Adapting to Extreme Rainfall

The Institute for Catastrophic Loss Reduction celebrates leadership amongst Canadian cities in its latest publication.

BY SOPHIE GUILBAULT

Climatic extremes, including extreme rainfall events, have become more frequent in the second half of the 20th century, causing major flooding events in several parts of the globe. These events represent a major threat to Canadian municipalities with several reported cases of basement flooding in recent years in cities across the country.

Water damage represents the main cause of damage to Canadian homes, costing more than $2 billion annually, much of it being from basement flooding. Considering that this number has been rising for more than 25 years and that severe rainfall events will increase in frequency and severity under our changing climate, there is now an urgent need for Canadians to adapt.

Best practices to protect homes from basement flooding have been thoroughly studied by the Institute for Catastrophic Loss Reduction (ICLR), a world-class disaster risk reduction research institute affiliated with Western University. Actions such as the installation of a backwater valve and sump pump system, disconnecting downspouts and ensuring proper lot grading to direct water away from a home's foundation can all contribute to a reduced risk of basement flooding. Mitigating the impact of severe rainfall events requires a comprehensive plan to rehabilitate and improve municipal infrastructure, as well as actions to involve property owners with waste and stormwater management.

In December 2014, ICLR published a book entitled *Cities adapt to extreme rainfall: Celebrating local leadership.* The publication highlights the efforts of 20 Canadian cities that developed creative approaches to reduce the risk of loss from severe rain events. Several case studies presented in the book showcase how municipal governments have been influencing private homeowners' behaviours.

For example, Quebec City utilized persistent communication with homeowners located in a flood vulnerable neighbourhood until all the targeted downspouts were disconnected. Other communities, such as Moncton, Saskatoon and Winnipeg developed an incentive program to encourage property owners to install a backwater valve. London and Victoria focused their efforts on evaluating the potential of specific actions to reduce the risk of basement flooding in order to develop adequate adaptation measures.

While most municipalities presented in the book became eager to implement adaptation and mitigation programs following extreme rainfall events, some communities like Collingwood, which mandated the installation of backwater valves in new homes, have been proactive in increasing their urban flooding resiliency before large losses happened.

Canadian municipalities have been struggling with aging infrastructure that is often unable to cope with increased stresses and loads. Across the country, several waste and stormwater systems are approaching the end of their service life and the costs associated with their rehabilitation can be extremely high.

Considering that Canadian cities are responsible for the construction and maintenance of their stormwater management infrastructure, Kitchener and Waterloo recently established a sustainable stormwater funding system. In order to do so, the two cities first launched a detailed review of their funding models for stormwater infrastructure, which brought multiple concerns to their attention. Faced with increasing maintenance costs and a growing urbanization happening under climate change, Kitchener and Waterloo started rethinking their approach to stormwater management. Their reflection resulted in the development of a funding mechanism that would provide revenue for infrastructure while giving property owners a more direct awareness of the quality of their infrastructure system and its impact on the environment.

More specifically, the cities decided to replace their tax-based funding model with a user pay approach. Through this transition, Kitchener and Waterloo ensured that users would pay for stormwater services in a way that reflected their use of these services. In order to establish the new fees that would be paid by property owners, the cities calculated the area of impervious surfaces around properties. They then established a tiered funding structure in which smaller properties with less impervious areas pay significantly less money than a large non-residential property with significant impervious surfaces.

For example, the smaller properties in Kitchener could pay as little as $47 a year for their stormwater fee compared to $23,000 for larger non-residential properties. In order to complement the user-pay approach, both Kitchener and Waterloo implemented a stormwater credit program in which property owners that implement onsite stormwater controls to reduce runoff from impervious areas are rewarded by a lower stormwater fee. The user pay approach and stormwater credit programs developed by the two cities has proven to be sustainable on multiple levels. While it encourages property owners to adopt sustainable behaviours, it can also fund the rehabilitation and construction of new stormwater infrastructure.

Several Canadian municipalities have also been tackling issues related to inflow and infiltration. This phenomenon associated with sewer backup happens when excessive amounts of rainwater inflow and groundwater infiltration enter the sewer system. Excessive inflow can be the result of improper connections between roof drain leaders, foundation drains and drainage catch basins while infiltration is mostly associated with cracks and loose joints in sewer lateral connections. In British Columbia, several municipalities have developed programs to rehabilitate sewer connections affected by this issue.

For example, the City of Surrey decided to be proactive and took actions to address long-term problems that could emerge from poor sewer lateral connections. Confronting problems related to private sewer laterals can be challenging for local governments because these connections are located on the private property side. However, ensuring that these connections are well maintained can help avoid damages that could occur elsewhere in the community in the future. In Surrey, the assessment of sewer laterals has been included in the building permit management process. This means that sewer lateral inspections have to be conducted in the event of major renovation work on the property.

More precisely, if the sanitary sewer lateral has been in place for more than 30 years, an automatic replacement is required when a property owner submits an application for a building permit with construction value greater than $100,000 or when a parcel of land is being redeveloped. When a sewer lateral is less than 30 years old, a video inspection of the service connection must be completed. The mandatory sewer connection replacement program developed by the City of Surrey provides a simple way to address an issue that could significantly grow in importance over time.

The installation of backwater valves and sump pump systems can significantly reduce the risk of basement flooding from sewer backup. Over the past years, several Canadian municipalities have implemented by-laws and incentive systems to encourage property owners to install these devices. For example, the City of Ottawa introduced a by-law requiring the installation of a backwater valve on all new sanitary and storm sewer connections for both residential and commercial properties. Moncton created a pilot program to educate homeowners about backwater valves, weeping tiles and sump pumps and provided financial incentives for homeowners to encourage the installation of backwater valves. In addition to the rebates provided for the installation of backwater valves, Moncton City Council launched a program that was directed at homeowners who had been denied sewer backup coverage by their insurance provider. Under this program, homeowners who were ineligible for insurance coverage for sewer backup damage qualified for the installation of a backwater valve at no cost.

The different case studies presented in *Cities adapt to extreme rainfall: Celebrating local leadership* highlight the creativity of local leaders in their efforts to build flood resiliency within their communities. In order to build a successful adaptation strategy, local governments should develop good communication strategies, emphasize the importance of local actions, and promote the involvement of private homeowners in adaptation measures. While damage to homes caused by extreme rainfall events has been increasing over the last decades, it is important to remember that sewer backup and basement flooding is preventable.

The 20 cities selected by ICLR are among many other Canadian municipalities that have been proactive in developing adaptive programs to mitigate the impacts of severe rainfall events. The local actions presented in the book all have the potential to be replicated in other municipalities and will hopefully speak to other community leaders in the future.

Sophie Guilbault, M.Arch, M.Sc., is research coordinator for the Institute for Catastrophic Loss Reduction. The book Cities adapt to extreme rainfall: Celebrating local leadership can be downloaded on ICLR's website under the link: http://iclr.org/cities-adaptrain.html

APPOINTMENT

Paula Thomas

Claude Blouin and Jamie Dunn, Partners at Blouin, Dunn LLP, are extremely pleased to announce that Paula Thomas has joined the firm as an associate.

Paula earned an Honours Bachelor of Arts degree in History, English and Spanish from the University of Toronto in 1991, following which she spent a year teaching in Japan. After working for a number of years in marketing and recruitment, Paula decided to pursue a career in law and earned a certificate in Introductory and Advanced Interpersonal Mediation from St. Stephen's Community House in 2004. Paula obtained her LL.B in 2006 from Osgoode Hall Law School and was called to the Bar in 2007.

Paula articled and served as an associate lawyer at a full services law firm with a focus on charity and not-for-profit law. She then worked for several years at a well-known Toronto insurance defence firm before joining Blouin Dunn in 2015.

Paula has extensive litigation experience having appeared at all levels of court in Ontario as well as many successful appearances before the Animal Care Review Board. Her practice primarily focuses on insurance defence litigation, particularly in personal injury claims and occupiers' liability disputes. Paula's practice also involves municipal liability, sports, recreation and resort liability, property damage, Charter and other issues related to police liability.

Paula is a member in good standing of the Law Society of Upper Canada and a member of the Canadian and Ontario Bar Association and The Advocates' Society.

Paula's contact information is:
pthomas@blouindunn.com
(416) 365-7888 ext. 127

Blouin Dunn is one of Ontario's leading insurance defence firms whose members have been providing quality legal support to the insurance community for over 30 years. We offer services in Ontario to property and casualty insurers throughout North America, at all levels of experience, at appropriate and competitive rates.

BD

BLOUIN · DUNN LLP

Experience. Integrity. Results.

www.blouindunn.com