

## **IN THIS ISSUE**

**Letter from The Editor**

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**The Making of a Resilient Coastal City**

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**In Memoriam – Ken Macdonald**

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**Toronto Embarks on Resilient City Status**

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**Montréal, Resilient City**

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**A Road Map for Achieving a Resilient Calgary**

---

**Real Events**

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LETTER FROM

## **THE EDITOR**



**100** Resilient Cities was created by the Rockefeller Foundation to help cities become more resilient to physical, social and economic challenges. Over 1000 cities from around the world submitted applications to become members of the 100 Resilient Cities. Montreal, Toronto, Calgary and Vancouver were all chosen.

Cities in the 100RC network are provided with the resources necessary to develop a roadmap to resilience. They all establish a Chief Resilience Officer to lead the city's resilience efforts, and develop a unique resilience strategy. The 100RC furnishes its members with resources that assist them to develop and implement their resilience strategies. Membership in this global network of member cities also provides the benefit of being able to draw on the knowledge and experience of Chief Resilience Offices throughout the world.

We've had the privilege of interviewing Project Leads, Chiefs and Deputy Chiefs of the Resilience Offices across the country. Their challenges to create resilient cities are as unique as the cities they represent. Their strategies are inspiring, as they all aim to create cities that will function well into the future regardless of what stresses or threats they face. This mini Digest is Part 1 of a 4 Part series that tells their stories.

As these stories look to the future, we also remember the past. We remember a key member of DRIE who was very much part of its foundation, Ken Macdonald. Each organization and city is a fabric of the people who came before us and everything they created. We truly stand on their shoulders. ■

# The Making of a Resilient Coastal City



Interview with  
Katie McPherson

Written by Vickie Gougoulis

Vancouver's beautiful location amid the ocean and mountains, along with the friendliness and balanced lifestyle of the West Coast has often ranked as one of the best cities to call home. However, the city's long term attractiveness could be undermined by climate change and the risk of earthquakes, flooding, water shortages, fires, an opioid crisis and housing affordability. The Insurance Bureau of Canada has estimated the cost of damage from a major earthquake could be as high as \$75 billion, impacting the city and the nation for years.

With the potential for all these future threats, the City of Vancouver applied and was granted membership in the 100 Resilient Cities network in 2016. I had the privilege of interviewing Vancouver's Chief Resilience Officer, Katie McPherson, who gave some wonderful insights into what is on the top of Vancouver's list of things to tackle. She is leading a team, partnering with academia and engaging with local, provincial and federal stakeholders and partners to ensure Vancouver is resilient now and in the future.

Her very engaging answers to my questions follow below.

## WHAT ARE VANCOUVER'S 3 SIGNIFICANT THREATS AND STRESSES?

It's always a challenge to name only three - you can start off with one and it blossoms into a hundred.

Earthquakes and the impact on buildings and infrastructure is the first. Experts tell us we have a 30% chance of experiencing a catastrophic earthquake within the next 50 years. That's compounded by the state of our infrastructure. In the past, we didn't have a lot of knowledge of our earthquake risk, up until the 70s we didn't even know earthquakes happened here. The building code has improved significantly over time, and while the City of Vancouver has a program in place to mitigate risk to civic facilities

and city-owned infrastructure, many privately owned buildings remain at risk. Further, the building code today addresses life-safety, so structures that meet it won't fall down, but that doesn't necessarily mean they will be inhabitable after an earthquake.

Climate change is next. I know that this can be all encompassing but as a coastal city it affects us directly in many different ways. Just last week we had flooding every day on most of our major streets because of heavier than normal rain. We expect this kind of extreme weather to continue in the future and to be more frequent. Additionally, other climate impacts include sea level rise which is significant for us. Climate change will impact precipitation and snow-pack which will have serious implications for our water supply that comes from the Northshore. In terms of stresses social inequity is the most prominent theme in our work so far. This is being driven by a lack of affordable housing and a growing income gap. While Vancouver has a strong and diverse economy, not everyone is able to engage in it and a number of people have expressed concern about the changing nature of work and how and if they will have opportunities here in the future.

Our shocks are and will be exacerbated by these stresses. Being able to recover from acute events like earthquakes and thrive through more frequent flooding, relies heavily on the day-to-day strength of our community and the level to which people are able to access support and resources to prepare, respond and recover.

## HAS THERE BEEN SIGNIFICANT RISE IN SEA LEVELS IN VANCOUVER?

As part of our Climate Change Adaptation Strategy, the City's Sustainability team recently released a Coastal Flood Risk Assessment that looks at the areas at risk and timing of potential impacts. A lot of this kicked off in 2012, when a storm surge combined with a king tide resulted in significant flooding in areas that had previously never been affected.

We saw damage to Kitsilano pool, many parks and beaches, and the sea wall. Most of what we have been seeing in terms of coastal impacts is associated with high tide events. The projections show the minimum we will be looking at is one meter of sea level rise over the next hundred years. This would impact about 13 km<sup>2</sup> of City property –almost three times the size of Stanley Park and includes high value recreational areas, coastal infrastructure, as well as putting



pressure on sensitive ecological systems in the inter-tidal zone. A metre is quite significant and we have changed building standards to accommodate this. The bad news is that the likelihood of it only being a metre is low. We know climate projections have exceeded the best case scenario in many places. We are planning for a metre but, we need to continue to do a lot to mitigate climate change.

### **WHAT ARE SOME OF THE STRATEGIES THAT FOCUS ON THESE KEY STRESSES AND THREATS? EARTHQUAKES ARE MORE OF A WEST COAST THREAT, WHILE LACK OF AFFORDABLE HOUSING SEEMS TO BE SOMETHING THAT VANCOUVER AND TORONTO SHARE.**

In 2013 the city developed an Earthquake Preparedness Strategy and that helped create a number of options. Over the last few years that work was led by the Office of Emergency Management and included internal and external stakeholders. We've advanced a lot over the last few years and made significant progress in hardening our city infrastructure (like sewers and bridges), and increasing our volunteer capacity which is critical in the event of an earthquake.

The next phase of this work will focus on privately owned buildings. We recently hired Micah Hilt, former Deputy Chief Resilience Officer for San Francisco who was instrumental in their earthquake mitigation efforts. He will be leading the seismic policy work for the City and will work closely with Natural Resources Canada, the Province of BC, and with the Structural Engineering Association in BC and academic partners. It's a big challenge in the context of housing affordability because while we know we absolutely need to make sure that our buildings can withstand an earthquake, it's costly and difficult. The challenge lies in finding affordable solutions and making sure they work for our most vulnerable population. That is a huge part of the work.

### **THAT SOUNDS COMPLEX - HOW DO YOU ACHIEVE BOTH OF THOSE OBJECTIVES?**

It is, and much of this work falls outside the jurisdiction and capacity of the City. We are relying heavily on partners to enhance our technical understanding of the risk – social, physical and economic. We continue to work with the Province and the Federal government on this, and we will be doing significant stakeholder consultation to explore a wide range of options to develop and implement a comprehensive program. We have some great examples to look to as well, like San Francisco, LA, and Seattle who

are also part of the 100 Resilient Cities network. Closer to home, Victoria is also doing some really great work. We are learning from local and international experts. We will be looking at all kinds of options and working to prioritize buildings based on risk to lives, the role of those facilities in the community, and creating a criteria for recoverability that will guide this work.

Our Resilient Neighbourhoods Program is also very important. On one hand, there is a lot of work that needs to be done in terms of strengthening our infrastructure and recognize that the capacity of our communities to withstand these events and recover is linked to how prepared individuals and families are.

We also recognize there is strength in our communities and lots of experience with resilience that we can draw on. The Resilient Neighbourhoods Program will be co-developed and piloted in 4 neighbourhoods starting this year. We will be supporting community based organizations that will lead their neighbourhoods in the development of Local Resilience Action Plans. This will start with mapping hazards, and social and physical assets within their community, hosting community dialogues around local strengths, vulnerabilities, and concerns in the event of a crisis, and empowering people to work together to find ways to build community capacity to become more resilient. We want to empower our neighbourhoods with the information and tools they need to be able to work together in the event of an earthquake or a snowstorm. To do this we need to learn from and respond to the unique needs of the people who live and work in these neighbourhoods every day.

Vancouver's downtown east side is at the forefront of the opioid crisis. The opportunity we have after a disaster or crisis, is to learn from those responses. Although we are in the throws of a horrendous crisis, we have seen incredible action from the community to take care of each other. Learning from our community and the way they come together and respond to crisis is important in forming our strategy moving forward so that we really leverage that capacity and knowledge.

The Resilient Neighbourhoods Program is intended to help us learn and build on that capacity and encourage people to understand their role in not only the outcome of a crisis but also in the solution for a crisis. We have already surpassed the number of overdose deaths that we had in 2016, at the same time we've seen the community step



up and take action on the street while our health authority and first responders are working very hard. We know right now we are doing good response work, but response is not prevention, it's expensive and it doesn't address the root causes - across Canada there is a critical need to move that up to the front end and work on prevention.

### **WHAT PARTNERS ARE YOU WORKING WITH AS PART OF THE 100RC?**

We are in the very early stages of our Resilience Strategy. We started working on this in May and we spent most of the summer engaging internally to assess and determine where we should be focusing our efforts. We have benefited greatly from our partnership with AECOM. They are a strategy partner that has helped us draft our engagement strategy, assisted with the development and execution of the Agenda Setting Workshop, and is working with us to analyze data from a wide range of sources.

In addition to AECOM, we've had some great input and support from our local universities. Our academic community is one of the greatest local capacities the City can draw on. We are working with a group called the Global Network for Advanced Management (GNAM) through the University of British Columbia. GNAM is a platform partner with 100 Resilient Cities. Right now there is a talented team of graduate students providing research support to the City's Green Infrastructure Team that will be directly incorporated into our evaluation and options for our Rainwater Management Strategy. They are also supporting us in establishing metrics to measure success in our Resilient Neighbourhoods Program. We are very lucky to have this group of international students working with us.

We've also established a great partnership with Simon Fraser University (SFU) and their Public Square Program. **SFU's vision** is to be Canada's leading community-engaged research university and we are thrilled to be able to partner with them to host community dialogue on a range of issues. We really value those partnerships both now and moving forward. We are very lucky.

### **VANCOUVER IS BUILDING ITS OWN RESILIENCE STRATEGY BUT HOW DOES THAT TRICKLE DOWN TO THE OTHER CITIES IN BC THAT ARE EXPERIENCING THEIR OWN STRESSES AND THREATS?**

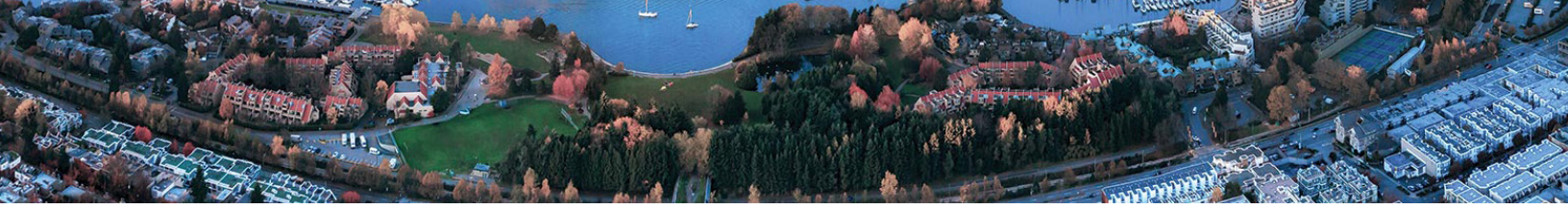
Vancouver is not an island. We are actually one of twenty-three municipalities in metro Vancouver and the City

is located on the traditional territory of the Musqueam, Squamish and Tsleil-Waututh Nations. Choices we make affect our neighbouring municipalities and local First Nations. Vancouver has been a regional leader, particularly in the work that has been done on climate adaptation, and we see this work being championed in neighbouring municipalities. One of the important things we need to remember as a city is that resilience cannot just be implemented within our borders. This year for example, there were wildfires all summer in the interior, while the fires themselves did not directly affect Vancouver, the smoke from the fires did. Our region, which is celebrated for our clean air and has set stringent targets towards this, had no control over the smoke. This is an important reminder of the need for ongoing climate and risk mitigation, and of the need to understand regional and global risks that will affect our city.

A second example occurred earlier this year when we had an unprecedented amount of snow. At one point all the major highways leading into the Lower Mainland were closed off. Increasingly as an urban area, we need to recognize our relationships particularly with the rural areas. While we are focusing on Vancouver, it's in our best interest to ensure that other communities surrounding the city are resilient. We have a mutually dependent relationship. Hundreds of thousands of people commute into Vancouver every day for work, in addition to visitors. Even if you are not a resident of Vancouver but work here, you are a key contributor to our economy. Whether you live in Richmond, Surrey or Burnaby we really need to make sure each city is resilient by sharing what we learn and working towards a resilient region.

### **WHAT IS THE PLAN FOR A RESILIENT VANCOUVER AFTER THIS TWO YEAR ROCKEFELLER INITIATIVE ENDS?**

Part of my job as we develop the strategy will be articulating that. Our Resilience Strategy isn't just a two year initiative. The 100 Resilient Cities grant will end, but in my opinion a successful strategy is one that is in itself resilient. Right now we are working with a wide range of partners and departments. We are working to infuse resilience from the ground up in our operations. In addition to having a resilience strategy, the extent to which we can influence others to integrate resilience thinking into their work, will be the legacy of this Program. An example would be our Planning and Sustainability Group that is launching a major initiative - CityCore 2050. They are incorporating the Resilience Framework to guide visioning for what



our city will look like in 2050. That is an example of the City's commitment to integrate resilience planning into all of our work.

**YOU'VE TOUCHED ON THE FACT THAT THE CITY'S SEISMIC POLICY LEAD IS COMING FROM SAN FRAN, AND THAT YOU HAVE LEARNED FROM OTHER COASTAL CITIES, SO THIS QUESTION WILL LEAD RIGHT INTO EXPANDING ON THAT. WHAT HAS BEEN THE GREATEST BENEFIT IN WORKING WITH OTHER GLOBAL CITIES THAT ARE PART OF THE 100 RC?**

I am going to divide my answer in two parts.

One of the greatest things so far has been the Team Canada relationship. Montreal, Toronto and Calgary are all part of the 100RC program and we make a point of having monthly check-ins. Montreal's Chief Resilience Officer, Louise has been phenomenal as she is a couple of years ahead of us. Everyone has been very supportive. It has been great to connect with other Canadian cities as we think about how we can collaborate on issues that are affecting us locally. An example we discussed is one of affordable housing, it's not just Vancouver facing this, but Toronto as well.

We have opportunities to talk about our shared challenges but also how we can leverage our work to be able to make an impact on a national scale. Our relationship is really strong and its growing, and I think that is one of the greatest benefits so far of the 100RC.

With respect to international cities, we have a lot in common with San Francisco and we work with them regularly on a number of fronts including emergency management and seismic resilience. LA is another city that we look to on that end. Our Mayor signed a Memorandum of Understanding with the Mayor of Seattle when we were first accepted into the 100RC program and we've been working with and learning from them, especially the work they're doing around equity. Our cities will face similar challenges in the future, so this will continue to be an important relationship.

We are seeing opportunities to work with cities with similar issues and cities we may not have otherwise reached out too. A great example is Athens. Athens is a city we haven't connected with in the past, but through this program we learned about the work they're doing around immigration, and particularly support for refugees.

In Vancouver we have an initiative called the Vancouver –Immigration Partnership, and although our experience is certainly not the same, we have the opportunity to learn a lot from their experiences. We've begun the conversation and are looking forward to continuing it. Immigrants make up a significant percentage of our population and there is certainly potential for an increase in the future with climate refugees. Learning now from the work that Athens is doing is going to be really important for us.

Through the support of 100RC, Katie McPherson's Resilience team is developing a Resilience Strategy that is not only city wide but is looking to ensure lessons learned may be shared with its neighbouring cities in British Columbia. Importing ideas that have served other coastal cities like San Francisco, LA and Seattle is giving Vancouver the leverage it needs to learn from cities that share similar seismic and climate challenges. Working with global cities, partners, academia, Vancouver is leveraging information that will ensure the infrastructure and systems they establish can persist, adapt, and grow no matter what kinds of chronic stresses and acute shocks Vancouver may experience.

*A warm thank you to Katie McPherson for this interview.*

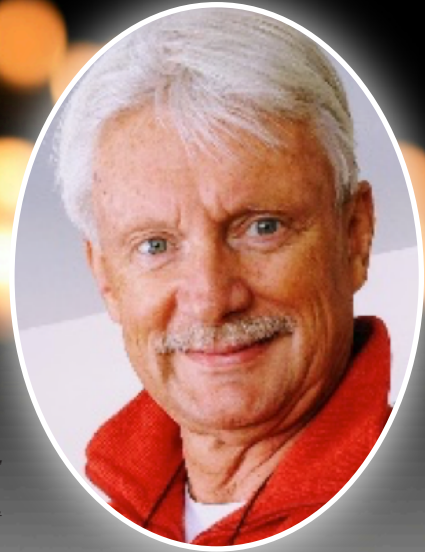
Katie McPherson has recently been appointed to the role of Chief Resilience Officer for the City of Vancouver. In this new capacity, she is responsible for facilitating the development of a Resilience Strategy in collaboration with local and regional stakeholders, and through a partnership with 100 Resilient Cities – Pioneered by the Rockefeller Foundation. Previous to this, Katie served as Manager of Community Resilience with Vancouver's Office of Emergency Management, leading complex risk assessment, planning, response and recovery initiatives for hazards ranging from earthquakes to oil spills.

Her interest in resilience is rooted in her experience as a volunteer responding to the 2004 Indian Ocean Tsunami in Thailand and has grown through leadership positions in the public, private and non-profit sectors spanning the fields of Emergency Management, Community Development, Climate Adaptation, and Disaster Recovery. She is passionate about connecting citizens to big ideas, and empowering communities to take action on global issues. She holds a Master's Degree in Disaster and Emergency Management from York University, and a BA in International Development and History from Dalhousie University. ■

In Memoriam

KEN

*Macdonald*  
FBCI



*With great sadness we note the passing of a long-time friend, DRIE member and board executive, Ken Macdonald. Ken died peacefully at home on October 13th after a battle with cancer. Those who attended DRIE Toronto meetings any time between 1990 and 2007 will remember Ken as a gentle giant, in more ways than one. Apart from his prodigious height, he stood out among us as one of the finest business continuity practitioners in Canada. He was a true gentleman in every respect and was a valued mentor for many in our field.*

*His distinguished career at CIBC was marked by many accomplishments. Not least among these were development of leading edge BC methodology, before Good Practice Guidelines even existed. CIBC was one of the first, if not the very first, organization to create the alignment with Risk Management as that discipline was emerging in the mid-90's. Ken was instrumental in developing and executing several spectacular crisis management simulation exercises, involving literally hundreds of people, from top executives down to clerical staff. He helped design and implement a state-of-the-art in-house business recovery hot site, with hundreds of seats ready for use 24/7.*

*Ken served as Treasurer on the DRIE Executive for a number of years, proving prudent and steady guidance for the organization. Within his tenure, the organization's finances were very stable and well managed. In 1995 Ken, along with Graeme Jannaway, Joan Egan (RBC), Rex Pattison (Scotia), Tom Mai (BMO) and Des O'Callaghan (TD), created a 'BCP 101' full-day seminar as a DRIE special event. It was hugely successful, for attendance as well as financially. It was then taken on the road and delivered at the Pan Pacific conference in Vancouver in July, 1996 as well as at DRIE gatherings in Calgary, Winnipeg and Montreal.*

*In June, 1996 Ken became one of the first Canadian Fellows of the Business Continuity Institute in recognition of his leadership stature in the field. It was his nature to be a mentor and share his considerable wisdom and twinkle-eyed humour with anyone willing to have a conversation. Ken was a giver, both professionally and personally. Everyone looked up to Ken, figuratively and literally. All who had the privilege to know him recognized him as one of the finest people they ever knew.*

*Rest in peace, dear friend. ■*

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# Toronto Embarks on Resilient City Status



Interview with  
Stewart Dutfield

Written by Vito Mangialardi AFBCI, CBCP, PMP

**J**ane Jacobs was an American-born Canadian writer and activist with a primary interest in communities and urban planning. She once said *“Cities have the capability of providing something for everybody, only because and only when they are created by everybody.”* You might say this is the planning approach Elliott Cappell has in mind as Toronto’s first Chief Resilience Officer (CRO).

On June 15 2017, the City of Toronto announced a new partnership with 100 Resilient Cities (**100RC**) and appointed **Elliott Cappell** as Toronto’s first Chief Resilience Officer (CRO). This new position was created to lead city-wide resilience-building efforts to help Toronto prepare for catastrophic events and urban stresses, which are increasingly prevalent in the 21st century, through development and implementation of a comprehensive Resilience Strategy for the city. Mayor John Tory said that *“With his (Elliott Cappell’s) international work experience in climate change strategy and resilience principles, Elliott is the perfect person to guide the City’s participation in 100 Resilient Cities.”*



In exploring this topic from the program management perspective, I had the opportunity to chat with **Stewart Dutfield**, (who I happen to know) who is working with CRO Elliott Cappell on Toronto’s vision to becoming a resilient City. Stewart’s background was in the City’s Environment and Energy Division, with direct involvement in contributing to the 100RC application to the Rockefeller Foundation. This landed him a key role alongside the new CRO in program management. Our paths have crossed many times when addressing the resilience (integrity) and performance of telecommunications infrastructure to meet the challenges of climate change and severe weather.

The severe weather events of 2013 have informed Toronto’s most recent approach to resilience building . With the climate constantly changing, I asked Dutfield about the relationship between community pressure, the 100-RC initiative and the appointment of the CRO’s office, given the potential for continued major weather events; Dutfield said *“The flooding and ice-storm of 2013 are examples of shocks the City of Toronto has had to deal with and will probably have to again in the future. The previous work in response to climate adaptation was a trigger for the City of Toronto to continue this journey and apply to the Rockefeller Foundation to formally declare their vision, participation and contribution to be part of the 100-RC.”*

Any successful program requires a road map to get from where you are to where you want to be. This thinking led me to ask Dutfield about strategy and the overall planning methodology for the City of Toronto to develop its resilience strategy within the 100RC framework. This is a *“learning journey process”* as Dutfield calls it. The plan includes ‘knowledge transfer’ to and from other Canadian and global cities in the 100RC network, a collaborative and inclusive approach to engaging key and diverse stakeholders and building upon the existing work that has been happening at the City and that has been led by those key stakeholders.

Wikipedia defines a **city** as a large human settlement. Cities generally have extensive systems for housing, transportation, sanitation, utilities, land use and communication. Their density facilitates interaction between people, government, organizations and businesses, sometimes benefiting different parties in the process. I would say without doubt that the city of Toronto is a very large settlement with lots of diversity, which makes it one of Canada’s greatest cities.





To set the stage, 100RC defines “resilience” as the capacity of individuals, communities, institutions, businesses and systems within a city to survive, adapt, and grow, no matter what kinds of acute shocks and chronic stresses they experience. Shocks are typically single event disasters, such as fires, earthquakes, floods, disease outbreaks and terrorist attacks. Stresses are factors that pressure a city on a daily or recurring basis, such as chronic food and water shortages, an overtaxed transportation system, endemic violence, or high unemployment. City resilience is about making a city better, in both good times and bad, for the benefit of all its citizens, particularly the poor and vulnerable.

According to the Rockefeller Foundation, in profiling a resilient city (URBAN RESILIENCE), they seek seven qualities that allow them to withstand, respond to and adapt more readily to SHOCKS and STRESSES. The seven qualities are: Reflective, Resourceful, Robust, Redundant, Flexible, Inclusive and Integrated.

In June, the City of Toronto began work on its Preliminary Resilience Assessment, which is intended to provide some insight into Toronto’s past shocks and stresses, stakeholders’ perception of the city’s level of resilience and an inventory of existing programs, policies and plans that contribute towards making Toronto a stronger place. Dutfield went on to explain that *“the gap analysis from this assessment will be instrumental for the development of the strategy, which we hope to have signed off and adopted in 2018. The strategy will also explore the required public and private sector partnerships and funding to support its implementation”*

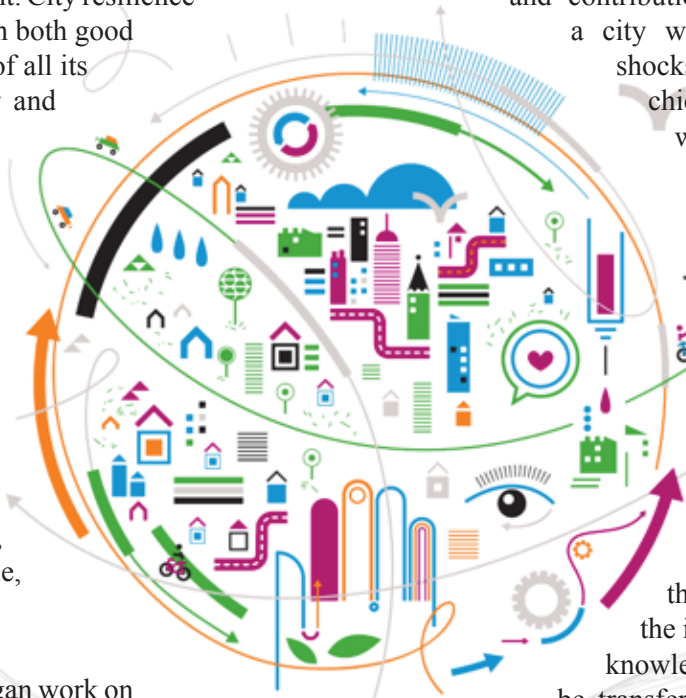
It was clear from the discussion with Dutfield that he sees that a key enabler and success factor for planning for a 100RC must be *“opportunities learned need to focus on neighborhood resilience, which integrates physical and environmental, climate change adaptation and social considerations”*. Dutfield then added *“learning from doing*

*will create the information needed and define actions that will have multiple stakeholder benefits.”* As I considered Dutfield’s position from my own operational resiliency planning experience and living through past local past shocks and stresses (2013 ice storm and 2017 flooding), it is no surprise that the City of Toronto with Elliott Cappell as the CRO are on the right transformational path.

Corporate partners add the needed value of participation and contribution in ensuring the outcome of a city wishing to be more resilient to shocks and stresses. It is a classic chicken and egg planning scenario which Dutfield plans to address by involving a *“diverse group of stakeholders, which then creates both the opportunity and the challenge. Meetings and mini-consultations will be held to help engage corporate sectors (both for profit and nonprofit) and the philanthropic sector (business endeavours for community good)”*. The plan suggests a targeted approach to the engagement of partnerships for the implementation phase. Again, the knowledge learned from this work will be transferrable to other cities to leverage when strategizing for a 100RC position.

The plan for a resilient Toronto beyond the 2-year Rockefeller initiation period includes seeking more funding to continue the work. Hopefully the City of Toronto can institutionalize the thinking and practice of becoming a resilient city. Such work is not a project with an ending and must continue indefinitely as change will be a constant. Dutfield describes it as *“Toronto being a resilient city is an ongoing journey as we learn more, because the city is a ‘sophisticated environment’.”*

As an operational resiliency practitioner, I can only imagine that the benefits of being part of the Canadian cohort of 100-Resilient Cities working together (Toronto, Montreal, Calgary and Vancouver) and interacting with neighbouring US cities such as New York, Chicago and Boston are invaluable. Dutfield is in a position to meet with his Canadian





100RC counterparts to “standardize the needed consistency to the planning approach including what resilience means to a city.” Personally, Dutfield concluded that “it is great to work with different professionals addressing soft emerging social equality issues, the environment and infrastructure resilience questions. As I see it, the cities are for people and people are central to how we build resilient cities. This work for me alongside both Elliott Cappell and the 100RC team is both challenging and exciting at the same time.”



To follow the vision for a more resilient community for our cities, I suggest you explore an association called ‘Rebuild by Design’ (<http://rebuildbydesign.org/>). The concept is about lessons learned and, in this case, is founded on the response to Hurricane Sandy’s (2012) devastating impact on the cities and regions of the eastern United States. Regrettably, in my experience, we need to use an unfavorable event to secure the required results. Wearing my risk hat, I see this too often in all types of sectors. An unfavorable event occurs, regardless of scale. An after-action report (post mortem) is undertaken with key stakeholders. A work plan to address the concerns falls on deaf ears, due to shortage of funding and resources, eventually, it becomes abandoned altogether. The vision ‘Rebuild by Design’ is promoting a ‘build it right culture’ where we need to reconstruct, even considering next generation solutions to make the communities we live in more resilient. Count me in if we can learn the lessons learned and enforce both physical and social considerations to avoid the same outcomes from similar events in the future.

You can’t predict a disaster, but you can plan for one.

*A warm thank you to Stewart Dutfield for this interview.* Stewart Dutfield is the Project Lead for Resilience at the City of Toronto. Stewart led Toronto’s application to join the 100 Resilient Cities network and continues to support implementation moving forward. Stewart’s interests lie in better understanding the interdependencies between physical and social infrastructure, working with internal Divisions and external partners. Stewart is interested in the critical role social equity plays in making cities more resilient.

Prior to taking on his current role, Stewart served as a Health Policy Specialist at Toronto Public Health (TPH) where he worked on the development of TPH’s cross-cutting climate change and health strategy. Before joining the City, Stewart was a Program and Communications Manager with Toronto Region Conservation Authority (TRCA). In that capacity he played a key role in the development of the Ontario Climate Consortium (OCC), a partnership of universities, the public, private and NGO sectors whose projects and programs are focused on addressing climate resilience. Stewart has been working on multi-sectoral resilience building projects with various partners since 2009. Stewart holds a Masters in Environmental Studies from York University, and a Bachelors in Environment Design, with a focus on architecture from the University of Manitoba. ■

# Montréal, Resilient City



Interview with  
Louise Bradette,  
CRO Montreal

Written by Vickie Gougoulas

**M**ontréal, Canada's second largest city is an important center of commerce, industry, tourism and culture. Montréal is home to over 1.7 million people from 120 countries speaking close to 200 languages, and 1 in 3 Montréalers was born outside Canada.

Prior to joining the remarkable 100RC, Montréal had in place a few initiatives that while not explicitly cited as resilience initiatives, formed a part of the city's capacity to deal with the shocks and stresses to which it is exposed. These programs are intended to improve citizens' quality of life and mitigate the harmful impacts of shocks and stresses on the lives of citizens. They include:

- the Schéma d'aménagement du territoire,
- the thinking on business continuity,
- the looping of the drinking water network,
- and the Plan d'adaptation aux changements climatiques (climate change adaptation plan)

These already well-established initiatives served as the basis for the development of the resilience strategy.

Montreal was chosen in the second round of cities by the Rockefeller Foundation to be part of the 100RC. As such, Montréal is leading the pack of Canadian cities involved in this initiative.

Louise Bradette is at the helm of embedding resilience into the DNA of the city. She holds three key positions simultaneously: Chief Resilience Officer (CRO) for the City of Montréal, Head of the Civil Security Center and Deputy Coordinator of Emergency Management.

It was wonderful to have the opportunity to speak with Montréal's very dynamic Chief Resilience Officer and ask her how she sees resilience unfolding in the very diverse city, she calls home.

## WHAT ARE THE THREE BIGGEST THREATS TO MONTRÉAL'S RESILIENCE?

Fortunately, Montréal has largely been spared any major disasters, especially when compared to other major cities in the world. As Montréal doesn't face stress often, its citizens aren't as prepared as they could be. The top three threats are evolving climate challenges, an aging population, and aging infrastructure.

This May's excessive rainfall affected 146 municipalities. Montréal and Laval then declared a state of emergency over the flooding.

The aging infrastructure has been inadequately maintained especially in the face of climate changes. Montréal is focusing its attention on waste management and local water and power needs, services that are essential to protect residents from significant cold weather events and heat waves. Both of these types of events have intensified with climate change and urban densification.

## HOW WILL THE RESILIENCE TEAM HAVE THE GREATEST IMPACT?

Firstly our team is creating internal and external networks. We are connecting with a lot of people, influencing and demonstrating how we can do things better. Our aim is to establish partnerships.

Montréal's Mayor and the CRO Office are looking to the future and know resilience will be a part of it. To achieve this we have put an Office for Resilience in place that will continue the great work that has been launched through the two years of the Rockefeller initiative. It is Montréal's objective to install resilience in the DNA of the city.

## IN THE EVENT OF MAJOR DISASTERS, HOW DO YOU COMMUNICATE WITH SUCH A DIVERSE POPULATION?

There are 34 boroughs and the City of Montréal proper. Each borough has an average of 60,000 citizens. We are working with local champions to identify what works well and then repeat it. We are not reinventing. Our aim is to use the network that is already in place, understand it better and create better links with it and within it.

## CANADA'S SUPPLY CHAIN, THE PORT IN MONTRÉAL AND CLIMATE CHANGE ARE INTERCONNECTED. HOW IS MONTRÉAL BUILDING RESILIENCE?

The city was built around its port and the railways that connect it to the rest of Canada. Today, the Port de Montréal generates annual economic benefit of \$1.5 billion for the



Greater Montréal region, and it has initiated an innovation shift intended to better adapt to a rapidly changing environment

The first step is to understand this multi-faceted challenge better. Collaboration between all the players: Port of Montréal, Environmental, Urban Planning, and Logistics is the next step. The Port is the door to Canada but the bridges are just as important. If the bridges are under construction or impacted by threats the supply chain is equally affected. With the recent huge flood, Montréal’s environmental department put together a plan and implemented it. There was emergency response and financial assistance in place. Thirdly, with lessons learned we are rethinking how we do things.



**AN ECONOMY THAT IS A DIVERSE ENOUGH TO HOUSE VIDEO GAME DEVELOPMENT AND MANUFACTURING AIRPLANES – IS IT RESILIENT ENOUGH?**

Montréal’s economy is as textured as its population is diverse. A survey of research centres and amounts invested in research and development shows that Montréal is first among Canadian cities. It is also one of just a handful of cities in the world where all the components required to manufacture an airplane are available. It is also an important hub for the video game industry. This industry alone generates an impressive \$1 billion in revenue and employs thousands. The fact that Montreal is so diverse makes it resilient. The Resilience Office is keeping in mind

that we have to attract talent to make these diverse industries operate seamlessly. The city is being reinvigorated to attract these talented minds and have areas that create a real draw for them.

**HOW DO YOU THINK BEING ONE OF THE 100RC WILL IMPACT MONTRÉAL’S ATTRACTIVENESS FOR IMMIGRATION, FOR CORPORATIONS THAT WISH TO SET UP SHOP AND FOR INVESTORS?**

Being part of the 100 RC has given Montréal a wonderful opportunity. We are collaborating with partners within the city and reaching out to partners outside the city. Not just to react but to mitigate. Montréal is becoming more attractive because we are evolving to try to detect what potentially may impact our city and trying to anticipate and mitigate our risks. Cities in North America haven’t been traditionally set up to do this. Montréal being part of the 100RC is giving us this opportunity. This makes us more attractive to anyone who wants to live and create a business here.

Montréal’s Mayor, the Resilience Office and the many partners in the public and private sector are extremely committed to resilience. This multicultural city is pushing hard to make the most of its tremendous resources. It is also capitalizing on the wealth of knowledge that the 100RC offers its members to create a truly evolving and resilient city.

*A very warm thank you to Louise Bradette for this interview.*

Louise Bradette is the Chief Resilience Officer (CRO) for the City of Montréal. She is also Head of the Civil Security Center and Deputy Coordinator of Emergency Management. With more than 20 years work experience at the City of Montréal, she understands the organizational culture inside out. Her accomplishments and main challenges include developing and maintaining a state of preparedness for Montréal, risk communication, land-use planning and business continuity.

Louise was educated at Université du Québec à Montréal (UQAM) in Administration and completed a Master in Public administration at École nationale d’administration publique (ENAP). ■

# A Road Map for Achieving a Resilient Calgary



Interview with  
Christine Arthurs

Written by Vickie Gougoulas

Home to the most head offices per capita in Canada, Calgary leads the country in many infrastructure and service areas. Its economy is historically tied to the oil and gas industry that experiences impressive cyclical economic swings.

In addition to Calgary's economic landscape challenges, Calgary's resilience has also been tested in recent years by natural disasters made for the history books. In 2013 flooding inundated the downtown core and residential neighborhoods along two rivers running through the city. The result: the most expensive natural disaster at that time in Canadian history! In September 2014 unprecedented snow resulted in damage to 50% of the urban tree canopy. Through these stresses and shocks, Calgary is gaining valuable insight to the value of resilience thinking. The City has undertaken a number of actions to address resilience. The City of Calgary was also named part of the 100 Resilient Cities (100RC) – pioneered by the Rockefeller Centre in May 2016.

Christine Arthurs, Deputy Chief Resiliency Officer for Calgary is in the hub of efforts to maximize the resources gained by becoming part of 100RC. She generously agreed to give us an insider's view to how membership in the 100RC will significantly strengthen the current work being done by the City of Calgary to prepare and recover from both stresses and shocks Calgary is likely to face.

## **CALGARY IS IDENTIFYING SIGNIFICANT OPPORTUNITIES FOR RESILIENCE BUILDING. PLEASE SHARE SOME OF THESE OPPORTUNITIES.**

Led by our Chief Resilience Officer, Brad Stevens, the Resilience team is capitalizing on the next four year cycle of The City's budgets and plans that will be in approved by Council in 2018. There is a unique opportunity to bake resilience into the current business plans and budget and ensure the needs of citizens are met.

The 100RC processes support our Resilience Office to take stock of resilience perceptions and actions underway. One of the first steps in the program set out by 100RC is an Agenda Setting Workshop, which we held in March of this year. The workshop brought together different stakeholders from across the city and region and helped us learn the top stresses and shocks the participants thought Calgary will face. We also spent some time learning about opportunities for additional resilience efforts. Participants also shared that they felt there were a few groups missing from the conversation. Including youth, seniors and business community representatives. In order to touch base with those groups we held focus groups to help us understand their perspectives.

We are taking all the information that results from the process and rolling it into the formulation of what our resilience strategy will include.

## **WHAT ACTION DO YOU BELIEVE WILL HAVE THE BIGGEST IMPACT IN ENSURING A RESILIENT CALGARY?**

First, is the opportunity we have been given by being part of the 100RC network. The network includes a generous platform that we can leverage to have dialogue with our peers and our community. In this way, we collectively define our resilience strategy. The platform also allows us to have conversations with our peers from around the world who are working through similar processes, issues and topics as we are.

Second, we are intentionally building from the lessons our recent stresses and shocks have offered us over the last few years.

## **HOW ARE CORPORATE PARTNERS INVOLVED IN ENSURING THE OUTCOME OF A MORE RESILIENT CALGARY**

We learned during the flood it is important to have relationships in place, before a significant stress builds or a shock occurs. We have these relationships with Corporate Calgary and are using them to discuss resilience and what we can address together. As it is still early days, we continue to nurture these relationships with the many sectors of the education, business, and not for profit communities.

During our Agenda Setting Workshop in March, we were fortunate to have more than 200 participants join us for the resilience kick off. The workshop included participants



from civic and community organizations, business and foundations, academic institutions, and government agencies, in a unique opportunity to identify, prioritize and plan to address the critical social, environmental and economic stresses and potential shocks facing Calgary. This was a way to bring together a group of people from all areas to talk about resilience and how it will affect them, the community, and Calgary as a whole. These conversations are evolving and maturing as we build and implement our resilience strategy.

The feedback from the Agenda Setting Workshop was collated and [this report](#) was created.

### **THE CALGARY FLOOD WAS A SIGNIFICANT CRISIS IN THE LAST COUPLE OF YEARS. WITH THE CLIMATE CONSTANTLY CHANGING, HOW WILL YOU TACKLE RESILIENCE IN ALL AREAS, GIVEN THAT THERE IS THE POTENTIAL FOR CONTINUED WEATHER EVENTS?**

Calgarians have a saying: “If you don’t like the weather in Calgary, wait five minutes.” Calgarians are resilient, through all the different stresses and shocks we have experienced we have always banded together as a community and worked towards finding solutions that will help us move forward.

We are very blessed that we have several initiatives underway:

- 1) We have a multi disciplinary team working on understanding how to adapt to and mitigate for future weather events.
- 2) Our City is considering the whole water cycle, including supply and demand. The importance of water and managing this precious resource remains a key resilience focus.
- 3) Our Calgary Emergency Management Agency is a mature team whose focus includes preparing for and responding to severe weather events.

Our partnership with 100RC seeks to focus and elevate these bodies of work, strengthening and streamlining approaches to address the various stresses and shocks facing Calgary. A lesson learned from the flood recovery has always been: “How can we provide the best municipal service to our citizens?”. Our citizens are at the core of our resilience

work, so that we as a municipality can continue to provide the services to our citizens.

### **WHAT IS THE PLAN FOR A RESILIENT CALGARY AFTER THE 2 YEAR ROCKEFELLER INITIATIVE?**

Resilience is not a new idea to Calgary. We continue to encourage resilience thinking and actions to be integrated into our culture at The City. We are keen to qualify the value of the resilience dividend for Calgary. We are very grateful for the opportunity to work with the 100RC network, where we can learn from them and where we can share our expertise too.

### **WHAT HAS BEEN THE GREATEST BENEFIT OF WORKING WITH THE OTHER CITIES THAT ARE PART OF THE 100RC?**

Municipalities currently hold many responsibilities and as urban populations grow, we share many similar challenges and opportunities. The 100RC network permits rapid, expedient and encouraging support among cities as we address these challenges.

We have instant access to Chief Resilience Officers, and can learn the tactics that they have already tried. Early in our membership, we were introduced to Grant Ervin, the CRO for Pittsburgh, Pennsylvania. Pittsburgh has gone through a similar economic challenge to Calgary. The 100RC supported Grant joining us in Calgary for an Economic Summit that we held here in March. He was able to share Pittsburgh’s experience and their challenges, and the processes and strategies that they used. We have been able to access these learnings and try to adapt them in the Calgary context.

We are also connected to other Canadian cities participating in the 100RC network – Vancouver, Toronto and Montreal. This membership recognises and supports our outstanding efforts to ensure greater resiliency to future social, economic and physical challenges. It also gives us the opportunity to become a Canadian leader in resilience planning and to share our practices and knowledge across the country.

### **WHAT DOES RESILIENCE MEAN TO CALGARY?**

Our greatest strength in Calgary is our community spirit. Calgarians have banded together over generations and we will continue to do so. Our resilience work is about the people of our community. It is about the people who have come before us and shown us the way; its about the people



who we work with and for everyday, and it is about ensuring that there will still be a resilient place called Calgary in the future

**Imagine Calgary** is our 100 year vision for the City: “A great city to make a living, a great place to make a life”. This is the vision we aim to achieve in establishing a resilient Calgary.

Calgary is capitalizing on its membership with 100RC to develop a resilience strategy fuelled by lessons learned from their own experiences and from the greatest cities the world over. Calgary’s strategy will translate into resilience on many levels. Among the objectives it hopes to achieve: insulating its economy from shocks caused by fluctuating oil prices and more robust responses to natural disasters, like the flooding of recent years. Through the 100RC Network, Calgary is learning from other cities and employing this opportunity to elevate their great city on the world stage.

*A warm thank you to Christine Arthurs for this interview. Christine (Chris) brings 21 years of experience across many business units and departments at The City of Calgary. As the Director of Resilience & Infrastructure Calgary, and Deputy Chief Resilience Officer Chris envisions the delivery of a long-term investment and value strategy for a resilient Calgary. Previous to her current role, Chris was the Chief of Staff in the City Manager’s Office and contributed solution based approaches to very dynamic and complex issues. After the 2013 Flood, Chris was the Director of Recovery Operations and she continues to oversee ongoing flood recovery activities four years later. Her career experiences also include leadership and collaboration in land use planning, departmental business plans and budgets, development and delivery of emergency management systems and community recovery from disaster events. Resilience is a value system for Chris that guides her personal and professional paths. ■*

# Real Event Log

## September and October, 2017

Sep 3	N. Korea	Magnitude of a nuclear test detonation suggests it may have been a hydrogen bomb
Sep 6	Caribbean	Hurricane Irma destroys most buildings on Barbuda; knocks out power in Puerto Rico
Sep 7	Florida	Over 500,000 ordered to evacuate the Miami area in the path of Hurricane Irma
Sep 7	US	Credit reporting giant Equifax admits massive security breach affecting 143 million
Sep 8	Mexico	Major earthquake M8.1 off the south coast destroys hundreds of building, kills 61
Sep 10	Florida	Irma weakens as she hits Florida, but still destroys 25 per cent of homes in the Keys
Sep 15	England	Homemade bomb explosion in London Underground train injures 29, sparks manhunt
Sep 19	Caribbean	Hurricane Maria causes devastation across Dominica, then heads towards Puerto Rico
Sep 19	Mexico	Earthquake M7.1 damages schools, homes, businesses in Puebla; kills at least 273
Sep 20	Puerto Rico	Maria hits with force; worst hurricane in PR in 80 years; power out over entire island
Sep 21	Toronto	Glass falls from a high floor of 4 Seasons hotel in Yorkville; the third such incident
Sep 22	Caribbean	Hurricane Maria damage escalates in Puerto Rico; regional death toll now at least 28
Sep 27	Puerto Rico	Most the island without power; Maria damage clean up and restoration may take years
Sep 29	India	Human stampede on a bridge connecting two stations in Mumbai kills at least 22
Sep 30	Alberta	Rental truck mows down pedestrians in downtown Edmonton; possible ISIS connection
Oct 1	Nevada	Sniper shoots at concertgoers from a Las Vegas hotel room; killing 59, injuring 527
Oct 1	France	ISIS-linked man knifes and kills 2 women in Marseille, then shot and killed by Police
Oct 6	Ontario	Mississauga ISIS sympathiser pleads guilty to terrorism charges in NYC bomb plot
Oct 9	California	Wind-driven wildfires in wine country destroy 1,500 homes and businesses and kill 10
Oct 14	California	Worst ever wildfires approach Sonoma; 5,700 homes destroyed; death toll reaches 40
Oct 14	Somalia	Massive truck bombing in Mogadishu kills over 350, injures 400 more, many missing
Oct 17	BC	Ammonia leak at a Fernie hockey arena results in 3 deaths and residential evacuations
Oct 22	Alberta	Areas of Sturgeon County near Edmonton evacuated due to freight train derailment
Oct 24	Quebec	268,000 without power for hours in Montreal due to a failure blamed on human error
Oct 26	Ontario	OPP charge 4 truck drivers for killing 10 people in separate distracted driving collisions
Oct 28	Somalia	Bombing of a Mogadishu hotel and hostage taking kills 23 and injures at least 30
Oct 30	Ontario	Record breaking rainfall around Ottawa floods many homes and causes power outages
Oct 31	New York	ISIS-inspired truck rampage along a Manhattan bike path kills 8 and injures 12