

Flood of Information

Edmonton residents are more likely than Toronto residents to mitigate future flood risk; not surprisingly, Edmonton has a more comprehensive basement flooding education program

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Editor's Note: This is the first installment of a two-part series on flooding risks in Canada. The second installment, which will run in our November 2007 edition, will include the author's impressions about the recent flooding in Calgary.



Earlier this year, the Institute for Catastrophic Loss Reduction (ICLR) surveyed more than 800 homeowners in Edmonton and Toronto to learn their views about basement flooding, particularly damages caused by sewer backup. We found that almost twice as many homeowners with recent basement flood damage in Edmonton have taken action to reduce the risk of future damage than in Toronto. Results from the study revealed the proactive and comprehensive basement flooding education program run by the city of Edmonton may be a primary reason for the increased level of mitigative action in that city. Clearly, education programs can be powerful tools to control insurance loss claims.

SEWER BACKUP DAMAGES

Sewer backup damages in Canadian municipalities cost governments, homeowners and insurance companies millions of dollars every year. For example, the Insurance Bureau of Canada estimated two heavy rainfall events in Edmonton in July 2004 resulted in Cdn\$143 million in sewer backup insurance payouts, and an extreme rainfall event in August 2005 in the Greater Toronto Area resulted in

Cdn\$247 million in insurance payouts for sewer backup damages. An extreme rainfall event in July 2004 in the city of Peterborough, Ontario resulted in Cdn\$87 million in insurance payouts.

Many other cities in Canada are subject to recurring urban flooding events, causing damages from both overland flooding and sewer backup. A 2002 report commissioned by ICLR, authored by E. N. Allouche and P. Freure of the University of Western Ontario, revealed that out of 26 municipalities surveyed nationwide, 42% reported basement flooding occurred several times per year and 92% reported that basement flooding occurred at least once every several years within their jurisdictions.

Unfortunately, the risk of damages caused by basement flooding is expected to increase. Expanding urbanization, continued deterioration of sewer infrastructure and a lack of municipal financial capacity to adequately monitor, maintain and upgrade sewer systems will enhance the risk of urban flooding. Furthermore, extreme rainfall events that often cause urban floods are expected to increase in both frequency and intensity as a result of climate change.

CAUSES OF SEWER BACKUP

Sewer backup is the result of sanitary sewer surcharge, which occurs when excess, unwanted water enters sanitary or combined sanitary/storm sewer systems. A surcharge can force sewage into lower levels of houses through connections to the sanitary sewer system, such as toilets, floor drains and sinks.

At the level of municipal infrastructure, unwanted sources of water in the sanitary system may be caused by:

- infiltration and inflow, in which ground water or storm water enters sanitary systems through cracks in pipes, misaligned joints and cross connections with storm sewer systems;
- improperly-sealed manholes or deterioration of manholes, contributing surface water to the sanitary system, and;
- other sources of stormwater in sanitary sewers, such as parking lot storm drain connections.

Combined sanitary and storm sewer systems, which convey both storm water and sanitary sewage (and service the older parts of most Canadian cities), also increase the risk of sewer backup flooding.

Homeowners have an important role to play in increasing or reducing the risk

of sewer backup. Studies in several Canadian municipalities have identified eaves trough downspout and foundation drain connections to sewer systems as significant sources of unwanted water. The combination of deteriorating infrastructure, private contributions of storm water to the sanitary system and the existence of combined sewer systems creates and enhances sewer backup risk in many Canadian municipalities.

HOMEOWNERS' MITIGATION TECHNIQUES

In a perfect world, every municipality would have separate storm and sanitary sewer systems that are maintained and updated where necessary, eliminating all sources of unwanted water from the sanitary sewer system. In reality, municipalities often lack the financial capacity and political will to maintain adequately and upgrade sewer infrastructure; in addition, they lack the resources to enforce regulations that require the disconnection of down spouts and foundation drains.

Homeowners have a variety of adjustment options available to them that can directly reduce the risk of sewer backup damages in their home. Risk-reducing actions for sewer backup may include:

- installing a backwater valve;
- installing a sump-pump;
- detaching the foundation drain from the sanitary sewer; and
- disconnecting eaves trough downspouts from the sanitary sewer.

In some cases, homeowners choose to take actions that involve changing the way they use their homes, such as leaving their basements unfinished or removing valuable items from their basements.

BASEMENT FLOOD EDUCATION PROGRAMS

Many municipalities in Canada, including Edmonton and Toronto, employ education programs to increase awareness and encourage homeowners to take actions to reduce the risk of sewer backup damages.

Effective hazards education is a complex process; properly implemented, it can lead to increased hazards awareness and adoption of adjustments. Previous research reveals that formalized education programs providing ongoing and long-term information from a variety of sources and through a variety of channels

— and which provide information in a timely fashion following hazard events — can increase individual awareness of hazards and increase the adoption of risk-reducing adjustments.

Edmonton has employed a formalized basement flooding education program over the past several years. It includes ongoing public meetings, information mailings, professionally designed and printed information brochures, Web sites and handbooks, and has provided public basement flood prevention workshops in order to increase knowledge of specific basement flood mitigation tools (such as sump-pumps). Edmonton also has a long-term and formalized preventative plumbing subsidy program, which provides financial assistance for the installation of preventative measures such as backwater valves.

Toronto also employs a basement flooding education program, which includes several components of Edmonton's homeowner education program. However, at the time of the ICLR survey, Toronto's program lacked the long-term nature and formality of Edmonton's program. Toronto is currently working to develop a more formalized basement flooding education and subsidy program.

PERCEPTIONS AND MITIGATION

Relatively few respondents enduring damages from sewer backup in Edmonton (35%) and Toronto (33%) believed they would sustain sewer backup damages again in the future. Furthermore, respondents in both Edmonton and Toronto placed an overwhelming amount of the responsibility for damages caused by sewer backup on their municipal governments.

The study revealed a relatively high rate of adoption of at least one risk-reducing adjustment. Seventy-two per cent of Edmonton homeowners and 60% of Toronto homeowners who had sustained damages in the past reported adopting at least one adjustment. However, a much smaller proportion of respondents adopted some of the more effective adjustments. For example, only 35% of Edmonton homeowners and 18% of Toronto homeowners who had previously had sewer backup damages installed backwater valves. Sump-pumps were rarely

installed: only 20% of Edmonton respondents said they installed them, whereas 8% of Toronto respondents reported making this adjustment.

Survey results show respondents falling into two distinct camps. The first (and largest) category includes homeowners who believe they will never sustain damages again in the future. The second is made up of homeowners who have taken the most effective risk-reducing adjustments, including installation of backwater valves. If homeowners are to become more involved in mitigation of sewer backup hazards, they need to be aware that if they have sustained sewer backup damages in the past and have not taken appropriate risk-reducing actions, they may have a good chance of sustaining damages again in the future. Also, homeowners should be made aware that they share responsibility with the municipal government for both sewer backup damages and damage mitigation.

As discussed above, individuals can reduce the risk of sewer backup by eliminating extraneous sources of water from sewer systems, including disconnecting their eaves troughs and foundation drains from the sewer system. Twenty per cent of Edmonton homeowners and 16% of Toronto homeowners who had suffered previous damages reported detaching their foundation drains from the sanitary sewer; 41% of Edmonton homeowners and 36% of Toronto homeowners reported disconnecting their eaves trough downspouts from the sanitary sewer. These numbers are encouraging, but much work still needs to be done.

INSURANCE COVERAGE

Sewer backup coverage is optional. Therefore, homeowners may have to request specifically that sewer backup damages be covered in their home insurance policy. This type of coverage is generally accompanied by a small increase in a homeowner's insurance premiums.

ICLR's study revealed that 61% of Edmonton homeowners, and 45% of Toronto homeowners who had suffered damages had insurance coverage for sewer backup damage. Interestingly, 33% of homeowners in Edmonton and 38% of homeowners in Toronto who had suffered sewer backup damages did not know whether or not their insurance policy included coverage for sewer backup.

For the small proportion of respondents who suffered sewer backup damages and did not have insurance coverage, the most popular reason cited for not having coverage was the belief that it would significantly increase their insurance rates. The second most popular reason cited for not having coverage was a lack of awareness that sewer backup coverage was available. Very few (seven out of 805) respondents reported that their insurance companies had cancelled their sewer backup coverage.

Only 37% of Edmonton homeowners and 32% of Toronto homeowners reported filing an insurance claim for damages caused by sewer backup during their most recent sewer backup event. Statistical testing revealed that homeowners who perceived their most recent damages as severe or very severe were far more likely to file a claim than homeowners who perceived their damages as minor or very minor.

Of the 74 respondents from Edmonton who claimed insurance for their most recent sewer backup damages, 82% were either satisfied or very satisfied with the way the insurance company handled their claim. Similarly, of the 63 respondents from Toronto who filed an insurance claim, 75% were either satisfied or very satisfied with the way their insurance claim was handled.

DIFFERENCES: EDMONTON AND TORONTO

Several differences were found between the Toronto and Edmonton populations. Edmonton homeowners who had suffered sewer backup damages, for example, were more likely to have adopted at least one risk-reducing adjustment, and were more likely to have installed backwater valves and sump-pumps.

As discussed above, both Edmonton and Toronto have employed education programs to increase awareness of basement flood hazards and flood mitigation techniques. However, Edmonton's education program is considerably more progressive and comprehensive. Differences in the adoption of risk-reducing adjustments between Edmonton homeowners and Toronto homeowners are, at least in

part, a result of Edmonton's more progressive education program. Indeed, Edmonton homeowners (28%) who had previous sewer backup damages were twice as likely to have attained information on how to mitigate their risks from their municipal government as Toronto (14%) homeowners.

INSURANCE INDUSTRY AND EDUCATION

Sewer backup damages in Canadian municipalities will increase as cities grow, as sewer infrastructure continues to deteriorate and as the frequency and severity of heavy rainfall events increase as a result of climate change. Since municipalities will be unable to maintain and upgrade sewer system infrastructure at the needed



rate, homeowners will have to become more involved in the mitigation of basement flooding risks. Despite the already significant costs of sewer backup damages (and the potential for an increase in these damages), homeowners appear to be largely unaware of their risks and responsibilities; they are generally unwilling to adopt risk-reducing adjustments.

Basement flooding education programs can increase the awareness of basement flood hazards and the adoption of mitigative adjustments, thus reducing damages and insurance payouts. Effective hazard education programs should be formalized and provide ongoing, long-term information from a variety of sources.

One way the insurance industry can help to reduce basement flooding is by working with municipalities to develop hazard education programs for basement flooding. Insurance industry involvement can add salience to existing municipal programs by acting as an additional source

of information for homeowners on both the nature of sewer backup hazards and on mitigation methods for this hazard.

Insurance companies should work to increase awareness and education about insurance, specifically insurance coverage for sewer backup. As noted in this study, a considerable portion of sewer backup victims did not know whether or not their insurance policy covered sewer backup damage. As well, the most popular reason respondents cited for not having coverage was the belief that sewer backup coverage would significantly increase their insurance premiums. Although it is true that additional coverage will increase homeowners' rates, homeowners should be made aware that the rate increase would be marginal — usually adding no more than \$30 to \$40 to the average home insurance premium. As well, insurance companies should work to ensure homeowners are aware that this type of coverage is available.

It is important to note homeowners are generally satisfied with insurance as a means of recovering from damages. In this study, as in many studies similar to this one, homeowners reported a general satisfaction with the way their insurance claims were handled, even if they received no payout. This contrasts with the dissatisfaction homeowners often express in association with government relief programs, which are often bogged down in bureaucracy and provide coverage only for the basic necessities following a disaster event.

ONGOING WORK

ICLR is working to increase the resilience, sustainability, vibrancy and prosperity of Canadian municipalities through its RSVP...cities program. The goal of the program is to increase natural hazard resilience and reduce deaths, injuries and damages caused by natural hazards in Canadian municipalities. As part of the program, ICLR is working to increase knowledge of urban flood risks, and will work to develop a practical how-to manual to assist Canadian municipalities in the development of effective urban flooding education and mitigation programs. 