

Collaborative Resilience in Critical Infrastructure and Crime Prevention: A Discussion Paper

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Introduction

Large and catastrophic events – especially when they are unforeseeable – are difficult to plan for, learn from, prepare for, and protect against in our daily lives (Cox, 2012:1919). However, although this may be true, it remains that disasters and crises of all sorts occur regularly, in Canada and beyond our borders that are increasingly permeable and malleable. In Canada, communities, provinces, and the federal government all have a duty to collaborate and coordinate when it comes to policymaking and governmental intervention, in order to best protect against all events that can negatively harm and endanger the safety and functioning of Canadian societies. As well, the various levels of government can greatly benefit from the private sector and community programs that have the expertise and the resources to increase preparedness and resilience when it comes to emergencies and crises, whether they are manmade or natural. In order to stimulate a conversation between all of the involved stakeholders, you are all invited today to participate in this workshop that will focus on exploring and elaborating new models for creating resilience and preparedness in the Canadian context of multilevel governance and collaboration. As a guide, this discussion paper seeks to provide an introduction and foundation for those that do not have advanced knowledge of the concepts of vulnerability, resilience, and preparedness along with collaboration and multilevel governance, specifically in critical infrastructure and crime prevention.

Our analysis and findings are mostly based on a literature review, and we seek to provide you with some fundamental information, up to date research, and important questions. Our main argument is that it is important to invest in preparedness and resilience in critical infrastructure and crime prevention, and that these two areas overlap and are of great interest to everyone, especially individuals and communities. In order to achieve preparedness and resilience, collaboration (between public actors, private actors, and civil society) and multilevel governance (between all of the levels of government, especially local governments/municipalities) are important.

This discussion paper will first outline the definition and a few factors that contribute to vulnerability. Subsequently, resilience and preparedness in crime prevention and critical infrastructure will be explored. Finally, the need for multilevel governance and collaboration in these areas will be developed.

1. Vulnerability

According to the existing research, the concept of vulnerability has two dimensions. The first is physical vulnerability: a city or region is vulnerable when it is at risk of undergoing any physical damages to its buildings, networks, infrastructures or population during and following an unforeseen or disastrous event. Physical vulnerability can also be defined in terms of degree of exposure, or the degree of susceptibility of its population, networks or infrastructure to damage due to exposure (Reghezza, 2006:36). The second dimension is social vulnerability, composed of two aspects: adaptability and resilience. A society that can't adapt in terms of anticipation, response speed and efficiency in responding to a damaging event is more vulnerable, comparatively, than a society that can easily adapt. Resilience is the capacity of communities to handle shocks or external damages that can affect their infrastructure, and the ability to recover afterwards (Adger, 2006). Therefore, a community that isn't resilient is even more vulnerable, since social and physical effects increase. Adaptability and resilience both are affected by social factors, such as the economy, poverty, and political will, and this explains the importance of the social dimension of vulnerability. In sum, the susceptibility of a society to be exposed to danger, the gravity of the damages, adaptability and resilience determine vulnerability.

Canada is becoming more and more vulnerable to different sorts of crises. The phenomenon that is probably the most discussed, but the most forgotten about in current public debates, is climate change. Because Canada occupies such a vast territory, there are many different types of climates. As such, the effects of climate change differ among regions. The coastal regions are affected by the higher sea levels, while the prairies are affected by drought. Regardless of the climate or the conditions, each of these climate changes affects local economies and increases risks and existing social vulnerabilities (Morin, 2010:1).

Rising sea levels are a consequence of climate change, and they are mostly caused by melting glaciers. Therefore, we can assume that the number of floods, which bring about great consequences, will only increase. Melting glaciers make Canada vulnerable to new threats. Leuprecht and Hataley, for instance, mention that global warming in the Canadian North opens new passages for arctic ice, which then puts into question Canadian sovereignty in the Arctic, as well as issues of security, defense, and emergency for such a vast region that has a very small population and is very inhospitable and far from security forces, such as military bases (2003:190). It's therefore very important for the Government of Canada to work together with the arctic regions in order to develop the tools to ensure their capacity to not only prevent crises, but also to properly react to them if need be. As well, the melting of glaciers also

causes frequent avalanches that can isolate entire communities from the rest of the country and destroy their infrastructure (like their railways, for instance).

Climate change can increase the frequency and intensity of weather conditions and extreme climates (Williamson, 2009:xii). This means, for instance, that periods of drought will become more intense and frequent, which can indirectly affect Canadian infrastructure. Among other consequences, forests will be increasingly at risk of forest fires (Williamson, 2009).

As well, because of climate change, storms that would otherwise only occur in tropical climates have begun to affect Canadian coastal cities and regions (Leuprecht and Hataley, 2013:190). Similarly to melting glaciers and droughts, these tropical storms greatly affect infrastructure. For instance, a hurricane or a tornado does not only affect localised regions. On the contrary, the strong winds and excessive rainfall extend to a larger territory, affecting multiple municipalities simultaneously, and creating a need for more complex and collaborative intervention.

Additionally, especially in a Northern country like Canada, it is important to ensure the robustness and resilience of energy infrastructure. It is especially important to learn from past events, in order to ensure that Canada is ready to tackle emergency situations. This does not only mean targeting electric communications, but also anything that is related to the transportation of oil and natural gases, especially oil pipelines and every other method of transportation of these products that can be potentially dangerous. It is especially important to address these questions as they concern security, the environment, the economy, and quality of life.

Besides the issues related to climate change, there is also the problem of aging infrastructure. In Canada, the state of infrastructure is so worrying that Saez Mirza, professor of civil engineering at McGill, believes that the country can lose its competitiveness in the near future if nothing is done, as the deterioration of our infrastructure affects the productivity of the country (Mirza, 2014). Aging infrastructure does not only create a danger for the safety of Canadians, but it also reduces mobility. This is evident in the potholes that appear during all of the mild spells in the winter months and the pieces of concrete that sometimes fall off of viaducts. There are more and more aqueducts that are breaking and that cause sinkholes, and this presents a danger to citizens using the roads.

In terms of public health, Canada is also increasingly vulnerable to pandemics. It would be difficult to escape the potential threats of pandemics, especially due to the amount of travel in and out of the country. The health sector is on the *National Strategy for Critical Infrastructure's* list of critical infrastructure sectors. If there were a major pandemic, many people would have to leave their

workplace, and many human, physical, and financial resources would be needed to fight against the pandemic. This might destabilise and exceed the capacity of the health sector and its infrastructure (Public Safety, 2014:4).

Terrorism is another factor of vulnerability that is often spoken about, especially after the attacks on September 11, 2001. According to Public Safety, there are three forms of terrorist threats: violent Islamic extremism, other international terrorist groups, or internal militant extremism for specific causes (Public Safety, 2013:8).

Specifically related to criminality, vulnerabilities are most often on a smaller scale: individuals, family units, communities, businesses (cybercriminality), or property can be the targets of criminality. Critical infrastructure can be threatened – often on a larger scale – by both manmade and natural disasters and catastrophes. However, individuals, groups, or organisations usually cause criminality. For that reason, it is often quite important to look at the vulnerabilities of the ‘perpetrators’ and the victims themselves.

Building resilience and reducing vulnerabilities in crime prevention is a two-fold task: on one hand, the damage and risk to individuals needs to be prevented and dealt with. On the other hand, in order to reduce criminality, it is important to address the social problems that create criminal tendencies or negative outcomes in the ‘criminals’ themselves in order to reduce and prevent crime.

Vulnerability factors that can lead to crime can involve lack of access to housing, treatment, education and social programs. In order to negotiate these social problems and risks, different community programs and projects (like Youth Inclusion Projects) can help to reduce the circumstances leading to criminality among different segments of the population (Institute for the Prevention of Crime, 2009:2). As well, the provinces can emphasize the priority of creating educational programs for at-risk youth or adult students to reintegrate them into society (Institute for the Prevention of Crime, 2009:2).

In terms of criminality, many of the risk factors and factors of vulnerability derive from overarching social problems that need to be addressed by the municipalities in collaboration with the other levels of government, and especially with community programs and organisations. Investing in collaboration and municipal-based strategies will ultimately protect certain people that are especially vulnerable to crime (for instance, women, youth, aboriginals) (Institute for the Prevention of Crime, 2009).

2. Resilience and Preparedness as Concepts

In this section, we will first define resilience and preparedness, then apply these concepts and demonstrate these challenges in critical infrastructure and in crime prevention, and finally develop the connections and the areas where critical infrastructure and crime prevention overlap. This presentation will concretely define the need for greater resilience and preparedness in the two areas of this workshop.

Resilience is a term that is increasingly becoming salient in academia and refers to a society or organization's ability to survive, respond to, and learn from external shocks (such as natural disasters or a terrorist attack) that will almost always come as a surprise (Randolph 2012:132). This includes both physical resilience, which refers to the strength of physical infrastructure (roads, bridges, etc.) in the face of a crisis, and social resilience, which refers to the strength of individuals, groups, or organizations in responding to said crisis (Zellner et al. 2012:45). Furthermore, as Flynn (2008) notes, it often results from the commitment to four factors: robustness, resourcefulness, rapid recovery, and learning. To be resilient, he states that a system must remain operational in the face of disaster, manage the disaster effectively once it strikes, recover quickly in the aftermath, and learn from the process after the crisis is resolved (Flynn, 2008:7). Having this type of system is vital because the critical infrastructure of a society will essentially collapse in the face of disaster without it.

Public Safety Canada uses the following definition of resilience: "the capacity of a system, community or society to adapt to disturbances resulting from hazards by persevering, recuperating or changing to reach and maintain an acceptable level of functioning" (Public Safety Canada, An Emergency Management Framework for Canada, 2014). This definition, however, does not consider the individual. Dr. Michael Ungar, co-director of the Resilience Research Centre, defines resilience in the following way: "In the context of exposure to significant adversity, resilience is both the capacity of individuals to navigate their way to the psychological, social, cultural, and physical resources that sustain their well-being, and their capacity individually and collectively to negotiate for these resources to be provided in culturally meaningful ways" (Resilience Research Centre, n.d.). Perhaps this definition more accurately defines the broad individual and collective levels of resilience.

Preparedness refers to a system or community's ability to quickly respond to any crisis. This can involve for instance setting priorities and selecting the best strategies to deal with an event before it occurs (Institute for the Prevention of Crime, 2009:3-4). Luc Juillet and Junichiro Koji describe the terrorist attacks on September 11, 2001 as an agenda-setting event that highlighted the need for

emergency preparedness policymaking to Canada. Other such emergencies included the major ice storm in central Canada in 1998, the SARS virus in 2003, and the electricity blackout in 2003 (Juillet and Koji, 2013:25). A state's preparedness is defined by its ability to learn from the past or threatening emergencies, and to develop mitigation plans to deal with similar occurrences efficiently and effectively in the future. Flynn also discusses that preparedness included good citizenship, and creates a peace of mind of security and safety for citizens. He outlines that preparedness should be tailored towards the specific context (the community, its access to resources, or its socioeconomic conditions) and towards expectations. This, of course, involves increasing infrastructural and individual resilience (adding a generator to a building or preparing a family for an emergency, for instance), and then creating a mitigation plan (Flynn, 2007:155-9). Preparedness can also be achieved on a much larger scale. The events outlined above, as well as more recent events in Canada – like the Lac Mégantic derailment, or the ice storms in Southern Ontario this year – show that the state of Canadian preparedness for large-scale emergencies suffers from insufficient multilevel coordination, which creates unnecessary delays or inadequate organisation. These issues are symptomatic of a state that is unprepared to work with shared responsibilities (between the different levels of government along with community programs and the private sector), which in turn hinders the effectiveness of government planning, coordination, and intervention in any large-scale and/or unforeseen emergencies (Juillet and Koji, 2013:26).

The idea of resilience and preparedness then begs the question: how can we develop a system that can respond to these unexpected external shocks? Quite simply, this is a matter of preparedness. We have quite clearly outlined the concept of resilience, but we have not yet adequately demonstrated how we can develop that type of resilient system. To be better prepared, we must seek to develop the infrastructure systems required for effective disaster management and be proactive rather than reactive. This means putting in place the proper infrastructure, plans, and projects so that governments and first responders can properly intervene (Hémond and Robert, 2012:405). In addition, it means developing and maintaining the right physical infrastructure so that it does not completely deteriorate when under stress (Rogers et al., 2012; Hill et al., 2012). A bridge for example, must be designed to bear significant stress, while something like a hospital must be designed in a way that allows for a rapid increase in the volume of patients if the need arises. If we do this, surely we can face disaster better amidst all of the vulnerability that we are facing. However, developing these types of mechanisms is not so simple. In the next few sections, we provide some analysis and options to begin addressing the implementation gap in resilience and preparedness in critical infrastructure and crime prevention.

2.1 Resilience and Preparedness in Critical Infrastructure

As we mentioned earlier, we are becoming increasingly vulnerable to disasters and catastrophes. As recent events in Lac Mégantic and the Boston Marathon have shown, disasters can strike at any time and can be nearly impossible to predict. Considering that, it is vital that we recognize the importance of being prepared. Indeed, disaster can strike randomly, but that only emphasizes the necessity of developing the infrastructure required to mitigate its effects. Only through developing resilient critical infrastructure systems can we truly be prepared in the unpredictable environment we are currently living in. However, developing this critical infrastructure is not so simple. The Canadian legislative framework is a complex multi-jurisdictional system where developing resilient systems often relies on input from multiple levels of government and numerous different actors and stakeholders. It is therefore important that when advocating for the development of critical infrastructure, we do so with an emphasis on collaboration and multilevel governance. If we are to be prepared in this increasingly uncertain atmosphere, we must not only develop the necessary critical infrastructure, but also find ways of doing so with the cooperation of all levels of government.

Grolinger et al. define critical infrastructure as “independent, man-made systems and processes that function collaboratively and synergistically to produce and distribute a continuous flow of essential goods and services” (2011:1). Or as Public Safety Canada defines it, critical infrastructure refers to “the processes, systems, facilities, technologies, networks, assets and services essential to the health, safety, security or economic well-being of [society] and the effective functioning of government (2009:4). This includes, but is not limited to, roads, bridges, hospitals, emergency services, maintenance crews, community centers, government buildings, and other essential structures (Rogers et al., 2012:75). In other words, critical infrastructure essentially represents the elements of society required for its regular functioning. For obvious reasons then, these elements are highly important in the context of a disaster. When disaster strikes, the first thing that citizens will often turn to is one of the many critical infrastructure systems at their disposal. Perhaps they will need the assistance of an ambulance or a police officer, or perhaps they will need an emergency response team that can guide them through their struggle. Or, even more concretely, perhaps they will require an effective system of roads so that someone can actually respond to their crisis. Either way, every citizen requires strong critical infrastructure in some form or another in the case of a disaster. Developing critical infrastructure that can at least survive crisis should therefore be the priority of any government.

2.2. Resilience and Preparedness in Crime Prevention

The concept of resilience and preparedness in crime prevention involves protecting against risk factors. Crime prevention focuses on the individuals that make up a community. In this case, resilience becomes a question of situational/environmental contexts, as well as of developmental pathways. The costs that come of criminality do not only affect individuals: they extend beyond the victims or perpetrators and they affect society as a whole (Junger et al., 2007:329). As communities are made up of individuals, businesses, and resources, it is important to build resilience on all of these fronts.

Public Safety Canada (2009) provides some illustrations of resilience in the area of crime prevention of by reinforcing the following activities:

- Providing assistance and support to vulnerable individuals and communities
- Helping communities recognize available resources, knowledge and networks and focus on strengths
- Promoting mutual trust and assisting communities to identify risks, gaps and priorities.
- Building and maintaining collaborative partnerships with community organizations, other levels of governments and non-governmental sectors; and
- Pulling together resources to enhance individuals/communities' capacity to navigate and negotiate resources and opportunities

Traditionally, research and practice in the area of crime prevention have focused on investigating criminogenic risk factors and the interventions that could counter, reduce, or eliminate them. The focus, from national, local, and international bodies, has been on improving community safety and understanding crime by investigating risk factors related to crime, fear, and insecurity (Léonard et al., 2005:233). However, these factors are not the sole predictors of crime: research has to be done on protective factors and resilience. Resilience grows and is strengthened when individuals and services within a community interact and collaborate towards community solidarity. In crime prevention, building resilience refers to preventing crime by enabling individuals, families or communities to better respond or react to negative influences that could lead to criminality, as well as dealing with the consequences subsequent to any natural or manmade disasters. For instance, experts in crime prevention research have emphasized the importance of creating a socially cohesive space, rather than simply a defensible space. This implies that creating a sense of community is important and useful in deterring negativity and criminality (specifically against properties) (Waller, 2014:216).

Crime prevention also needs to focus on enhancing protective factors – the positive influences that can improve the lives of individuals or the safety of a community – in order to develop preparedness and preventative measures. Protective factors, especially community ties and

interpersonal relationships, can make up for criminogenic risk factors and can positively affect outcomes (Waller, 2014:20). These may reduce the likelihood of criminality, or may make communities stronger when dealing with the aftereffects of a crisis affecting the functioning of society. Protective factors include attributes, characteristics, or elements that can decrease the likelihood of criminality and violence (Public Safety Canada, Risk and Protective Factors, 2014). In that regard, resilience in critical infrastructure and in crime prevention is intrinsically connected: in both cases, building resilience involves a negotiation and reduction of the vulnerability of the community. In both cases, building resilience involves increasing the robustness of a society when recovering from a crisis.

2.3. Links between Crime Prevention and Critical Infrastructure

Promoting strength-based approaches, preparedness and resilience is important in tackling the entire problem of community resilience in crime prevention and critical infrastructure, especially in the areas where these two domains coincide. In both crime prevention and critical infrastructure, it is important to increase preventative measures to increase preparedness (e.g. building resilience infrastructure, establishing multi-level collaboration and action plans for emergencies, and improving protective factors to prevent criminality and violence). When a crisis does occur, communities are impacted both on the collective and individual levels. Therefore, it is important to look at resilience from both the angles of critical infrastructure and crime prevention.

There are many social problems that require collaborative resilience in crime prevention and in critical infrastructure, with a key focus on a strategic partnership between the two. For instance, one subject that needs to be explored is the rise in criminality following a major crisis affecting critical infrastructure (for instance, the recent floods and ice storms, and the tragic train derailment in Lac Mégantic). As well, the rising phenomenon of copper thefts touches both the construction and maintenance of critical infrastructure, and involves knowledge and action in crime prevention. Other phenomena that require resilience in critical infrastructure and in crime prevention are copper thefts, civil unrest (the feeling of panic, or when protests occur and interfere with construction, for instance), and cybercriminality (a new domain of crime that has serious impacts on critical infrastructure).

3. Multilevel Governance and Collaboration

As mentioned earlier, collaboration between the various levels of the government along with private and non-profit community organisations is important in order to best promote preparedness and increase resilience. The concept of multi-level governance evokes the coordination and partnerships between the multiple levels of government (federal-provincial-municipal) along with other non-

governmental actors in policy-making (Champagne, 2012). Although at the time of Confederation, the main decision-making actors were the provincial and federal levels of government with the various areas of policy-making distributed neatly between them, the current Canadian context involves the necessary collaboration between the federal, provincial, and municipal levels of government. For this reason, there is currently increased attention to the involvement of municipal or local governments in the process and the question of this vertical coordination and participation is important for infrastructure development and crime prevention (Champagne, 2013). Specifically when addressing conflicts and crises that can affect individuals and societies, it is very important that the federal and provincial governments work alongside with municipalities and their organisations and tools, as communities are directly affected by unforeseen events and criminality. Therefore, it is important for municipalities to have the necessary political instruments and foundation to be able to work together with the private sector and community organisations, to create partnerships and foster awareness. Cooperation and governance are key elements of a resilient system. This section will first provide some examples of multilevel governance and collaboration, and then elaborate the need for increased attention to these concepts in crime prevention and critical infrastructure.

3.1. Examples of Multilevel Governance and Collaboration

In both crime prevention and critical infrastructure, it is clear that governance should involve collaboration between the various levels of government and the private/non-profit/community sectors. What could be better than some concrete examples, in Canada and abroad, in order to explain how collaborative governance is essential in order to ensure resilience in critical infrastructure and crime prevention? The following are some examples of approaches that have been taken or can be taken towards more collaborative and coherent policymaking models.

- In Australia, the National Strategy for Disaster Resilience analyzes and incorporates the strengths of each of its collaborators in the development of its strategies. These collaborators include the government, businesses, citizens, non-governmental organisations, and communities (Council of Australian Governments, 2011).
- In California, the Gateway Cities Partnerships targets collaboration between governmental, non-governmental, and private organisations in order to resolve local problems (The William and Flora Hewlett Foundation, 2013:16). Right now, these problems don't necessarily include infrastructure resilience, but it is quite possible that infrastructure might be part of their mandate in the future.
- In New Zealand, the Ministry of Environment works together with local governments, engineers, the agriculture sector, and insurance businesses to tackle any problems created by climate change (Corfee-Morlot et al., 2009:93).
- In Toronto, the Action Neighbourhood Change program coordinates the activities of local businesses, governments, volunteers, community programs and organizations, and citizens in

order to improve the services provides in all of the communities of Toronto (United Way Toronto, 2013).

- In Canada, the Canadian Heart Health Initiative is based on collaboration from the federal, provincial, and local levels of government, as well as with non-governmental organisations, in order to improve Canadian cardiovascular health (Rocan, 2009:2).
- The City of Boston was able to reduce homicides between young men by 50% in two years by creating a city wide strategy that relied on creative protective factors from a variety of angles: it involved strategic use of policy resources, investments in school programs and programs to help men find jobs, and mobilization of mothers and family members to pressure their youth to abandon violent associates (Institute for Prevention of Crime, 2009:2).

As well, in Canada, public policies that pertain to crime prevention range across the various stages of life (from prenatal to adulthood), across policy sectors, and across governmental levels and jurisdictions (Junger et al, 2007:333). For instance, the National Strategy on Community Safety and Crime Prevention, a national council established by the government of Canada in 1994, was founded on a broad vision that meant to encourage federal and provincial cooperation in collaboration with citizen and community efforts at the local level (Léonard, 2005:234).

3.2. Multilevel Governance and Collaboration in Critical Infrastructure

As it was previously mentioned, developing critical infrastructure cannot be done without emphasis on multilevel governance. Especially in a multi-jurisdictional system like Canada, understanding this is vital. We need collaboration, cooperation, and policy coherence. We require a strong focus on intergovernmental analysis and a more complete understanding that developing resilient systems is a complex process. The issue, however, is that the literature often undermines the vital need for policy coherence. Quite often, studies focus on preparedness, resilience, internal adaptation, recovery—all important things in critical infrastructure development—in the context of single organizations in times of crisis (Burnard and Bharna, 2011; Randolph, 2012; Rogers et al., 2012). Or alternatively, they put heavy emphasis on the role of the community, alone, in moving through crisis (Henstra, 2010, Zellner et al., 2012). Although this does add value to the study of critical infrastructure and resilience, it does little to explain how critical infrastructure development can be done across different jurisdictions. The fact is that multiple levels of government, stakeholders, private corporations, non-governmental organizations, and many others are involved when it comes to disaster management and preparation. Our approach, therefore, focuses on collaboration and preparation. We stress that we need to take an intergovernmental perspective to build policy coherence and recognize the complexity of critical infrastructure development. We can no longer escape the fact that a focus on multilevel governance and collaboration is essential in developing resilient critical infrastructure. As Kapucu and

Garayev state, one of the biggest reasons for failure in past disasters is because there has been insufficient collaboration and preparedness among organizations (2011:367). Furthermore, as Kapucu argues, collaboration between all sectors is vital if we are to maximize efficiency, combine resources, create policy coherence and prevent duplication (2008:257) We must therefore shift our focus and take these important concepts into consideration as we move forward. However, as the literature suggests, this may not be a small task.

Unfortunately, a number of factors present a significant challenge towards enhancing collaboration and multilevel governance. One of the most significant difficulties lies within our constitution. One of the basic tenets of the Constitution Act of 1867 is that power is divided clearly between the federal, provincial, and local governments. This, in essence, makes it more difficult for governments to collaborate because they all operate within their own spheres of influence (Bakvis and Brown, 2010:485). Within the constitution, municipalities were also placed under the jurisdiction of the provincial government. This creates added difficulty because it essentially disconnects municipalities from the federal government (Juillet and Koji, 2010:33). If we are to shift our focus to multilevel governance and collaboration, then we must find a way to close this gap. As Juillet and Koji (2013:45) note, municipal communities have been historically left out of discussions involving emergency preparedness. Considering the fact that municipal communities are generally viewed as the first line of defense against a disaster (Henstra, 2010:245), this seems particularly odd. If we are to be more resilient and better prepared, we need to focus on developing a strong partnership with all levels of government. Along with this, another key issue associated with resilience and multilevel governance is that there is often little political will to take action on this issue. Many municipalities are often weak and underfunded, and tend to focus their efforts in other areas (Henstra 2010:245). Despite increasing vulnerability, the chances of disasters occurring are still quite low, and the benefits of allocating resources may never be realized. (Henstra 2013:5) Most municipalities have little incentive and capacity and few resources to participate in these kinds of initiatives or even to join the discussion on the issue. Taken together, these issues present significant challenges for moving forward on the issue.

Nevertheless, difficulty is no excuse for avoiding action. The time has come for us Canadians to pay serious attention to multilevel governance in emergency preparedness and critical infrastructure in Canada. The Federal government has just started to recognize the importance of a collaborative resilience approach. Since 2009, Public Safety Canada has used multilevel governance and collaboration as central concepts in its *Action Plan for Critical Infrastructure*. It recognizes the complexity of the

Canadian framework and advocates for a collaborative national approach between federal, provincial, territorial, and critical infrastructure partners (Public Safety Canada, 2009). Furthermore, it also discusses the development of a national cross-sector forum to promote collaboration across sector networks and emphasize how important it is for future governments to work together on future projects (Public Safety Canada, 2009:4). This shows that the groundwork is at least there for all of the involved stakeholders to work together and to build on this initiative. Indeed, Public Safety has recognized that multilevel governance is important. But as the other literature suggests, there are a lot of complications surrounding the implementation of the concept. It is therefore imperative that we work on finding methods of reconciling these differences and actually finding ways to create tangible policy change.

3.3. Multilevel Governance and Collaboration in Crime Prevention

Currently, there are studies being done to evaluate the connections between individual or family conditions and their environments. The result of these studies is that policymakers are beginning to look at place-based and community-driven strategies (Bradford and Chouinard, 2010:54). The need for collaboration and partnerships is well acknowledged, and the structures for collaboration are growing and developing (Paquin, 2005:318). The need for collaboration and partnership is especially evident in the current public demand for more individualized public solutions, the public resistance to spending more money, and the growing number of problems resulting from climate change, poverty, public safety, and urban planning factors (Sorensen and Torfing, 2012:3). The issue, however, is that there's a conflict between the institutionalised top-down structure and the new community-driven models that require collaboration and negotiation (Bradford and Chouinard, 2010:54).

Community-driven initiatives are based on local knowledge and community participation, and they are meant to build community solidarity and work on individual, neighbourhood, and community resilience via local tools and capacity building. These require a change in the current top-down models of governance that emphasize government priorities that rely on performance measurement and accountability. A whole new model of collaborative resilience, with the participation of all of the levels of government and local stakeholders, is necessary to implement community-driven initiatives effectively and efficiently (Bradford and Chouinard, 2010:56-57). It is clear that there are no policy sectors that could effectively prevent crime. Cross-sectoral governmental structures and multi-level collaboration are important in order to 1) bridge the gaps in research that could affect policymaking and 2) combine the different elements from scientific, service, and community structures in order to efficiently act on criminogenic factors (Junger et al, 2007:335). Building crime prevention with the

support of various partners (within the government, as well as other stakeholders) is a key asset necessary to building sustainable resilience. And, when this collaboration is developed over a multitude of organisations and institutions, it is essential to build good models of governance, and effective strategies for communication and dissemination (Léonard et al, 2005:243).

Conclusion

Given all of the issues presented in this paper, it is clear that there are many areas in which Canadians and their communities are vulnerable. It is time to focus on resilience in crime prevention and critical infrastructure and on multilevel governance in order to better manage the crises that we face. It is important to work collaboratively in order to reduce the factors that lead to vulnerability. These factors include climate change, terrorist threats, pandemics and the risk factors that lead to street-level violence and criminality. As well, it is important to mention that in the cities and regions where these tragic events occur, the level of criminality can sometimes increase. For instance, in the case of Lac Mégantic, there was an increase in the number of thefts following the train derailment in 2013. For the communities that are already vulnerable, it is important to consider this tendency in the prevention plans, in order to make these communities more resilient to the events that might occur.

It would be advantageous for federal and provincial governments to work together with municipalities and their private and community organisations in order to combine their different resources and abilities in order to best overcome these emergencies. Overall, it is important for them to be capable and efficient, in order to best protect the resilience of their infrastructure, citizens, and communities (Quick and Feldman, 2014:6, 9). In other words, instead of seeing the differences between these entities as constraints to collaboration, they should see an opportunity in the various strengths and resources that each can bring to the discussions.

We know that it is essential for new infrastructures and new community programs, action, and support to be created with resilience in mind. But it's also important to know how to replace infrastructure and to reinforce community solidarity in order to become more resilient before a new crisis arises. At the individual level, it is important to understand the different risk factors that can promote violence and criminality, so that these can be preventatively resolved, and so that overarching social problems are diminished. Given the different examples of risk and crises that our communities are facing, it is clear that we need to establish permanent and strong connections between the various

levels of government, along with key actors in the private and non-profit/organization sector, in order to prevent and react to crises affecting organisations, institutions, infrastructure, and individuals in our Canadian communities.

This workshop is a key, strategic element of the partnership between the Centre on Governance at the University of Ottawa and Public Safety Canada, initiated through the recognition that we need to work together in order to improve the knowledge base and policymaking, with the objective of effectively and efficiently protecting and improving the safety of our communities.

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