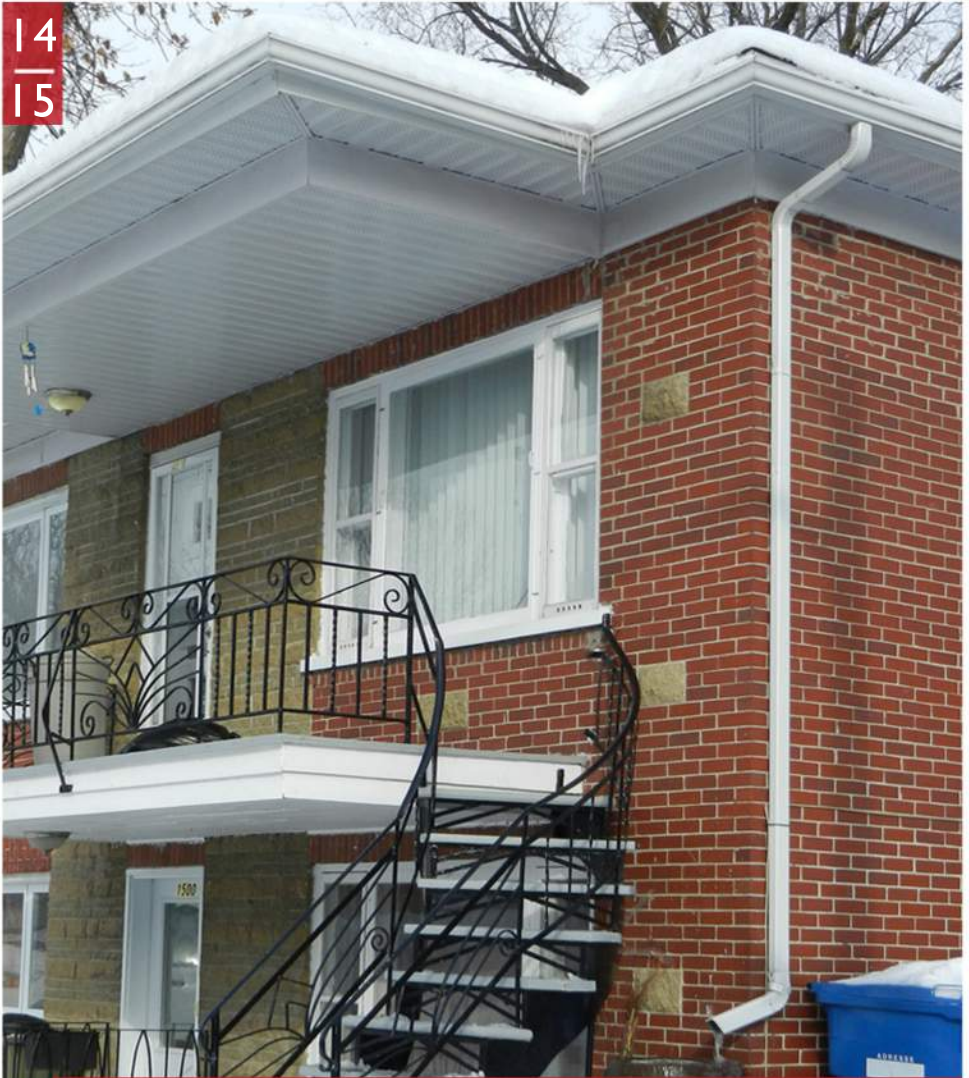


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QUEBEC CITY

Persistent communication to
homeowners

Source: ICLR

THE SCIENCE

Property owners can and should be significant participants in efforts to reduce the risk of damage to homes from severe weather. Many practices that homeowners should follow, like disconnecting downspouts, are inexpensive and relatively easy to implement. Nevertheless it remains a considerable challenge to involve property owners in retrofit programs. Often, efforts by local governments to involve property owners are constrained by legal issues, like limits to the power of municipal officials to compel action on private property.

Local government officials consistently express concerns about the challenges associated with effective communication with property owners and other stakeholders. What information should be shared? What is the best timing? Who should write on behalf of the City? Some actions to protect homes against the risk of damage from extreme rainfall are technical and require professional implementation. Some actions are costly in terms of the equipment required and time involved. Some actions provide direct benefits to an individual homeowner while others provide benefits shared across a neighbourhood. Best practices to influence behaviour remain an approach with increasing support from local governments willing to share their experience.

THE TRIGGER

Maizerets is a neighbourhood enclaved in Québec City's Limoilou district. Developed mostly at the beginning of the last century, it is a neighbourhood served by a combined sewer system. The topography of the area has some parts of the neighbourhood located on higher ground and some in low-lying areas, resulting in stormwater accumulation, causing basement flooding. The neighbourhood is also located on the banks of the St. Lawrence River where a tide gate has been installed. Under normal conditions, the tide gate prevents water from backing up into the system from the St. Lawrence River. However, it does increase the risk of flooding during extreme rainfall events.

THE APPROACH

Faced with frequent basement flooding, the City conducted several studies to identify the elements contributing to the problem. It found that 373 out of 623 pitched roof houses had gutters connected to the foundation drain, which meant that roof rainwater was directly entering the combined sewer system. This connection went against municipal regulations and was unnecessarily overloading the system when it rained. The City launched a program in 2005 to fund downspout disconnections for the 373 households.

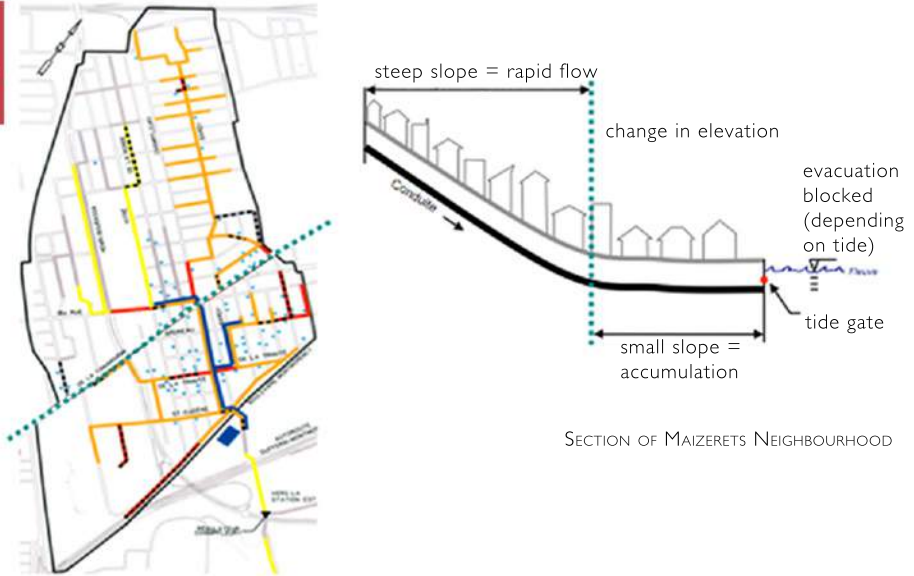


Figure 4: The map and section presented above highlight the vulnerability of the Maizerets neighbourhood to sewer backup. Since the neighbourhood is located at the bottom of a steep slope, the water tends to accumulate in the low-lying area. A tide gate located on the bank of the St. Lawrence River also contributes to the neighbourhood's vulnerability. This device is an opening through which water can flow freely when the tide flows in one direction but which closes automatically and prevents the water from flowing in the opposite direction. In the Maizerets neighbourhood, the tide gate prevents stormwater from being directed to the river during high tide.

(Source: Quebec City)

THE OUTCOME

Since all of the downspouts in the neighbourhood were on private property, Quebec City needed to encourage property owners to participate. The first letter from the City provided an explanation as to why disconnection was important for the neighbourhood and offered to cover the full cost of disconnection. One quarter of homeowners agreed to participate.

Seeking higher compliance, the City decided to make the program mandatory. The City wrote again to targeted homeowners explaining the importance of the program, that the City would cover the costs of disconnection, offered a free rain barrel and noted that compliance was mandatory. Almost 60 percent of the outstanding homeowners agreed to participate when the program became mandatory.

The City wrote five more times to reluctant homeowners stressing the value of disconnection to the neighbourhood and warning that a \$300 fine may be imposed for non-compliance. Ultimately 100 percent of the targeted homeowners participated in the program by early 2008, about three years after the program was launched.

Securing 100 percent compliance required a persistent public awareness campaign that ultimately required seven letters and two brochures. Further, this campaign utilized increasingly senior officials and a shift from incentives to coercive measures. In addition to the downspout disconnection program, other mitigation measures were also undertaken by the City that incorporated stormwater retention systems in public parks and parking lots.

Quebec City invested \$100,000 in the downspout disconnection project and \$25 million for the construction of a retention tank and renovations to the sewage system. The City estimated that the measures to encourage disconnection by homeowners allowed the City to build a smaller retention tank, saving about \$500,000. Flow regulators were also installed in parks and parking lots around the neighbourhood. Replacing the combined system with a separated system would have required a significant investment that the City was not able to make. However, the City increased the capacity of the system and approved a new standard commonly used elsewhere in the City.

By increasing citizens' awareness, enforcing regulations and investing in the repair or construction of new infrastructure, the City was able to significantly reduce the risk of basement flooding in Maizerets.

A WORD FROM QUEBEC CITY

Manuel Parent, Urban Infrastructure Engineer for Quebec City stressed the importance of explaining to homeowners how connected downspouts can increase the risks of sewer backups and why this connection goes against municipal legislation. He further stated that City representatives should make sure that necessary retrofits and costs are explained, and ideally present the program as a turn-key project funded by the City. Communication with homeowners should be from senior officials and ideally no more than three letters should be sent.

If he had to go through the process again, Mr. Parent said he would "use the first letter as a non-compliance notice explaining to homeowners that their downspout connections go against municipal legislation and that they have 30 days to conform or a \$300 fine could be imposed. The second letter would include an additional 30 day deadline and inform that a \$300 fine will be imposed after that point. Finally, the third letter would inform homeowners that they have to pay the fine unless they immediately register in the disconnection program. It is important to start by promoting citizens' participation instead of presenting the program as a constraint," said Mr. Parent.