

Workshop – Co-constructing knowledge for urban resilience implementation

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The Challenge Posed by the Horizontal Integration of Urban Resilience in Montréal

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1-Introduction :

Montréal's Bureau de la résilience (resilience office) was created in May 2016 with a mandate to develop a resilience strategy for Montréal as part of the 100 Resilient Cities (100RC) program put forward by the Rockefeller Foundation. The city's Centre de sécurité civile (CSC) played a central role in this initiative. The Bureau's development strategy is largely based on 20-year collaboration aimed at pooling the efforts of Montréal's emergency and risk management stakeholders.

Through the Bureau, the city, in the coming years, intends to broaden its expertise when it comes to prevention and risk management. Its analysis will cover the shocks that could present a threat to Montrealers' health and safety, but also the chronic stresses that can affect the city's ability to deal with disturbances if and when they occur.

Montréal has largely been spared any major disasters over the past 375 years, particularly compared to other major cities across the world. Until this spring's flooding events, the 1998 ice storm stands as the greatest shock experienced in Montréal's recent history. That said, events of a lesser magnitude (extreme weather events, drinking water contamination or infrastructure failure) come along, at times, to disrupt the health and safety of Montrealers. The Lac Mégantic (Québec) disaster of July 2013 served as a chilling reminder of the importance of preparation. The accident – which occurred 250 km from Montréal – sparked considerable concern about the risks associated with the transportation by rail of dangerous goods in urban environments.

Since the 1998 ice storm, several mechanisms – not least the creation of the city's Centre de sécurité civile – have been put in place to ensure the safety of citizens and prevent the consequences of such disasters. This event also led to the 2001 adoption of the first province-wide Civil Protection Act (*Loi sur la sécurité civile*) in Québec. This law directed municipalities to develop a better knowledge of the hazards and vulnerabilities to which they're exposed, improve prevention programs, and establish forecasting and advance warning systems.

This involves collaboration with a great many stakeholders within the municipal administration, but also with external partners, including first responders and emergency and health services providers, government representatives, and critical infrastructure managers. All have a role to play in risk prevention and management. The CSC has fostered strong and sustained

collaborative ties with these stakeholders through various initiatives (presented below), which has helped to bridge some important administrative and hierarchical silos.

Other stakeholders, particularly in the economic, social and environmental fields, have remained on the sidelines when it comes to risk management, however. In regards to urban resilience, the need for stakeholder buy-in to address Montréal's chronic stresses and potential shocks is much more far-reaching.

Above and beyond shocks, a number of stresses exert a significant impact on the well-being of Montréal's population, both on a day-to-day basis and in emergency situations. Poverty, inequality, lack of access to clean and affordable housing, aging infrastructures, road congestion, climate change — all these factors can impact the lives of Montrealers. Plans and strategies have been put in place to respond to these challenges, and the city is actively working to improve living conditions for its citizens. Montréal also boasts a number of advantages, not least the safety of its streets and neighbourhoods and the current vitality of its economy and its cultural and R&D sectors. These positive developments bely underlying vulnerabilities, however. As is the case elsewhere in Canada, Montrealers are turning to food banks in greater numbers, while unemployment among immigrants and visible minorities remains high. These stresses can affect a city's ability to deal with shocks if and when they occur.

Bringing together stakeholders from all these sectors has been and remains a challenge for Montréal's resilience team. That said, building on past work and drawing on lessons learned from the CSC team has helped bridge silos and move the resilience agenda forward. But more has to be done.

The 100 Resilient Cities network recognizes the importance of developing Montréal's capacity to offer more than emergency response, particularly in the economic and social spheres. Efforts must also be made to better understand the connection between shocks and stresses in Montréal. This has to be done in a collaborative way by cutting across administrative and organisational silos, which in turn could promote greater learning capacity on the part of the city and Montrealers, thus making it possible to better target future actions as well as prevention and risk mitigation activities. These are just some of the challenges Montréal will be called upon to meet as it develops its urban resilience strategy.

2-Lessons learned from the Centre de sécurité civile

Montréal's urban context

Montréal is a complex city. It has 19 boroughs and offers services across the island of Montréal, including in 14 reconstituted cities. Together, all the boroughs and reconstituted cities form the agglomeration of Montréal. City council, the city's chief decision-making body, is composed of 65 elected officials. The agglomeration council, headed by the mayor of Montréal, is made up of 31 elected officials from Montréal and the reconstituted cities. These cities also have their own municipal councils headed by their respective mayors. This division of powers renders decision-making far more complex and weighs down administrative processes. More specifically,

Montréal boroughs use their respective budgets to administer land use planning, drinking water distribution, and the cleanliness of public spaces. A governance review involving a centralization of certain powers in favour of the Central City may represent a solution to this cumbersome administration. Repatriating specific powers would make it possible to advance a unique and coherent vision of the city in terms of taxation, financing stability and predictability, equity and performance through best practices, as well as lower costs and economies of scale. In 2015, for example, the Central City repatriated snow removal powers for local road networks, and the municipal administration adopted a new policy calling for minimum operating standards for snow removal on public roads so that citizens in all boroughs receive equivalent services, which was not the case prior to 2015.

Moreover, Montréal recently succeeded in securing the status of Metropolis from the Government of Québec. With the recognition of this status, the government will lend Montréal greater powers and responsibilities, to go along with additional financing sources that will allow the city to fully assume its role as a 21st century metropolis. The city's expectations revolve around a recognition of Montréal's expertise in the fight against homelessness and street work and in the provision of psychosocial and housing support — areas that require stable financing together with a concerted and multi-sector approach.

Collaborative efforts in risk prevention and emergency management

Efforts to implement a concerted and multi-sector approach to risk prevention and emergency management have been underway for many years in Montréal, with the CSC team tackling head-on the different organizational cultures within the city administration and in its boroughs and reconstituted cities. Chief among them has been the effort to develop its *Plan de sécurité civile de l'agglomération de Montréal* (civil security plan) and its *Plan de missions locales* (local mission plan). These collaborative efforts have also given rise to an annual awareness and alert siren test campaign for industrial risk.

Across these three initiatives, defining a strong common vision and a collaborative working process has been at the heart of the CSC's work.

***Plan de sécurité civile de l'agglomération de Montréal* (Civil security plan for the agglomeration of Montréal)**

The Plan de sécurité civile de l'agglomération de Montréal (PSCAM) was produced after the January 1998 ice storm and in response to the 2001 Civil Protection Act adopted by the Government of Québec. It sets out the roles and responsibilities of all responders within the city administration and the coordination of emergency situations.

From the outset, a "missions approach" was taken. This approach consists of assigning specific tasks (law and order, safety of life and property, health, logistics, communications, critical infrastructure, etc.) to a city department or governmental partner, with the tasks assigned to

the most logical sectoral representative; the role of the task responder is much larger than the city department or governmental organization it represents, however.

The task responder, in an emergency situation, must be able to break away from administrative structures in order to take on a more inclusive and active role. And while this approach has its challenges, it has proven highly efficient in emergency situations. It represents the first important step by the CSC to bridge some important jurisdictional and administrative silos in Montréal.

This approach has also given rise to an ongoing reflection on roles and responsibilities within the city and on shortcomings in some of its administrative processes, notably human resources. Discussions between the CSC and the city Human Resources Department are aimed at more clearly defining the accountability of senior staff in support of the PSCAM and the task responders' ongoing training requirements.

In this regard, a city-wide training program has been developed in connection with PSCAM tasks and coordination processes. This training program provides basic civil security information as well as more hands-on training to staff that, for the most part, do not have any professional experience in emergency management. This is a challenge for the CSC team, both in terms of outreach and awareness-raising within the municipal administration.

On the other hand, some senior staff have dealt with emergency situations in the past and as a result are less inclined to participate in training activities and more resistant to procedural changes. Some responders, as keepers of this knowledge within their respective organizations, are reluctant to share their knowledge and experience gained through years of work. In these cases, CSC staff have worked to develop incentives to collaborate by focusing on shared gains.

Montréal's facilitative leadership, in recent years, has been instrumental in getting this training program off the ground in city departments and with senior staff. The issue of risk, in Montréal, is now spoken about with greater transparency. Past events and numerous disturbances in water and transport infrastructures, in particular, have helped build awareness by highlighting the importance of preparedness. The PSCAM process consolidated this awareness and the importance of a collective and proactive collaboration to better respond to emergency events.

Plan des missions locales (local emergency plans)

An important part of the PSCAM is the *Plan des missions locales*, the emergency plans developed by all 19 boroughs and the 14 reconstituted cities. Between 2006 and 2010, all were required to prepare one such plan, with mixed results in terms of quality. Keeping the information updated was an important challenge at the local level.

In 2009-2010, in order to further heighten interest in and recognition of emergency management at the local level, the CSC initiated a civil security tour in all the boroughs and reconstituted cities. Another CSC initiative intended to facilitate collaboration is the systematic

sharing of yearly assessments of local emergency plans with the concerned borough or reconstituted city. This 2011 initiative sparked mixed reactions, both good and bad, to sharing the reports with the SCS, though ultimately the dual initiatives served to bring about a recognition of the CSC team's work and expertise. At the same time, a clear need for support in the development and updating of the *Plan des missions locales* was expressed.

This collaboration has proven highly constructive for the city as a whole. As of 2016, most of the plans are well advanced, and some important civil security lessons have been passed on locally. Of course, not all boroughs and reconstituted cities are as proactive. Some contend with frequent organizational changes, which hinder corporate memory. Some have experienced previous local emergency situations that have influenced their initial positive response to the CSC recommendations. Other boroughs have faced pressure from their constituents to develop their own emergency plans. Some count on strong local leadership in this area, or simply have more resources than others.

The latter element has proven important in supporting collaboration in emergency situations. During last spring's historic floods in the northwest sector of the island, the downtown borough of Ville-Marie was actively involved in emergency measures, lending most of its available resources to the smaller boroughs and reconstituted cities impacted by the floods. Having a well developed emergency plan and important resources has made that possible.

In the past few years, some boroughs and reconstituted cities have been included in tabletop exercises with various industry and community stakeholders. And starting in 2018, an online tutorial on basic civil security notions will be made available to all city personnel with the objective of further developing a risk culture in city administration connected to the Resilience Strategy Action Plan.

Yearly awareness and alert siren test campaign for industrial accidents

In Montréal, as in many large cities, industries straddle residential areas, thereby increasing the risk in the event of a major industrial accident. For this reason, the city works closely with industries that use hazardous materials in order to mitigate the risks associated with a major industrial accident involving toxic gas.

In 1995, a collaborative effort was initiated in a highly industrialized and sensitive area of the island of Montréal. A first CMMI (comité mixte municipalités-industries / Mixte municipal-industry committee) was created with the Montréal-Est, Mercier-Hochelaga-Maisonneuve and Rivière-des-Prairies-Pointe-aux-Trembles boroughs and local industrial partners. The CSC and the Montréal fire department also partnered with the CMMI, and, following the adoption of the Canadian Environmental Protection Act (CEPA) in 1999, a dynamic public awareness campaign was created in 2003-2004. It was against this background that a collective effort was made to better frame this risk in Montréal and quickly alert local citizens in the event of a hazardous materials accident.

In 2005, alert sirens were installed in two local industries known to use toxic products. These sirens were linked to a central control reception system directly connected to the fire department, the 911 emergency centre, and a radio-activated message on local radio stations. A first siren test was held in December 2005, and other industries soon followed suit. A tenth industry recently joined the initiative, and a yearly awareness and alert siren test campaign, coordinated by CSC personnel, has been held since 2012. Now in its fifth year, the campaign actively involves industry, first by explaining the federal legislation and answering questions concerning the obligation to prepare an Environmental Emergency Plan. Second, the campaign strongly encourages risk generators to install an alert siren in their buildings, and third, it secures their participation in the annual awareness and siren test campaign.

This initiative has not always been easy to enforce. The federal legislation remains vague in some important aspects, notably the obligation on the part of industry to install an alert siren. For city representatives, therefore, asking for more than what is imposed under the Canadian Environmental Protection Act poses a continued challenge. But Montréal's experience in dealing with the consequences of a major industrial accident has helped change the way things are done in the city.

Another challenge lies in technological development. A general review of existing tools and future perspectives for this initiative is underway at the CSC. Tools to communicate and alert the population have changed drastically over the last 10 years. New collaborative efforts must be developed to further promote this new trend, both with the provincial and federal governments.

That said, a strong collaboration now exists between the CSC team and some of the main risk-generating industries within city limits. Some major multinational industries were reluctant to participate in this initiative at first, mostly because of the risk it posed to their reputation. In some circles, however, this reluctance was perceived as a refusal to participate, particularly in instances where an industry competitor had agreed to do so.

Challenges remain when it comes to collaborating with small and medium-sized enterprises (SMEs) storing less than the required quantities of hazardous products included in the federal registry. These SMEs still present a risk for the safety of local populations. In order to respond to this legislative gap, municipal legislation is currently being developed with all concerned municipal departments and industrial risk specialists. Discussions are also underway with federal representatives with the goal of better coordinating the municipal and federal response.

Bureau de la résilience efforts to bridge the gap between silos

These three CSC initiatives, and others over the years, have provided a solid basis upon which to advance further collaborative efforts in Montréal. The CSC team has developed capacity in coordinating and connecting experts within and outside the complex municipal administration. They benefit from data and knowledge held by these stakeholders and city departments.

As part of the resilience strategy currently under development, new collaborative efforts have drawn on this capacity. An effort has also been made to go beyond emergency management stakeholders in a bid to address some of the main stresses closely connected to Montréal's resilience, both on a day-to-day basis and during a shock. The Bureau de la résilience's positioning within the city administration is meant to make it easier to benefit from the CSC experience and leverage departmental knowledge and strengths. Although the Bureau de la résilience is under the jurisdiction of the Adjunct Director General's office for quality of life, and the CSC remains under the jurisdiction of the Montréal fire department, both teams are led by the city's Chief Resilience Officer (CRO), Louise Bradette, who also serves as Director of the Civil Security and Resilience Department.

The creation of the Bureau de la résilience speaks to an organizational transformation that's changing the power dynamics at the city: rather than develop ad hoc projects to manage cross-departmental issues, the CRO earned legitimacy by reflecting strategically on issues covered traditionally by other departments (e.g., environment, vulnerable populations, economic development). This legitimacy was gained through the acknowledgment, by the mayor of Montréal, of the central role resilience must play in decision-making so as to better prepare its administration and all Montrealers to face the growing physical, social and economic challenges of the 21st century.

What's more, a new network of partners emerged as a result of this transformation. Instead of soliciting support solely from the emergency community, the Bureau de la résilience followed the 100RC process by inviting a broad spectrum of stakeholders to play a part in identifying the priorities that should be addressed under Montréal's Resilience Strategy. Following the agenda-setting workshop in January 2016, some 100 participants from various Montréal organizations were divided into four working committees:

- Diversity and social equity
- Urban Infrastructure and public utilities
- Prosperity and innovation
- Quality of living environments

The four committees met with the Bureau de la résilience team in June and September 2016, and individual meetings were also held throughout the project development in 2017. A steering committee was also created to support the strategic development of the Resilience Strategy. This committee was composed of 28 influential members of the Montréal community and the municipal administration.

The ensuing meetings helped identify some important challenges that lie ahead for the Bureau de la résilience as it works to support the horizontal integration of urban resilience within the municipal administration. First, a common understanding of the concept and what resilience represents for Montréal remains difficult to communicate. While there is a general consensus on the need to adapt our behaviour and practices, the concrete application of the principle

remains unclear to some, or very restrictive to others. This may explain why environmental and social stakeholders and critical infrastructure representatives were much more inclined to participate initially in the strategy's development, compared to their counterparts in the business community. There is a will to integrate resilience in land-use planning, social and economic development, climate change adaptation and environmental protection, but truly understanding its added value and making it a concrete part of city decision-making is no small feat. This far-reaching concept has been a buzz word for a few years, but only now has it begun to change the way things are done in Montréal.

Recent events have helped highlight the added value of resilience for the city. Such was the case, in particular, with the Economic Development Department, which was reluctant, at first, to participate in resilience strategy building. The impact of the spring floods on local businesses fostered a renewed sense of purpose and understanding within this city department, however. A first economic response plan to the flooding was prepared during the event. This followed an organizational change at the head of the department, one that sparked further interest in joint projects in the economic field meant to support resilience-building in Montréal, notably in business continuity with public and private partners.

Resilience thinking also inspired a CSC internal recommendations report in response to the spring floods. This report promotes changes in all four phases of risk management at the city: prevention, preparation, response and recovery. It follows a debrief meeting in June 2016 with all city departments involved in the spring flooding, and represents an important collaborative effort to understand how the event was handled, the recovery phase, but more importantly the lessons learned and the future mitigation measures that must be developed in order to build Montréal's collective resilience capacity to deal with the risk of flooding. Mechanisms facilitating collaboration, such as agreeing on shared facts and data, and procedural and institutional arrangements, not least a commitment to process, will determine whether resilience will well and truly be integrated into municipal decision-making in the future. Better embedding risk analysis in land-use planning will be one concrete way of promoting this through the Resilience Strategy.

The potential administrative change in the strategic positioning of the Bureau de la résilience and the CSC team will also be an important element sure to facilitate the horizontal integration of resilience in the months and years ahead. There is strong municipal support, currently, for renewed risk and emergency management practices and the 100RC initiative. But support in the form of added authoritative measures and concrete actions and resources will be required to move the urban resilience agenda forward.

Important collaborative efforts are under discussion with the Social Diversity and Sports Department, particularly on the issue of community resilience and urban security, food security and vulnerable populations. The resilience team will be collaborating on the action plan put forward as part of its new social development policy, which in turn is integrated into the

Resilience Strategy. Collaboration between the two teams has been achieved through shared understanding and the identification of common problems and values. Much remains to be done to identify concrete projects, with persistent challenges stemming from embedded daily routines and organizational practices, the survival of routines, and the protection of resources. This is the case, in particular, with the urban security field, which could be fertile ground for a renewed vision that includes social capital and community resilience efforts.

Integrating academic and community stakeholders in a useful and relevant way is also a challenge. In-house expertise exists within the city administration, but outside knowledge and know-how is also important in order to renew thinking and decision-making within the city context. The city, on many occasions, has collaborated with these two communities, and they remain important partners in the development of the Resilience Strategy. This connection between scientific evidence and lay knowledge needs to be maintained and strengthened.

Conclusion

The implementation of urban resilience in Montréal, in collaboration with the main municipal stakeholders, is well underway. Slowly but surely, the added value of resilience thinking is being communicated and demonstrated. Short-term results will be essential to this ongoing process, as will strong and long-term collaborative efforts. In this context, breaking silos will remain a challenge. Building bridges will be a more realistic means of promoting resilience within the municipal administration.

Resilience is not a stand-alone concept. It is complementary to social and economic development, environmental protection and risk management. Through this connection to the well known concepts of public security and sustainable development, its added value can only be demonstrated with the help of concrete projects supported by scientific evidence. This knowledge must be easily accessible and understandable to public authorities. This remains an important challenge, one that the scientific community needs to address.

Cost-benefits analysis will also be necessary in order to persuade public authorities and the business community to invest in preventive measures based on resilience thinking in fields as wide and far-reaching as land-use planning, economic development and urban security, for example. The added value of resilience has a cost, and that cost, whether economic or social, must be proven to be acceptable and necessary in the short and long run.