe and supportive City where people are active, healthy, and have a high quality of life.

Clean and Green

Hamilton is environmentally sustainable with a healthy balance of natural and urban spaces.

Built Environment and Infrastructure

Hamilton is supported by state of the art infrastructure, transportation options, buildings and public spaces that create a dynamic City.

APPENDICES AND SCHEDULES ATTACHED

Appendix “A” - Beach Boulevard Stormwater Ponding on Right of Way Study

Appendix “B” - Property Ownership, 2019, Geomatics & Corridor Management