

Legislative
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de l'Ontario

STANDING COMMITTEE ON PUBLIC ACCOUNTS

VALUE-FOR-MONEY AUDIT: CLIMATE CHANGE ADAPTATION: REDUCING URBAN FLOOD RISK

(2022 ANNUAL REPORT OF THE OFFICE OF THE AUDITOR GENERAL OF
ONTARIO)

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The Honourable Ted Arnott, MPP
Speaker of the Legislative Assembly

Sir,

Your Standing Committee on Public Accounts has the honour to present its Report and commends it to the House.

Tom Rakocevic, MPP
Chair of the Committee

Queen's Park
December 2024

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INTRODUCTION

On April 3, 2023, the Standing Committee on Public Accounts held public hearings on the value-for-money audit of Climate Change Adaptation: Reducing Urban Flood Risk (*2022 Annual Report* of the Auditor General of Ontario).

The Committee thanks the Auditor for the audit. In this report, the Committee presents its own findings, views, and recommendations. The Committee requests that the Ministry provide the Clerk of the Committee with written responses to the recommendations within 120 calendar days of the tabling of this report with the Speaker of the Legislative Assembly, unless otherwise specified.

ACKNOWLEDGMENTS

The Committee extends its appreciation to officials from the Ministry of Natural Resources and Forestry; the Ministry of the Environment, Conservation and Parks; the Ministry of Municipal Affairs and Housing; and the Ministry of Infrastructure. The Committee also acknowledges the assistance provided by the Office of the Auditor General, the Clerk of the Committee, and Legislative Research.

BACKGROUND

Urban flooding occurs when heavy precipitation overwhelms the capacity of built or natural stormwater drainage systems, and is mainly caused by periods of intense rainfall rather than snowmelt. Urban floods can occur in any developed community, regardless of size or proximity to a water body. Urban flooding entails multiple impacts, including economic, social, health, and environmental consequences.

The increased concentrations of greenhouse gases in the atmosphere are contributing to climate change, with the warming atmosphere changing weather patterns. In Ontario, heavy rainfall events are increasing in both frequency and intensity. Techniques to adapt to the changing climate (specifically regarding urban flooding) revolve mainly around creating and enhancing green spaces, as well as planning and designing built stormwater management controls that can withstand future projected rainfall.

Green spaces include wetlands, woodlands, meadows, and parks. They help to reduce urban flooding by absorbing and retaining rainwater, while also allowing for more evaporation through soil and transpiration through plants compared to hardened, developed surfaces.

Stormwater management involves the collection and control of stormwater runoff generated through rainfall and snowmelt. Stormwater management controls are generally categorized into two groups:

- grey stormwater infrastructure – includes conventional elements, mostly built of concrete and metal elements such as roadside catch basins, culverts, ditches and sewer pipes; and
- built green stormwater infrastructure – also referred to as “low-impact development practices,” refers to built elements that mimic the functions

of natural green spaces. Examples include green roofs, vegetated strips alongside roads, and pervious pavement.

Four ministries share the key responsibilities for addressing urban flooding – the Ministry of the Environment, Conservation and Parks; the Ministry of Natural Resources and Forestry; the Ministry of Municipal Affairs and Housing; and the Ministry of Infrastructure. Each ministry is responsible for certain aspects of reducing urban flood risk, as follows:

- The Ministry of the Environment, Conservation and Parks (MECP) leads the Province’s climate change adaptation effort, including climate change risk assessment. It also leads policy on stormwater management for the purposes of environmental protection (i.e., to protect water quality from contaminated stormwater), and approves the construction of municipal stormwater management facilities for environmental protection purposes.
- The Ministry of Natural Resources and Forestry (MNRF) leads flood hazard management programs that focus on rivers, streams and lakes. The ministry also leads programs to protect natural features (including wetlands) and provides guidance for flood hazard mapping of areas near rivers, streams and lakes.
- The Ministry of Municipal Affairs and Housing (MMAH) develops policies and laws relating to land use and growth planning, including policies that require municipalities to plan for stormwater management and protect natural features. The ministry can also set out measures to reduce flooding in buildings and homes through standards in the Ontario Building Code.
- The Ministry of Infrastructure (MOI) oversees municipal asset management planning, including requirements to financially plan for municipal stormwater infrastructure construction and management.

AUDIT OBJECTIVE AND SCOPE

According to the Auditor General, the objective of the audit was “to assess whether [the four responsible ministries] collectively have effective systems and processes to:

- ensure that the risks of urban flooding in Ontario, including the risks under future projected climate scenarios, are identified, shared with relevant parties, and used to inform decision-making; and
- reduce the risks of urban flooding, and support and encourage municipalities, government agencies, property owners and other relevant parties to reduce the risks of urban flooding, in accordance with legislation, regulations, policies and best practices.”

The audit was conducted between January and August of 2022, and included interviews with ministry staff and external stakeholders, tours of infrastructure facilities, reviews of documents, and surveys of building officials and municipalities.

ISSUES RAISED IN THE AUDIT AND BEFORE THE COMMITTEE

Emerging Trends and Municipal Stormwater Infrastructure

The MECP launched a multi-sector provincial-level climate change impact assessment in 2020. Committee members were interested in the MECP's forecasting of climate conditions, and whether the Ministry used the climate scenarios published by the Intergovernmental Panel on Climate Change (IPCC) in its assessment. The MECP clarified that, while the Ministry does not question the [IPCC report](#), the assessment involved a different, more Ontario-specific methodology. The MECP received the Ontario Climate Change Impact Assessment in January 2023, and released the document on August 25, 2023. The ministries were asked what they are doing to better prepare municipalities for the changing climate. The Committee heard that there is a collaborative effort across ministries in this area. The MECP is focusing on information sharing; a consolidated linear infrastructure approach to approve stormwater systems (which is a more systemic method, compared to a pipe-by-pipe approach); and low-impact development (also known as green infrastructure). The MNR mentioned the continuous updating of the flood-hazard mapping and the acquisition of elevation data in high-risk areas.

The Committee mentioned recent reports by the Financial Accountability Office of Ontario (FAO), which assessed the financial impacts of extreme rainfall, extreme heat and freeze-thaw cycles on [public buildings](#) and on [stormwater and wastewater infrastructure](#) in Ontario. The MOI was asked how the projections presented by the FAO are shaping the Ministry's capital planning process. The Ministry said that it is currently in the process of collecting detailed asset management plans from municipalities, and that any changes to capital planning and/or redesign of the stormwater system will only be possible once all the municipal asset management plans are submitted. One of the metrics that municipalities are required to report is the percentage of properties in the municipality resilient to a 100-year storm, as well as the percentage of municipal stormwater management systems resilient to a five-year storm. The plans are due in 2025, at which point the Ministry will hire a third-party adviser to analyze them.

Municipal stormwater infrastructure capacity and planning was a prominent topic of discussion. When asked how the MOI ensures that municipalities are spending their infrastructure funding appropriately, the Ministry said that it will assist municipalities with managing their investments in core infrastructure, including stormwater and wastewater. In cases where municipalities do not produce asset management plans to the Ministry's satisfaction, or spend the funding inappropriately, the Ministry can withhold any infrastructure funding due to the municipalities.

The interaction between older wastewater and stormwater infrastructure and higher-density development was also discussed, with Committee members interested in the impact of building high-rise buildings on older infrastructure. The MMAH said that existing stormwater and wastewater infrastructure is always considered when any new municipal development is proposed, and that there are different considerations depending on the type of area developed (e.g., existing community, green field), and the type and density of development.

The Auditor noted that almost three-quarters of Ontario municipalities do not have a reliable source of municipal funding to finance stormwater infrastructure, such as a water charge or stormwater fee. The Committee asked whether the MECP is sharing best practices around municipal revenue tools with municipalities. The MECP said that it is a regulatory ministry, and that the funding ministry is better positioned to address this issue.

Committee members were also interested in the ways that the MMAH and MOI help smaller municipalities, which lack the appropriate staff and other resources to plan and fund necessary wastewater and stormwater projects. The MMAH said that it has municipal services offices in each of Ontario's five regions, and that the teams working at the service offices build close relationships with the smaller municipalities to better understand their needs and provide support. The MMAH also hosts municipal exchanges on topics of interest and importance to municipalities, including flood prevention. The MMAH hosted two webinars on urban flooding, with 250 municipal officials participating. One of the sessions focused on basement flooding prevention and backwater valves, while the other revolved around risk assessment and climate change-related flood risk management.

The MOI, in turn, mentioned the Ontario Community Infrastructure Fund (OCIF), a program that funds a range of infrastructure projects in small, rural and northern communities, including roads, bridges, water and wastewater facilities. Beginning in 2022, the funding for the program has doubled – from \$200 million to \$400 million per year. The Auditor's report noted, however, that provincial funding for stormwater infrastructure represents just a small portion of this funding; over the past five years, total provincial funding for stormwater infrastructure averaged under \$10 million per year. The MOI also said that it developed a [tool kit](#) to help smaller municipalities to develop strategic asset management policies. Municipalities with a population of less than 25,000 have been receiving assistance from expert consultants, including personalized meetings and actionable recommendations. When asked about other programs available for smaller municipalities to fund their infrastructure projects, the MMAH said that all the funding for the Investing in Canada Infrastructure Program has already been allocated.

Committee Recommendations

The Standing Committee on Public Accounts recommends that:

1. The Ministry of Infrastructure
 - a. provide additional guidance to municipalities on the reporting of asset condition, replacement costs, and stormwater infrastructure service levels;
 - b. assess data gaps in municipal asset management plans, and assist in obtaining the necessary data; and
 - c. provide direction to municipalities on how to consider climate data when estimating stormwater infrastructure service levels.
2. The Ministry of Municipal Affairs and Housing work in collaboration with the Ministry of Infrastructure to develop and share best practices and

guidance with municipalities to assist in the development and implementation of reliable funding models.

Backwater Valves, Home Floodproofing Incentives and Public Education

Another topic of interest was the installation of backwater valves in private homes. Backwater valves are flood-protection devices installed in the main sewer pipe of a home that allow for water to only flow out of the home. One of the Auditor's recommendations called for a review of the requirements in the Ontario Building Code for the installation of backwater valves, and the MMAH was asked about the progress made under this recommendation. The Committee heard that the MMAH believes that the valves are not necessary in every house, and that the MMAH has a publication, [Code and Guide to Plumbing](#), that describes conditions in which the valves are needed for homes located in areas identified as high-risk of sewer backup. The MMAH is currently engaging with building practitioners to assess whether any changes to the Ontario Building Code are required, and is also working on aligning the technical requirements of backwater valve installation to those in the [National Plumbing Code of Canada](#).

The MMAH also spoke to the differences between the backwater valve requirements in Ontario's Building Code compared to the National Construction Codes. The codes require a backflow valve to be installed in all new homes built in high-risk flooding areas or near a wetland, albeit with different technical specifications. While the national code requires manual gate-valve-type application, Ontario's building code requires a pneumatic or automatic manual flap-type control valve, which is activated when a backflow happens. The valves are required in all new builds in Ontario that are deemed to have high flood-risk, based on the grading of land that the home is built on. When the Committee inquired about development on a watershed or in floodplains, the MMAH explained that, from a building code perspective, floodplains should not be developed (the MMAH further explained that development is first controlled through zoning, and secondly, a building permit is only given if the area is deemed constructible and zoned accordingly).

Financial incentives available to homeowners for flood-proofing their homes were also discussed. The Committee heard that, currently, the Ontario government does not provide any subsidies or other financial incentives to homeowners to flood-proof their homes. The MECP said that, rather than providing incentives to individual homeowners, the Ministry is investing in initiatives at a broader, community-resiliency level. The MECP gave the example of \$15 million given to 18 municipalities to improve aging and outdated wastewater and stormwater infrastructure in the Lake Ontario basin. This program is intended to reduce discharge of pollutants and improve water quality in Lake Ontario, but can also support urban flooding resiliency.

As for public education and awareness, the MNRF highlighted a [website](#) with information on emergency preparedness, as well as actions that homeowners can take before, during, and after a flood emergency, both inside and outside the property. The website also includes an interactive map, and the status of flood works across the province.

Committee Recommendations

The Standing Committee on Public Accounts recommends that:

3. The Ministry of Municipal Affairs and Housing review the requirements in Ontario's Building Code for the installation of backwater valves, and provide additional guidance to reduce ambiguity and increase uptake.
4. The Ministry of the Environment, Conservation and Parks work with the Ministry of Finance in consulting on the incentives that could be provided to homeowners to mitigate flood risk in their homes through improvements, and implement appropriate incentives as identified.

Wetlands Evaluation Process and Conservation Authorities

In the audit report, the Auditor recommended that the MNRF implement a "service standard for approving submitted wetland evaluations within a reasonable time frame." When asked about the progress made under this recommendation, the MNRF said that the Ontario Wetland Evaluation System (OWES) was updated and streamlined in December 2022. Under the new, expedited process, MNRF staff do not evaluate a trained wetland evaluator's work, and only require an attestation from the evaluator stating that the evaluation is complete. The MNRF also mentioned that conservation authorities play an important role in the wetland evaluation process, as they are mandated to regulate hazardous areas, including wetlands within their jurisdiction. As such, the conservation authorities review and comment on development applications and land use planning policy, and provide that input to the municipalities involved.

Committee Recommendations

The Standing Committee on Public Accounts recommends that:

5. The Ministry of Natural Resources and Forestry recognize the interdependence of wetland systems within a watershed when considering protections under the Ontario wetland evaluation system.
6. The Ministry of Natural Resources and Forestry consider the feasibility of including the Carruthers Creek Headwaters within the Greenbelt and report back to the Committee on its findings.

Provincial Urban Flooding Framework

One of the Auditor's recommendations called for all four ministries to develop a "provincial framework for urban flooding that clearly identifies and assigns roles and responsibilities for urban flood management." The Committee asked the MNRF about the progress made with regard to this recommendation, and heard that the Ministry will be leading the Flooding Strategy commitment to establish a provincial urban flooding working group. The work will be led by the MNRF's policy division, and done through a deputy committee (the Planning, Environment, Resources and Land Deputies Committee, or PERL), while also involving individuals at the assistant deputy minister and director levels. During the hearing, the MNRF could not commit to a timeline for the working group to meet. In subsequent communication with the Committee following the hearing, the MNRF committed to initiating the urban flooding working group in the summer of 2023.

When asked to provide an example of a flood-management success story, the MNRF mentioned the work resulting from the flooding in Northwestern Ontario in 2022 (this flooding was due to increasing lake, river and creek levels, and not directly related to urban flooding). Following said flooding, the MNRF increased its surveillance of lakes, river systems and critical infrastructure, and shared the information with other emergency-response partners and key stakeholders. The effort focused on raising awareness, sharing information, and assisting in logistics. As a specific example, the MNRF mentioned the unorganized Township of Rugby, which lost access to one of its major highways. In response, the MNRF opened and improved a forestry road to provide a commuting alternative.

Committee Recommendation

The Standing Committee on Public Accounts recommends that:

7. The Ministry of Natural Resources and Forestry continue to lead the provincial urban flooding working group initiative, and publish a timeline of publications and reports stemming from the group's work.

Progress Updates on Select Ministry Initiatives and Other Topics

The Committee was also interested in progress updates on a number of initiatives outside of urban flooding, namely [Ontario's Flooding Strategy](#), Light Detection and Ranging (LiDAR) mapping, management of flood hazards (i.e., from rivers and lakes) and the internal natural disaster mitigation review.

The MNRF shared that the government is prioritizing public awareness and education of flooding and the risks it entails, as well as steps that can be taken to mitigate the risks. Ontario's Flooding Strategy describes eight action areas for the MNRF to address, including, among others, enhancing flood mapping; increasing public awareness and education; clarifying roles and responsibilities; and promoting sound land use planning decisions. The MNRF highlighted the establishment of a multi-agency Flood Mapping Technical Team to support the Ministry in identifying flood hazard areas, with an investment of \$7.3 million between fall 2022 and March 2024. The MNRF is also continuing its partnership with the federal government to provide water level and flow information for watercourses across Ontario, which helps to determine the potential for flooding and provide early-warning messages for flooding.

Regarding the progress of LiDAR mapping, the MNRF said that, as LiDAR is a flyover technology that needs to have a clear view of the ground, it can only be utilized in sunny weather with no tree canopies present. Therefore, the MNRF could not commit to a timeline of LiDAR mapping, as the work is weather-dependent.

In terms of the progress on the internal natural disaster mitigation review, an emergency management review considering all emergencies collectively (i.e., fire, flooding, etc.), the MNRF said that the work should be completed by the end of 2024.

Another line of questioning revolved around a Freedom of Information (FOI) request for documents from the MECP, and the subsequent information received from the Ministry. The Committee mentioned that the FOI request focused on the

incident where 24 billion litres of raw sewage were discharged into Chedoke Creek and Cootes Paradise Marsh. The MECP was asked why the FOI request took two years to complete, and what the Ministry could have done to prevent the incident. The Committee heard that the delay in the completion of the FOI request was due to the pandemic. The MECP further explained that in cities with older, combined sewer infrastructure, like Toronto and Hamilton, significant rain events entail the mixing of sewer and stormwater, and issues of discharge emerge. The MECP stressed that the new, consolidated linear infrastructure approach for approving stormwater systems is expected to prevent such incidents in the future, as it should provide better ministerial oversight of the municipal systems.

CONSOLIDATED LIST OF COMMITTEE RECOMMENDATIONS

The Standing Committee on Public Accounts recommends that:

1. The Ministry of Infrastructure
 - a. provide additional guidance to municipalities on the reporting of asset condition, replacement costs, and stormwater infrastructure service levels;
 - b. assess data gaps in municipal asset management plans, and assist in obtaining the necessary data; and
 - c. provide direction to municipalities on how to consider climate data when estimating stormwater infrastructure service levels.
2. The Ministry of Municipal Affairs and Housing work in collaboration with the Ministry of Infrastructure to develop and share best practices and guidance with municipalities to assist in the development and implementation of reliable funding models.
3. The Ministry of Municipal Affairs and Housing review the requirements in Ontario's Building Code for the installation of backwater valves, and provide additional guidance to reduce ambiguity and increase uptake.
4. The Ministry of the Environment, Conservation and Parks work with the Ministry of Finance in consulting on the incentives that could be provided to homeowners to mitigate flood risk in their homes through improvements, and implement appropriate incentives as identified.
5. The Ministry of Natural Resources and Forestry recognize the interdependence of wetland systems within a watershed when considering protections under the Ontario wetland evaluation system.
6. The Ministry of Natural Resources and Forestry consider the feasibility of including the Carruthers Creek Headwaters within the Greenbelt and report back to the Committee on its findings.
7. The Ministry of Natural Resources and Forestry continue to lead the provincial urban flooding working group initiative, and publish a timeline of publications and reports stemming from the group's work.