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# Toward Regional Resilience in Toronto: From Diagnosis to Action

Zack Taylor

Western University, [zack.taylor@uwo.ca](mailto:zack.taylor@uwo.ca)

Leah Birnbaum

[leah@leahbirnbaum.ca](mailto:leah@leahbirnbaum.ca)

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# Toward Regional Resilience in Toronto: From Diagnosis to Action

June 2016

Dr. Zack Taylor  
Dept. of Political Science and  
Local Government Program  
Western University  
London, Ontario

Leah Birnbaum, RPP  
Urban Planning Consultant  
Toronto, Ontario



**Western**  
**SocialScience**

Local Government Program  
Centre for Urban Policy and Local Governance

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## About the authors

Dr. Zack Taylor is Assistant Professor in the Dept. of Political Science and Local Government Program at Western University in London, Ontario, and a non-practicing Registered Professional Planner. His research focuses on Canadian and international urban and regional planning and governance issues. As a researcher and research director at the Neptis Foundation in the mid-2000s he managed and executed several substantial research projects on urban development issues in the Greater Golden Horseshoe. His Neptis report *Shaping the Toronto Region* (2008) won a national award for research excellence from the Canadian Institute of Planners. He has served on the OGS's Growth Plan Implementation Advisory Group. Until August 2015 he was Assistant Professor in the Dept. of Human Geography and City Studies Program at the University of Toronto Scarborough.

Leah Birnbaum, RPP, is a consulting professional planner based in Toronto. Her work often engages Ontario's regional growth management plans; she has consulted on growth management policy and conducted research for foundations, the provincial government, and private-sector clients. She has served as a contributing editor to the *Ontario Planning Journal*.

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## Executive Summary

Greater Toronto is recognized as a high-performing urban region. Over the past decade, however, negative social, economic, and environmental trends have emerged that threaten the region's future. On the basis of documentary research and four focus group workshops with a diverse array of professional practitioners, this paper assesses the Toronto region's current assets and vulnerabilities in relation to future risks. The discussion is framed by the concept of resilience—an increasingly popular, yet abstract, concept in urban planning and public administration. This paper proposes, first, that planning and policymaking be directed toward increasing the region's resilience, understood as the diversity and redundancy of social, economic, environmental, and fiscal-governmental systems. Second, it suggests that public resource allocation be guided by what some have called anticipatory governance—the proactive use of scenarios to discover where multiple risks and vulnerabilities intersect, and therefore where returns may be greatest. Finally, the paper suggests that an appeal to improving quality of life rather than to crisis or individual self-interest may be the most effective way to build broad support for long-term investments in resilience-enhancing infrastructure and services.

# Table of Contents

<b>Introduction</b> .....	<b>5</b>
<b>1. Governing for resilience</b> .....	<b>6</b>
What is resilience? .....	6
Types of risk .....	9
Determinants of resilience .....	10
Anticipatory governance .....	14
Summary .....	15
<b>2. The Toronto region: risks, vulnerabilities, and actions</b> .....	<b>17</b>
Assets .....	18
External risks .....	20
Internal vulnerabilities .....	23
Exploring interconnected risks and policy conflicts .....	38
<b>3. The political challenge: selling resilience</b> .....	<b>45</b>
<b>Conclusion</b> .....	<b>48</b>
<b>Appendix: Workshop process and participants</b> .....	<b>50</b>
<b>References</b> .....	<b>52</b>

## Introduction

The Toronto region is at a pivot point. There is a sense that it has arrived on the world stage—that it is a high-performing and rapidly growing global city with an enviable economic, social, and environmental record. Toronto routinely scores near the top of international quality-of-life and business climate rankings. Over the past decade, however, worrisome trends have emerged that may threaten the region’s future performance: rising rates of poverty and socio-economic inequality, lagging innovation and productivity, a growing infrastructure deficit, inadequate social and economic integration of new Canadians, and concern about the adaptability of the region’s built and natural environments to rising energy costs, climate change, and an ageing society. All of these and more pose difficult and unresolved policy dilemmas for all levels of government.

It is in this context that the Project on Regional Resilience was initiated with support from the Ontario Growth Secretariat and the Toronto chapter of the Urban Land Institute to provide an integrated diagnosis of the challenges the region faces and spur creative thinking on how best to respond to them. The investigation of the region’s challenges, assets, and vulnerabilities synthesizes research by academics, governments, and non-profit organizations with the findings of four thematic workshops with diverse groups of professionals selected on the basis of their area of expertise. This project is not a benchmarking exercise. It is not intended to systematically compare the performance of the Toronto region to that of other regions. Indeed, there is no shortage of such city ranking studies (see Taylor 2011). Rather, the intention is to develop a “within-case” perspective on the region’s strengths, weaknesses, and threats.

The discussion is framed in terms of *resilience*. Resilience is a useful approach to urban policy because it recognizes complexity, interconnectedness, and uncertainty, all of which cloud the ability of planners and policymakers to anticipate, mitigate, or otherwise respond to present and future challenges. Although resilience is an increasingly influential concept in public policy and planning, it is often discussed in the abstract and there are divergent perspectives on its practical application. In addition to exploring Toronto’s current conditions and future potential, this paper also contributes to local and international debates in planning and public policy by presenting a practice-oriented model of urban resilience.

The paper places special emphasis on policymaking for the built and natural environments for two reasons. First, the physical city, with its buildings, roads, rails, pipes, wires, and open spaces, is the container for social and economic life. The construction of the urban built and natural environment is a largely irreversible process. As its structure shapes human behaviour—how we live, interact with others, move, work, and play—and, ultimately, prosperity and quality of life, it is important that planners and policymakers make the best possible decisions regarding its design. Second, the project was initiated in the context of a now completed coordinated review of provincial land-use policies

(Ontario 2015). To contribute to the review, a series of focus-group workshops with expert practitioners was financially supported by the Ministry of Municipal Affairs and Housing with a Places to Grow Implementation Grant. An earlier draft of this paper was presented to the Ministry as an input to the review.

The remainder of the paper is divided into three parts. **Part 1** lays out a practice-oriented definition of resilience and how it can be applied in public policy for urban regions. On the basis of the practitioner workshops and background research, **Part 2** uses the resilience framework to inventory the Toronto region's assets and vulnerabilities in relation to future challenges, with a particular focus on the built environment. Finally, **Part 3** draws on the workshop discussions to reflect on the political challenge of selling resilience to a skeptical public. The paper concludes with a reflection on applying resilience-oriented planning and policymaking in the Ontario context.

## 1. Governing for resilience

Governments, private-sector consultants, non-profit organizations, and academics have in recent years embraced *resilience* as an organizing principle for urban policy and planning. The term is used in different ways, however, so it is worth examining its meaning.

### What is resilience?

The application of resilience to the urban and metropolitan contexts is a recent phenomenon that has emerged from a variety of sources. In the natural and applied sciences, resilience is conceptualized as a measurable intrinsic property of a substance or system (see Holling 1996). Engineers have long studied the relative capacity of materials to return to their original state after being exposed to stress. Biologists and ecologists have examined how ecosystems maintain their essential functions despite disturbance. Psychologists have studied the determinants of the capacity to respond to stress and trauma of individual people and in particular children (Werner 1989). Social scientists' application of resilience is often more metaphorical. Economists and economic geographers have studied the determinants of urban economies' rapid recovery and growth in the context of recession (Christopherson, Michie, and Tyler 2010; Pike, Dawley, and Tomaney 2010). Similarly, resilience has emerged as a guiding concept in natural disaster preparedness. There is some evidence of convergence among approaches. For example, socio-ecological systems researchers have probed the interaction of human society and natural environments, particularly in relation to climate change adaptation (Boyd and Folke 2012).

*Urban* resilience—the resilience of cities, broadly defined—is typically portrayed as a property or capacity of urban economies, societies, and environments. For example, the Urban Land Institute's Urban Resilience Program, the Brookings Institution and the

MacArthur Foundation's Building Resilient Regions Network, the UN Office for Disaster Risk Reduction, and the European Union's TURAS project, among others, have used resilience as a metaphor to explore the determinants of an urban region's successful response to predictable and unforeseen challenges. By understanding the determinants of resilience, decision makers can assess and design policies to remedy gaps in preparedness. The research varies, however, on how it characterizes the operation and outcomes of resilience.<sup>1</sup>

Three versions of resilience are visible in the literature.

1. **Resilience as the capacity to bounce back to normal from external shocks.** The simplest definition of resilience is the capacity to “bounce back” to an initial state after experiencing a traumatic event. In essence, resilient cities may bend under stress but do not break, and come out much as they were before. In her book *The Resilience Dividend* (2014), Rockefeller Foundation president Judith Rodin defines resilience as the capacity to “prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience” (3). In this vein, the Brookings Institution's Metro Monitor project measures whether U.S. metropolitan areas have returned to their pre-recession levels of total employment, unemployment rates, economic output, and average house price (Friedhoff and Kulkarni 2014). Focusing on natural disaster, the International Council for Local Environmental Initiatives defines resilience as the ability to “absorb disturbances while retaining the same basic structure and ways of functioning” (ICLEI n.d.). Similarly, the Urban Land Institute defines resilience as “the ability to define and plan for, absorb, recover from, and more successfully adapt to adverse events” (McCormick and Marshall 2015: 2). The policy objective in this context is to minimize the potential impact of a shock, such as a 100-year flood, by “hardening,” or increasing the robustness of, infrastructure systems.
2. **Resilience as the capacity to be positively transformed by shocks and stresses.** Resilience has also been defined as the capacity to transform, or “bounce forward,” through crises, arriving at a new stable state that is different from before. For example, a resilient urban economy may be restructured by recession, but attain higher employment and labour market productivity in the medium to long term. The policy objective in this case is to create incentives and transitional supports, and make capital investments that encourage positive transformation. For example, governments have encouraged the formation of higher-value-added manufacturing activities by subsidizing training and skills development, creating tax incentives for venture capital investment, and constructing new infrastructure.

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<sup>1</sup> For an comprehensive review of the urban resilience literature, see Meerow et al. (2016).

These are typically described as “equilibrium” models. Both imply that there is stability before and after the city experiences an external shock, and that resilience is a capacity that determines how quickly it returns to its previous stable condition, or a new one.<sup>2</sup> The policy and governance challenge is to anticipate potential shocks and recover quickly when they occur. A third conceptualization of resilience takes a different approach, drawing from ecosystem theory to reject the notion of stable equilibrium altogether:

3. **Resilience as a capacity to adapt to risks and uncertainty.** Resilient cities are *complex adaptive systems* that continuously adapt to changing conditions. Rather than planning for or engineering an optimal future end-state, the governance challenge is to accept uncertainty. Policymaking is a learning process of assessing and managing risks, while remaining open to a range of possible futures (see Walker and Salt 2012).

Understanding the city as an adaptive system means recognizing the *interdependence* of its components. The functioning and performance of the economy, society, and built and natural environments are connected in complex ways, and so change in one domain will have expected and unexpected ripple effects in others. Managing risks requires an appreciation of complexity and the potential for unanticipated consequences. It is in this vein that we offer this definition of regional resilience:

A resilient urban region is one in which public and private authorities have the capacity to strategically prepare for unexpected future risks while managing avoidable ones. The governance challenge is to create institutions and make policies that anticipate and adapt to both slow-moving and sudden changes, while recognizing the complex interdependencies between a region’s social organization, economy, built and natural environments, and governance.

### **Is resilience the same as sustainability?**

Importantly, resilience is conceptually distinct from another buzzword, *sustainability*. In the Brundtland Commission’s (1987) classic definition, “sustainable development ... meets the needs of the present without compromising the ability of future generations to meet their own needs.” Sustainability is therefore about the wise management of resources to keep things much as they are. It is possible to be sustainable without being resilient, although in the context of resource depletion and climate change it is often argued that sustainability is a prerequisite of resilience (see Atmanagara et al. 2013; Newman, Beatley, and Boyer 2009; Newton and Doherty 2014).

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<sup>2</sup> Pendall et al. (2010) characterize these as the single-equilibrium, or “engineering” model, and the multiple-equilibrium, or “ecological” model, respectively. Chandler (2014: 5–6) views the first two “equilibrium” models as versions of what he calls “classical” resilience.

## Types of risk

Up to this point risk and uncertainty have been discussed in the abstract. If resilience is the foundation of an urban region's capacity to manage risks and cope with uncertainty, it is necessary to sketch out what these might be. To do so, we must make distinctions between *sudden shocks* and *slow shifts*, and also between *internal* and *external* sources of risk and uncertainty.

*Sudden shocks* are discrete events that put stress on existing urban systems. These may include extreme weather events, economic crisis, or the failure of critical infrastructure. *Slow shifts*, by contrast, are slow moving or cumulative sources of stress. These may include climate change, long-term economic restructuring processes, demographic shifts, pollution, and the ageing of buildings and infrastructure.<sup>3</sup> Sudden shocks and slow shifts can be driven by internal or external processes. *Internal risks* and sources of uncertainty are generated by the urban region's characteristics, while *external risks* come from outside. **Table 1** lists examples of each permutation.<sup>4</sup>

Chelleri et al. (2015) write that resilience-building necessarily engages multiple spatial scales and time horizons because risks manifest at different speeds and over different territories. Individuals, households, neighbourhoods and urban regions are subject to transnational and even global economic and social forces as technological change increases the connectedness of places and accelerated flows of capital, goods, and labour. This perspective suggests that vulnerability increases at smaller scales. To be sure, local and provincial policymakers have varying degrees of influence over each of these categories of risk. They have no influence over large-scale external processes such as macroeconomic shifts or climate change, although they may be able to anticipate and mitigate their impacts. Provincial, regional, and local governments have more direct influence over internal factors, such as the state of infrastructure and land use. Unlike capital, labour, and goods, the built environment is immobile. It is this immobility that makes it both vulnerable to external risks and the key to their mitigation.

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<sup>3</sup> The distinction between sudden shocks and slow shifts corresponds to Pendall et al.'s (2010: 80) contrast between "acute shocks" and "chronic slow-burn" challenges.

<sup>4</sup> The boundary between internal and external risks may be blurry. A communicable disease such as measles, for example, is more likely to be imported from outside than originate locally, however its spread in the local population is a function of internal factors, such as vaccination rates and population density. Also, we must recognize that some sudden shocks are the cumulative effect of slow shifts. To cite some examples, a housing shortage may be a product of demographic change, an extreme weather event or flood may be the result of climate change, and a catastrophic bridge collapse may be the outcome of long-term underinvestment in infrastructure maintenance.

**Table 1: Types of risk**

	<b>Sudden shocks</b>	<b>Slow shifts</b>
<b>Internal</b>	<ul style="list-style-type: none"> <li>• Infrastructure failure</li> <li>• Epidemic</li> <li>• Human-made disaster (e.g., industrial pollution event, train crash)</li> <li>• Closure of a large employer</li> <li>• Civil unrest (e.g., intergroup violence, rioting)</li> </ul>	<ul style="list-style-type: none"> <li>• Rising poverty and socio-economic polarization, declining social mobility</li> <li>• Increasing traffic congestion</li> <li>• Ageing infrastructure and building stock</li> <li>• Urbanization of rural land</li> </ul>
<b>External</b>	<ul style="list-style-type: none"> <li>• Natural disaster (e.g., earthquake)</li> <li>• Extreme weather event (e.g., hurricane)</li> <li>• Economic recession</li> <li>• Liquidity crisis</li> <li>• National politics and policy (e.g., sudden changes in monetary policy, interest rates, tax rates, fiscal choices, immigration policy)</li> <li>• International politics and policy (e.g., trade war, military action, terrorist attack)</li> <li>• Currency appreciation/devaluation</li> <li>• Rapid change in energy prices</li> <li>• Transformative technological innovation</li> </ul>	<ul style="list-style-type: none"> <li>• Macrodemographic change (e.g., ageing society, declining household size)</li> <li>• Changing societal norms and values</li> <li>• Changing volume and sources of domestic and international migration</li> <li>• Climate change (e.g., rising sea levels, rising temperatures, drought)</li> <li>• Invasive species</li> <li>• Macroeconomic restructuring (e.g., deindustrialization, shift to service economy)</li> <li>• Resource scarcity or depletion (e.g., fossil fuels, industrial commodity inputs)</li> <li>• Accumulation of pollutants in air, water, land, plants, and animals</li> </ul>

Identifying risks is a necessary precursor to mitigating them, however this occurs in an environment of *temporal uncertainty*. The future is to some extent unknowable. The more distant the time horizon, the greater the uncertainty. Still, the cumulative nature or potential “long tails” of decisions must be taken into account. Reflecting on his prior work on the Greater Toronto Airport Authority’s long-term plan for Pearson Airport, workshop participant Toby Lennox put it this way: “We didn’t know what would happen in 50 or 100 years. The one thing we did know is that if we didn’t get the first 20 years right, the next 20 years wouldn’t really matter, because we’d be playing catch up anyway.”

### Determinants of resilience

A review of recent academic and professional literature in economic geography, disaster preparedness and recovery, international development, and urban and regional planning shows that an urban region’s resilience is a product of its social, governmental, economic, and physical characteristics. Consider the archetype of the sudden shock: the natural

disaster. Rapid recovery requires an honest and competent public administration that can maintain social order and allocate resources in times of crisis. Mitigation prior to the event is equally important: the planning and construction of built environments and infrastructure systems that minimize damage. Recovery is also aided by social cohesion: networks and institutions outside of government that facilitate cooperation among strangers. Campanella and Godschalk (2012), for example, compare two large-scale power outages that occurred in New York City. In the 1965 blackout, which occurred in a time of economic growth and optimism, “strangers aided one other in the streets and the city was enveloped by a sense of collective goodwill and common purpose” (218). Twelve years later, in a time of economic decline and social conflict, a second citywide blackout sparked widespread looting and other lawlessness. Social cohesion, supported by prosperity, mattered.

**Table 2** lists commonly cited characteristics of socially, economically, and environmentally resilient urban regions. As in the New York City example, these characteristics are viewed as complementary. Cities with strong social capital; stable, efficient, and honest public administration; a diversified economy; flexible labour markets; and well-maintained infrastructure perform better in times of economic recession. Cities with robust land-use and infrastructure planning and efficient public administration are better prepared for, and respond more effectively to, natural disasters.

Many of these characteristics can be viewed as products of two factors: redundancy and diversity. *Redundancy* is the notion that systems configured as networks are better able to function under stress than those configured as hierarchies or chains. If one part of a network fails, the load can be transferred to another part; if the weakest link in a chain breaks, the failure is complete.

*Diversity* is also important. Drawing on his expertise in electricity production and transmission networks, workshop participant Andrew Pietrewicz remarked that redundancy without diversity accomplishes little, because duplicates of the same system component will fail when subjected to the same stress. “Redundancy is a pillar of resilience,” he said. “But it is only sensible when it is linked to diversity as well. There has to be a diversity of options. Otherwise the one feature is simply twice as vulnerable.” For this reason, energy planners seek to diversify energy sources to ensure consistent supply while creating multiple redundant transmission lines to ensure that delivery can continue even if some fail.

While this logic is often applied to physical distribution systems for networked goods such as natural gas, water and sewer, wired and wireless communication, and mobility systems, it also applies to administrative and decision-making structures. Resilient public- and private-sector organizations are capable of efficiently foreseeing and making sense of challenges and allocating resources to mitigate them (Sutcliffe and Christianson 2011). Without redundant and diverse capacities for decision-making, communication, and implementation, institutions may be reactive rather than proactive and fail to learn from

experience. Worse, they may be ineffective or even collapse in times of crisis (Sutcliffe and Vogus 2003). In the workshop discussion, Aderonke Akande spoke about recent work through the City of Toronto’s Tower Renewal program that aims to formalize some of the structures of support that have emerged organically in some tower communities. During the ice storm in the winter of 2014–2015, some communities experienced long power outages. Building managers and tower residents set up stations with generators, provided food, and checked on people who were isolated in their units while the elevators were down. The City is drawing lessons from this community-level organizing to ensure that the resilience those communities demonstrated during a time of crisis can be shared with others, and built upon to minimize future risks and enhance people’s quality of life.

**Table 2: Commonly cited characteristics of resilient cities**

<b>Social</b>	<b>Governmental/ Fiscal</b>	<b>Economic</b>	<b>Physical/ Environmental</b>
<ul style="list-style-type: none"> <li>• Social cohesion / social capital</li> <li>• Social mobility / relative income equality</li> <li>• Access to affordable housing</li> <li>• Access to education</li> <li>• Access to social supports and health care</li> </ul>	<ul style="list-style-type: none"> <li>• Political stability</li> <li>• Rule of law</li> <li>• Honest government</li> <li>• Efficient public administration</li> <li>• Redundant communication and emergency response capacities</li> <li>• Awareness of risks, assets, and vulnerabilities</li> <li>• Integrated decision making processes</li> <li>• Fiscal capacity</li> <li>• Flexibility (capacity to dynamically reallocate resources)</li> <li>• Broad public participation</li> </ul>	<ul style="list-style-type: none"> <li>• Locational advantage (factor endowments, proximity to markets)</li> <li>• Agglomeration economies (city size)</li> <li>• Diverse economic base</li> <li>• Skilled and productive labour force</li> <li>• Well-maintained infrastructure</li> <li>• Low energy costs</li> <li>• Low transportation congestion costs</li> </ul>	<ul style="list-style-type: none"> <li>• Advantageous location</li> <li>• Proximity to markets</li> <li>• Access to potable water</li> <li>• Food security</li> <li>• Robust long-term land-use planning</li> <li>• Adaptable land-use patterns</li> </ul>

Redundancy and diversity are a hard sell in today’s political environment in which public-sector efficiency is identified with the elimination of overlap and duplication and the construction of “lean” processes and organizations. An alternative way of thinking about redundancy and diversity is to shift the focus from costs to returns on investment. To do so, we can borrow a concept from the financial world: the *portfolio* as a risk management

tool. Investment portfolios are designed to minimize risk to future returns by diversifying the financial instruments they contain. For example, much like a mutual fund, an infrastructure network such as an electricity grid or transportation network can be thought of as a portfolio of assets that is resilient to stress by virtue of its internal diversity and redundancy.

### **Can resilience be measured?**

Several think tanks and consultancies have developed or are developing quantitative indices of resilience with the goal of comparing cities. The Rockefeller Foundation in partnership with Arup International Development has developed a City Resilience Index that measures cities' capacities to respond to stresses and challenges (Arup 2014b, 2015). Similarly, London-based real estate firm Grosvenor has published indices of city vulnerability and adaptive capacity that combine to form a city resilience index score (Grosvenor 2014). The MacArthur Foundation and the Brookings Institution supported the Building Resilient Regions project at the University of California at Berkeley, which developed a Regional Capacity Index for all 361 American Metropolitan Statistical Areas (MacArthur Foundation n.d.; Weir et al. 2012). In each case, a composite index score is calculated from a range of variables, some of which are derived from publicly available statistics, and others from subjective assessments.

A related endeavour is the assessment by insurance companies of external risks to city-regional economic output (Reguly 2013; Sundermann, Schelske, and Hausmann 2013). Lloyd's City Risk Index, which is based on analytic techniques developed at Cambridge University, calculates the potential value of GDP that would be lost in 301 cities between 2015 and 2025 due to 18 human-caused and natural threats, including draught, extreme weather event, pandemic, cyber-attack, earthquake, and nuclear accident (Lloyd's 2015).

Toronto and other Canadian cities score relatively well on these indices. Toronto and Vancouver score first and second, respectively, in the Grosvenor city resilience index, which included 50 cities. Due to its anemic recovery from the Great Recession, Toronto scored only 117<sup>th</sup> of 300 in Brookings' 2009–14 Global Metro Monitor—better than Vancouver (132<sup>nd</sup>) and Montreal (184<sup>th</sup>), and about the same as Calgary (115<sup>th</sup>). Lloyd's estimates that \$16 billion, or 6%, of Toronto's GDP is at risk to disaster—similar to Boston and Atlanta, but considerably less than New York or London. According to their model, market crash, cyber-attack, and pandemic are the three largest risks Toronto faces.

While these benchmarks may reveal variation over time and between cities, we suggest that the greater promise of the resilience concept is to inform anticipatory policymaking.

## Anticipatory governance

Adopting a portfolio approach challenges policymakers and planners to rethink established processes and practices. Traditionally, our approach has been to “predict and plan”: to identify a preferred outcome or end-state and allocate resources to make it happen.<sup>5</sup> As Ahern (2011: 341) puts it, conventional planning has “tended toward a static conception—where sustainability was envisioned as a durable, stable, sometimes formulaic ‘fail-safe’ urban form or condition that—once achieved—could persist for generations.”

One danger of working toward a singular future outcome is the failure to anticipate unforeseen risks that may derail it (Hall 1980). Consider the example of Sydney, Australia, which in the 1960s prepared a plan that allocated future population and physical urban development under prevailing assumptions about average household size. Within a decade, average household size had dramatically declined due to broad societal changes, including the feminization of the workforce, availability of birth control, longer lifespans, and so on. The result: while the population forecast proved accurate, mature suburban areas were occupied at 80% of initial planned densities, with obvious implications for service demand (Meyer 2003). Another case of faulty assumptions generating long-term unintended consequences is that of Minneapolis–St. Paul, Minnesota, whose regional planning agency in 1964 forecast a population of four million by 2000—1.3 million more than what actually occurred (TCMPC 1964). The Twin Cities pursued highway system expansion on this basis during the late 1960s and 1970s. As a result, the region’s transportation infrastructure was oversized, consuming fiscal resources that might have been allocated to other needs. By the time authorities in New South Wales and Minnesota became aware of the gap between their forecasts and reality, considerable public and private resources were committed and it was too late to redirect them.

An alternative approach to “predict and plan” is *anticipatory governance* or *foresight* (Boyd et al. 2015; Quay 2010). Rather than identifying and working in a linear fashion toward a predetermined end-state, anticipatory governance entails evaluating policies and investments in terms of their compatibility with the widest range of potential futures. An increasingly popular technique for assessing future risks and uncertainty is *exploratory scenario planning* (Quay 2010; Roberts 2014; Tewdwr-Jones and Goddard 2014; Wihbey 2016). Instead of envisioning the most desirable outcome, projecting forward on the basis of current trends, or forecasting the most probable scenario, exploratory scenario planning entails the construction of worst-case, unacceptable, and acceptable scenarios. New York City’s Panel on Climate Change, for example, devised multiple evidence-based scenarios premised on different levels and rates of change in air temperature, annual precipitation, sea

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<sup>5</sup> Indeed, the foundations of the 2006 Growth Plan for the Greater Golden Horseshoe are the visioning by the 2002–03 Central Ontario Zone Smart Growth Panel and the population, housing, and employment forecasts in the 2005 Growth Outlook prepared by Hemson Consulting. Similar processes of spatially allocating forecast growth in line with a normative vision underlie regional plans in Vancouver, Calgary, and almost every other growing city.

level, and extreme hot and cold weather and precipitation events. These were then used to “stress test” social and infrastructure systems. Those that performed the least well under multiple scenarios are prioritized for investment. This logic could be taken further by incorporating change in other variables, including labour market participation, energy costs, housing costs, and so on. Similarly, the Great Lakes Futures Project employed scenario analysis to assess the long-term impacts of eight social, economic, and environmental drivers on the basin (Creed et al. 2016; Creed et al. 2015).

Accommodating uncertainty means devising policy frameworks, institutions, physical environments, and infrastructure systems that can *adapt*, or continue to function, under a range of possible future conditions. For example, we might ask whether Ontario municipalities are facilitating the creation of new neighbourhoods, subdivisions, and settlement areas whose urban form and supporting infrastructure will perform well for their residents if energy costs dramatically increase, extreme weather events become more frequent, the economic base changes, or the population’s demographic profile shifts. In the workshop discussions, participants expressed concern that building adaptability and flexibility into policy would translate into more frequent policy changes, undermining investment certainty and driving up development costs. Policies and plans are quite sensibly subject to mandatory periodic reviews that provide opportunities to reassess policy objectives and instruments. Still, those with long-term financial investments in urban development have a strong interest in reducing their exposure to risk and uncertainty, including changes to the “rules of the game.” The approach to long-term urban planning and policymaking presented here is expected to increase, rather than decrease, policy stability by “pricing in” long-term risks and sources of uncertainty. A policy framework that accommodates a range of possible futures will require less amendment over time because it is designed to adapt to changing conditions.

Finally, policymaking through a resilience lens requires that planners recognize that complex interdependencies are a source of uncertainty and that addressing them may have unanticipated consequences or perverse impacts. Workshop participant Tom Smith advised that policymakers and planners should adopt Hippocrates’ dictum to “do no harm.”

## Summary

Resilience is a popular buzzword in urban planning and policymaking, particularly in the fields of emergency management and climate change. Its meaning, however, is vague. We define resilience not as a desirable end-state, but as a *governing strategy for risk management* under considerable uncertainty. We distinguish between two types of risks: *sudden shocks*, including extreme weather events or economic recession, and *slow shifts* such as demographic change. These may be viewed as *internal* and *external* to the urban region. Local authorities are likely to have more influence on internal sources of risk. Much as in investment finance, the urban region should be viewed as *portfolio* of assets whose collective

redundancy and diversity contribute to its resilience. The goal of resilience-oriented policymaking should be to foster these characteristics at a variety of scales and across domains. The process of resilience-oriented policymaking is *anticipatory governance*: the use of exploratory scenario analysis to determine which policy interventions will produce an urban environment that will perform well under the maximum range of potential future conditions. This is distinct from conventional “predict and plan” approaches, which identify a singular desired future outcome and work toward creating it.

### **Whose resilience? Resilience for whom?**

The concept of resilience has been criticized on several grounds. Social theorists have noted that a basic condition of modern life is a “risk society,” one that simultaneously embraces and resists the risks associated with rapid change (Beck 1992; Giddens 2002). In this context, some see the emergence of resilience discourse as related to the contemporary atmosphere of heightened global economic, social, and political turbulence and environmental threats, as well as a political-ideological context favourable to limited government, devolution of authority, and individual and community self-reliance (Amin 2013; Beilin and Wilkinson 2015; Fainstein 2015; Shaw and Maythorne 2011; Welsh). In connection with the latter, there may be a political tendency to use resilience (in the sense of “bouncing back”) to defend a suboptimal or unjust status quo. Framing urban resilience as a product of social capital or the strength of social bonds may also serve as a cover for governments to “de-socialize” risks by privatizing or transferring welfare-state functions to individuals or households. Moreover, Jabareen (2015) notes that control over the identification and prioritization of risks, as well as the allocation of resources in response to them, is itself a source of power. For this reason, most emphasize inclusive and collaborative urban governance processes (Goldstein 2012).

Recognizing these criticisms, we propose that resilience is a potentially useful guide to policymaking insofar as it foregrounds underappreciated sources of uncertainty and the complex interconnections among social, economic, environmental, and fiscal variables.

## 2. The Toronto region: risks, vulnerabilities, and actions

Mounting an anticipatory governance process for the Toronto region is beyond the scope of this project. We saw an opportunity, however, to contribute to public debate on the health and future of the region and, more specifically, to the Ontario government's coordinated review of its Toronto-region land-use planning policies by conducting a holistic assessment of assets and vulnerabilities in relation to known risks. Toronto is correctly hailed as a high-performing region, yet over the past two decades local foundations, academic researchers, and others have independently catalogued a range of negative indicators and trends.

This section synthesizes some these disparate findings with discussions that emerged in four workshops held in February 2015 with financial support from the Ontario Ministry of Municipal Affairs. Each workshop focused on a theme: the economy, society, the built and natural environments, and fiscal health. Twenty-eight professionals with experience in a broad range of issues were invited to participate (see **Appendix**). Many of the participants came from outside the traditional constituencies of land-use planning. In addition to planners, architects and urban designers, developer-builders, and environmentalists, the roster of participants also included practitioners and experts in social-service delivery, geriatric care, economic development, housing market and demographic forecasting, fiscal policy, and the design and finance of infrastructure projects. Workshop participants represented themselves, not their organizations or employers, and their remarks presented in this paper are their own.

Each was asked to consider three questions:

1. What risks, threats, and uncertainties do the Toronto region face over the medium and long terms?
2. What are the region's principal assets and vulnerabilities that may improve or undermine its capacity to anticipate and respond to these challenges?
3. And what interventions are required to improve this capacity?

Taken together, the workshops elicited a wide range of often provocative opinions and arguments. They also revealed interesting, and sometimes surprising, connections and points of consensus. At the same time, the discussion illustrated what one anthropologist has called the Rashomon Effect, after the Japanese film in which different characters interpret the same events in different ways (Heider 1988). The housing developer, the economist, the social worker, the medical doctor, the environmentalist, and the public finance expert are all centrally concerned with urban development and its impacts, yet each understands it in different terms.

Much has occurred since the workshops were held. Most obviously, the 2015 federal election revealed a public appetite for broad-based infrastructure investment that

was not foreseen by workshop participants. Debates over the causes of and solutions to metropolitan housing affordability crises have intensified. And in the aftermath of the Paris Conference on Climate Change, federal-provincial relations now revolve around the linkage between climate change mitigation strategies and the future of Canada's natural resource economy. We acknowledge these and other changes and events in the discussion.

## Assets

Toronto's social sustainability and economic growth stem from a range of natural and human-made assets. As Juan Gomez put it, "in this region we ... have the right fundamentals: education, transportation, infrastructure, openness to business, and the ability to expand and attract workers who can find housing."

**Location, natural endowments, and proximity to markets.** Greater Toronto derives stability and security from its location and natural endowments. Located near the border with the United States means that Toronto is within one day's drive or a short flight of approximately one-third of the North American population. Southern Ontario also benefits from being located far inland, yet with uninterrupted access to Atlantic sea routes via the St. Lawrence Seaway. This gives Toronto a climate-change advantage—about 13% of the world's urban population lives in low-lying coastal areas vulnerable to rising sea levels. The inundation of coastal areas will displace tens of millions of people and disrupt economic production and trade (Satterthwaite et al. 2007). The Toronto region also benefits from direct access to abundant fresh water, of which the Great Lakes account for 20% of the world's supply. Finally, although the growing season is shorter than in the American heartland, the food security of the Greater Golden Horseshoe, and Southern Ontario more generally, is supported by abundant productive farmland.

**Agglomeration, growth, and economic diversity.** In the workshop discussion, architect Martin Sparrow, whose career has been primarily in Alberta, favourably compared Toronto's economic diversity to Calgary's oil-driven boom-bust cycle. The Toronto region emerged in the early postwar period as Canada's preeminent manufacturing and service-sector hub, supported by consistent investment in comprehensive infrastructure systems, including highway, bus, and subway networks, and lake-based water and sewer systems, as well as integrated industrial and business parks planning. This facilitated economic diversification—while the region has large automotive, pharmaceutical, and financial services sectors, it is not dependent on any one of them. By virtue of its sectoral diversity, Toronto evaded the postwar economic decline of the nearby "rustbelt" cities of the Upper Midwest and Northeastern states (King, Hracs, and Denstedt 2010: 1–4).

The Toronto region's greatest assets may be its size and consistent growth. The population of the Greater Golden Horseshoe has increased by an average of one million

residents in each decade since 1950. The provincial government forecasts that this will continue, fuelled almost entirely by international immigration. By 2040, the Greater Golden Horseshoe is expected to have a population of 13.4 million, up from 7.8 million in 2000. About three-quarters of this growth is forecast to occur in the Greater Toronto and Hamilton Area (GTHA). This translates into national “heft.” The Greater Toronto Area (not including the outer ring of the Greater Golden Horseshoe) accounts for 20% of Canada’s GDP, and 45% of Ontario’s.

Population increase is an asset in and of itself because it grows the economic and fiscal pie: new residents are also new workers and taxpayers. Economists have shown that economic growth correlates with both sectoral diversity and the agglomeration of population and businesses—in essence, that growth begets growth (see Glaeser 2010; Krugman 1991; Wolfe 2014). As Matthias Sweet noted, “The single biggest asset that the Toronto Region has is a large labour pool. And this large labour pool gives us this capacity for people to find their optimal jobs and for employers to find their optimal labour.” In short, Toronto’s agglomeration enables it to be diverse and specialized at the same time—the very definition of a redundant and diverse portfolio of economic assets.

**Political stability, tolerance, and diversity.** Toronto’s growth has been sustained by its relative stability. Canada is recognized as possessing exceptional political stability and low crime rates even compared to other developed countries. (Indeed, Canadian cities’ high rankings in the Grosvenor Resilience Index and other business climate and quality-of-life indices stem in large part from domestic political stability, lack of corruption, and rule of law.)

Toronto’s stability and tolerance make it attractive to migrants and international investors. In fact, diverse international migration has driven the region’s economic agglomeration and diversification. A societal consensus in favour of large-scale immigration sets Canada apart from most other democratic countries. Indeed, Canada may be the only immigrant-receiving country without a mainstream anti-immigration political party. While accepting approximately 100,000 international migrants per year and becoming one of the most ethno-linguistically diverse cities in the world, the Toronto region has experienced little of the large-scale social and political conflict or civil unrest seen in other cities. Evidence is accumulating that Canadian urban housing markets—principally Vancouver’s but also Toronto’s—have become safe places for international investors to park capital at a time when returns are low and a weak Canadian dollar reduces costs to external buyers (Canada 2016; Duggan 2016; Ireland 2015). Toronto’s historical capacity to receive and integrate international migrants is facilitated by its existing diasporic communities. As Peter Thoma put it, “people looking for where to go in the world will start with their own personal networks, and those networks exist in Toronto.”

Some workshop participants proposed that Toronto may benefit from problems elsewhere in the world, including population displacement due to war, inter-group conflict, natural disaster, climate change, and economic and political uncertainty. Indeed,

the World Bank (2016) has made several dire forecasts: that water scarcity alone may reduce GDP in Africa, the Middle East, and East Asia by as much as 14% by 2050; rising prices for food and clean water will blunt global poverty reduction; and draught and natural disaster will spark resource-driven armed conflicts. Toby Lennox argued that Toronto should market its stability to global corporations who may be looking to shift production and supply chains to locations less susceptible to long-term risks, including political instability and climate change.

**Relative prudence in a favourable fiscal environment.** Collectively, Canadian governments have considerably more spending and borrowing capacity than they did 20 years ago, the latter enhanced by historically low interest rates. Total government spending nationwide decreased to 39% of GDP in 2014 from 53% in 1992. The total government debt-to-GDP ratio (again, all levels) declined from over 100% to about 66% in 2007 as the federal and many provincial governments brought their budgets into balance in the late 1990s and 2000s through a mix of expenditure reductions and tax increases (Crowley, Murphy, and Veldhuis 2012). Nationally, stimulus measures drove the total government debt-to-GDP ratio up to 86% in 2014. Despite this uptick, the debt burden is considerably less than in similar economies. Overall, the municipal fiscal balance sheet is healthy. Municipal governments are forbidden to run operating deficits, and collectively have plenty of room to borrow for capital projects (Bazel and Mintz 2014). The City of Toronto has voluntarily elected to cap its debt servicing costs well below the province's limit of one-quarter of the operating budget. Canadian governments' fiscal prudence relative to many other countries means that resources are available to pursue resilience-enhancing social, economic, and environmental policy objectives.

## External risks

**Macro-demographic risk: The ageing society.** Last year was the first in which the total number of Canadian seniors exceeded people under the age of 15. The long-term decline in birth rates coupled with longer lifespans means that the average age of the population is increasing while labour market participation rates are declining (Ontario 2014: ch. 1). The Ontario government forecasts that, province-wide, the number of seniors will double in absolute terms by 2035. This will have a variety of interdependent effects.

A growing over-65 population will spur greater demand for senior-appropriate housing and neighbourhood environments. In the United States, seniors have eclipsed young people as the principal driver of household formation (Kolko 2015). With advancing age comes reduced mobility and increased incidence of disease and disability, all of which undermine the confidence and capacity to live independently (Frye 2014; WHO 2007). Neighbourhood-scale barriers to mobility, such as wheelchair-inaccessible pedestrian environments and buildings, pose a profound barrier to independent ageing in

place. Legislated requirements, including under the 2005 *Accessibility for Ontarians with Disabilities Act*, pertain to new construction, but the retrofitting of existing neighbourhoods is often impracticable.

The social isolation of older people will only grow in the coming decades. Samir Sinha noted that “we’re less likely now than 50 years ago to live in intergenerational households or even intergenerational communities. In fact, 23% of older Ontarians tell us that they don’t have anyone close by who can help them with a simple task if needed. That level of social isolation is a big concern.” As people continue to age in place in neighbourhoods that are single-use and car-dependent, the risks associated with social isolation will grow, including increased emergency response needs and health care costs.

A higher dependency ratio (the proportion of young and elderly dependents to income-earners) will put pressure on the tax base. More people on fixed incomes, a substantial proportion of which will be in the form of transfers from governments, translates into higher spending demands and less tax revenue. At the same time, the growing cohort of seniors will generate new demands for health and long-term care expenditures. Governments will also be expected to pay out pension and other benefits to a growing number of former employees. Demographically driven revenue constraints and cost pressures will occur in addition to demands for new spending on growth-related infrastructure and the maintenance and replacement of existing systems. In Greater Toronto, the trend toward an ageing society will be somewhat moderated by immigration, which brings working-age people and youth into the economy.

**Environmental risk: Climate change.** Changes to weather and air and water temperatures pose another category of risk. The increasing frequency of sudden shocks such as extreme weather events, as well as slow shifts such as increasing seasonal temperature variation, will impose direct and indirect costs on households and businesses, especially in cities (Hunt and Watkiss 2011). Floods as a result of high-volume precipitation will stress storm water management infrastructure and increase soil erosion, resulting in increased property damage. The Economist Intelligence Unit forecasts that \$US4.2 trillion of economic value would be at risk globally through the year 2100, should the average temperature rise by 4°C (EIU 2015). Climate-change risks may be anticipated and mitigated, although their precise timing and severity of impact may not be predictable. Insurance companies are already pricing climate change risks into their models (Sundermann, Schelske, and Hausmann 2014; Team Green Analytics 2015).

By the 2040s, the average temperature in the Toronto region is expected to rise by 3.5 to 4°C, increasing with distance from Lake Ontario (Theobald et al. 2011). The University of Hawaii’s Mora Lab projects that in the absence of global mitigation of carbon emissions, Toronto will reach “climate departure”—the year after which the average temperature will exceed the extreme high between 1860 and 2005—in 2047 (Mora 2013). The Toronto Environmental Office and Toronto Public Health forecast that

the number of days with extreme heat (over 30°C) will triple and that the number of annual heat-related deaths could double by mid-century (City of Toronto 2014b). Analysis indicates that air temperatures are highest in high-density areas featuring more impermeable surfaces, which indicates the need to integrate heat mitigation into new and redeveloped built environments (Rinner and Hussain 2011). As temperatures rise, a greater proportion of precipitation will fall as rain rather than snow. There is likely to be considerably less snow in the winter, but precipitation will also be more concentrated, falling in short, high-volume bursts that will challenge existing stormwater infrastructure and run off rather than be absorbed into soil (Theobald et al. 2011).

Globally, fresh water is under stress due to climate change and urban development (UN Water 2014). The Great Lakes will not be immune to climate change effects. While cities on the ocean coasts experience sea-level rise, scientists forecast that in the Great Lakes, rising air and water temperatures will decrease water levels through evaporation, as well as lead to larger and more frequent algae blooms that undermine fish habitats and, potentially, water supplies (Gronewold et al. 2013; O'Reilly et al. 2015). Climate change will also affect the generation, distribution, and demand for energy. One analysis suggests that lower water levels could reduce Ontario's hydroelectric output by 1,100 MW, at the same time that demand for cooling systems will increase (Clean Air Partnership 2011). Heat also reduces the efficiency of long-distance electricity transmission and distribution systems (Aivalioti 2015).

All in all, the localized impact of weather and temperature change on ground- and lakewater supply for urban and agricultural uses, invasive species, ecosystem function, energy supply, and lake-based shipping is uncertain (Gregg et al. 2012). The research suggests that the built environment and infrastructure systems lack the redundancy and diversity to absorb climate change effects.

**Economic risk: Flagging innovation and investment attraction.** Standing in the background are perennial sources of uncertainty: macroeconomic cycles, transformative technological innovations such as automation, change in the terms of trade, energy costs, volatile currency exchange rates, and fluctuations in access to capital. By virtue of strong linkages to continental and world markets, the local and national economies are not islands. Participants in the economy-themed workshop agreed that local residents, firms, and governments have always been, and always will be, to some degree subject to decisions, flows, and forces that are beyond their control.

Frank Clayton raised the spectre of the American Rustbelt to say that even long-term success can come to an end. After dominating global steel and automobile production for generations, the fortunes of many American cities quickly reversed when offshore producers produced more innovative products and undercut them on cost. The collapse of Nortel, which had a large footprint in the Toronto region, and the radical decline of Blackberry, are examples of champions being out-innovated and out-competed. Canadian

exporters know that the exchange rate drives their competitiveness. Canadian goods and services producers came to depend on a weak dollar in the mid-1980s and again in the late 1990s and early 2000s. When the exchange rate rapidly returned to par in 2011–12 for the first time since the mid-1970s, many businesses were virtually wiped out, especially in the manufacturing sector (Oschinski, Chan, and Kobrinsky 2014; Spiro 2013).

Ontario is a magnet for foreign direct investment by market share and dollar volume, topping California and Texas as the largest North American receiving jurisdiction for greenfield projects (FDI Intelligence 2015: 10). While the Conference Board (2012) and others view foreign direct investment as a driver of innovation, productivity, and income growth, FDI also renders local economies vulnerable to decisions by foreign firms whose material interests may lie elsewhere. There is however an unfortunate history of the Ontario and Canadian governments giving foreign branch plants loans and concessions in exchange for production and employment guarantees, only to have those firms use the threat of closure to bargain for more incentives once the agreements expire. Cluster-based economic development strategies may embed mobile capital in the local economy. One participant brought up the case of California-based semiconductor maker AMD, which acquired local graphics processor firm ATI Technologies in 2006. AMD has maintained the Canadian operation because of strong local linkages.

While southern Ontario has benefited from proximity to and integration with the American market in the past, it remains subject to external pressures and sources of uncertainty. The challenge is to ensure the resilience of the regional economy by fostering sectoral diversity and redundant capacities (Wolfe 2010). This points to nurturing a diverse portfolio of clusters that embed talent and investment as opposed to inducing standalone investments with subsidies that may be outbid by other jurisdictions. It also points to the need for investment in hard and soft infrastructures that support skills development and innovation, improve businesses' access to capital, and lower the cost of mobility of people and goods.

## Internal vulnerabilities

**Complacency.** In *The Resilience Dividend*, Rodin (281) concludes that there is less urgency to act in stable times, so governments tend to reactively respond to crises instead of proactively anticipating the future. The governance challenge is therefore to “reduce reliance on crisis as a driver of policy change” (300). Matthias Sweet agreed that slow-burn problems often lose out to crises: “if a problem needs to be loud for it to be worth addressing, that’s problematic because some problems are going to be sexier and some are not.”

Participants in the fiscal- and economy-themed workshops agreed that decades of steady growth and abundant natural assets and locational advantages have bred complacency regarding the region’s social and economic problems. Richard Joy stated that

the Toronto region's relative economic stability during the Great Recession and its legacy assets have "in some ways masked a lot of our larger challenges and allowed us to not face them." Complacency also stems from the relative absence of crisis. Many of the region's vulnerabilities have emerged gradually and many of the risks it faces are long-term and cumulative. It is easier to be complacent about slow shifts than sudden shocks.

**Inadequate strategic regional coordination.** One outcome of complacency is inadequate regional coordination. Several workshop participants decried the region's disjointed local governance, seeing in today's panoply of municipalities a situation analogous to that which existed before the creation of Metro Toronto in 1954. At that time, what is now the City of Toronto contained 13 municipalities within what was then York County; today, the GTAH contains 25 municipalities and the Greater Golden Horseshoe 110. Metro was created to centralize capital borrowing to modernize infrastructure, influence the urban development pattern through infrastructure provision and subdivision control, operate a regional transit system (the TTC), and manage regional roads. It was enormously successful in the 1950s and 1960s (although allowed to wither in the 1970s) because it could borrow at lower interest rates than its constituent municipalities and directly link infrastructure provision to regulatory land-use planning. Frank Clayton believes a new regional government is necessary to coordinate economic, land, and infrastructural development at a broad scale: "My view is to take the census metropolitan area [and] create a [two-tier] government like we used to have in Metropolitan Toronto, with each of the regions and the City of Toronto becoming the lower tier. At least then you'd be doing the planning and financing, everything, on the economic regional basis. And if you don't have that, you're in trouble."

The creation of a two-tier regional government has not been seriously proposed since the Golden task force (GTA Task Force 1996), and local government restructuring has been politically toxic since the provincially imposed amalgamations of the late 1990s and 2000s. Instead, the province has become the *de facto* regional government. Earlier provincial plans to which municipal plans must conform—the Niagara Escarpment (Ontario 1985) and Oak Ridges Moraine Conservation Plans (Ontario 2002)—have been supplemented by the Greenbelt Plan (Ontario 2005) and the Growth Plan for the Greater Golden Horseshoe (Ontario 2006). The province also created Metrolinx, a new regional agency to plan, coordinate, and partially operate transit systems.

The emergence of a durable regional perspective and voice has been stifled, however, by the absence of a regional representative institution through which local leaders can manage intermunicipal conflict and define and solve collective problems. Symptomatic of the lack of a regional perspective is the province's recent abolition, under suburban pressure, of "GTA pooling," through which municipalities in the surrounding regions transferred funds to the City of Toronto to operate social programs. Several workshop participants also argued that intermunicipal competition for investment produces perverse

outcomes. While some employment zones are deserving of preservation, the absence of a coordinated regional employment land strategy means that municipal economic development planning is driven more by the aspirational chase for a lucrative non-residential property tax base than marketplace reality (Blais 2015: 60). Peter Thoma suggested that for municipalities,

preserving employment land has become an end in itself. ... [Municipalities] all have teams of economic development practitioners who are trying to sell their specific community to investment interests. I understand the competitive dimension that exists between neighbouring municipalities within the region. But when you actually look at where the jobs are going and the types of jobs and environments that young people aspire to work in, they're not the kinds of jobs that are on the lands that policymakers are so adamant to protect through land-use controls.

It remains to be seen whether investment attraction strategy will become more regionalized with the impending consolidation of the Greater Toronto Marketing Alliance and Invest Toronto (a City of Toronto agency). Similarly, it is unclear whether Metrolinx will evolve beyond being a planner and operator of regional bus and rail lines to become a more robust coordinator of local transit systems. For example, will the fare system be regionalized, as in Montréal and Vancouver's multi-zone systems, or will crossing municipal boundaries continue to entail paying double fares? Certainly the region-wide adoption of the Presto digital fare card would enable moving to the zone-based collection and sharing of revenues across multiple providers.

At several points in the workshop discussion, participants expressed concern that the logic of electoral competition, as well as political friction between provincial and local governments, have inhibited evidence-based regional planning and the pooling of municipal resources to pursue capital projects and operate services of regional scope and significance. Effective planning and coordination of social, economic, and environmental governance in Greater Toronto hinges on the provincial government actively maintaining its role as the keystone of the regional governance system. Remove the provincial keystone and the system risks tumbling down.

**A “missed generation” of infrastructure investment.** Perhaps the most visible manifestation of complacency is the gradual emergence of the infrastructure deficit. The 1950s–1970s were a golden age of growth-related infrastructure expansion in Ontario. Indeed, much of the stock of highway, transit, water and sewer, and electricity production and transmission infrastructure dates from that period. Since the economic malaise of the 1970s, there has been a tug-of-war between the pressing need for growth-related expansion of infrastructure systems and the maintenance and replacement of existing ones. Nationally, public investment in new and existing infrastructure declined by more than half between

the late 1950s and the early 2000s as a proportion of GDP (Mackenzie 2013). At the same time that the capital stock built during the boom years aged toward the end of its operational life, the proportion of public investment spent on maintenance has declined since the 1990s (Félio 2012; RCCAO 2010: 14).

The result is a local and national infrastructure deficit or, as Tom Smith put, an “infrastructure *debt*, accumulated over a generation.” One recent analysis finds that to maximize hard infrastructure systems’ contribution to GDP growth, Canada would have to increase total national spending on infrastructure by 62% and almost double the proportion going toward maintenance for the foreseeable future. Not doing so would leave 40% of real per-capita GDP on the table (RCCAO 2010: 21–23). Richard Joy estimated that if transportation, housing, electricity, water and wastewater infrastructure are included, Greater Toronto’s capital funding gap may be something on the order of \$4 billion per year.

The infrastructure deficit undermines the region’s economic and environmental resilience. Decaying and inadequate infrastructure discourages business investment, suppresses economic growth, and imposes significant social costs on residents (see, for example, Ragan and Vuong 2015). Lack of investment in a diverse and redundant infrastructure portfolio has reduced economic competitiveness and residents’ quality of life, while inhibiting proactive mitigation of risks associated with climate change and the ageing society. Matti Siemiatycki succinctly summed up the risks associated with a widening infrastructure gap:

I think we’ve clearly missed a generation of infrastructure investment and I think that’s a huge risk. And when I say infrastructure, I mean it really broadly: transportation is the obvious one that everyone talks about, but public housing and a lot of our other infrastructure is decaying. I think we have a problem with both finding the money for these things, but also finding the political will. ... These things are starting to compound. When it comes to productivity: our deficit in terms of infrastructure is contributing to that. When we talk about environmental sustainability, our deficit in terms of infrastructure is contributing to that, and I would also include social equity in there as well.

Instead of occurring incrementally, capital investment tends to be “lumpy,” happening only when breakdowns provoke crisis or governments engage in countercyclical stimulus spending. Hilary Holden and Matti Siemiatycki both argued that major public infrastructure investments are sufficiently infrequent, making each opportunity feel like the last. In such an environment, politicians scramble, “elbows out,” to support local pet projects, leading to *ad hoc* and often suboptimal outcomes. “We are not good at prioritizing regionally or integrating the evaluation of projects into political decisions,” said Siemiatycki. Stop-and-go construction is more expensive than incremental system expansion. This is because expertise and administrative capacities are dismantled and

rebuilt on a project-by-project basis. Building in bursts rather than incrementally also drives up the cost of projects' labour and material inputs. This echoes a recent McKinsey Global Institute report, which argued that global infrastructure demand could be met at 40% less cost if practices were improved: "On the whole, countries continue to invest in poorly conceived projects, take a long time to approve them, miss opportunities to innovate in how to deliver them, and then don't make the most of existing assets before opting to build expensive new capacity" (MGI 2013: 4).

**Self-imposed fiscal incapacity.** The perennial question, of course, is where infrastructure investment capital should come from. As Toby Lennox colourfully put it, "we are smoking something if we think infrastructure is going to come without someone paying for it." Four options are commonly proposed, often in combination: borrowing, raising taxes, capturing increases in land value due to infrastructure expansion, and public-private partnerships. However, the full use of each has been inhibited by political opposition, resulting in self-imposed fiscal incapacity.

It is sensible to fund durable infrastructure with borrowing because the cost can be spread over the lifetime of assets. As noted above, interest rates are low and the governments' balance sheets are in relatively good shape overall. Fiscal capacity is, however, unevenly distributed across levels of government. While economists agree that the municipal sector as a whole can sustainably assume more debt, some growing municipalities, including York Region, have reached provincially imposed borrowing limits. Robert Hatton noted that municipalities are increasing their borrowing capacity while reducing recurring debt servicing costs by issuing longer-term bonds. While 10-year bonds were once the norm, the City of Toronto is now issuing some 30-year bonds—a term still shorter than the expected life of the underlying asset. While the size of annual payments is reduced, this may result in higher overall servicing costs. Most provinces' borrowing capacity is constrained by substantial and increasing debt loads. Ontario has remained in deficit since the Great Recession and, as a result, its net debt-to-GDP ratio increased from 26% to 39% between 2008 and 2016 (Ontario 2016). Given the Ontario economy's pace of growth, this ratio will remain elevated for the foreseeable future (FAO 2015). Given the relatively constrained borrowing capacity of municipal and provincial governments, the federal government may have the greatest capacity to engage in deficit financing for infrastructure expenditure. The new federal government's decision to incur deficits to fund a greater share of infrastructure represents a move in this direction (see box "A more strategic federalism?").

## A more strategic federalism?

Early signs from the new federal government elected in October 2015 suggest that Ottawa's increased spending on infrastructure renewal will be guided by long-term productivity enhancement rather than short-term stimulus, and will be sustained over a long period of time. Ottawa has also signalled that it will increase its funding from one-third to one-half of project costs, an amount more in line with the share of incremental revenue it will receive from productive capital investments, and also give provinces more discretion over how money is spent.

One consequence of federal and provincial retrenchment and municipal governments' resistance to incurring capital debt is the common practice of transferring financial risk to the private sector. Under so-called front-ending agreements, whereby developers agree to finance and install infrastructure systems on their own, the developer takes on debt that would otherwise be borrowed by government albeit at higher interest rates. These costs are then passed the cost on to the consumer. This has two negative effects. First, it drives up rents and prices for residential and employment real estate, with negative social and economic impacts. According to Lloyd Cherniak, another consequence is a dramatic increase over the past decade in the amount of borrowing risk assumed by developers. This has driven up the size of development projects and reduces the number of competitive players in the market. Ultimately, it may lead developers to shift investment to jurisdictions where they are exposed to less risk. There is anecdotal evidence that some large Ontario developers have expanded into other North American housing markets for this reason.

A second option is to increase current revenues. Participants agreed that that governments' general unwillingness in recent years to increase or shift the impact of taxes inhibits our collective ability to meet current infrastructure needs, let alone head off future crises. They also agreed that new revenues lie with new taxes of broad incidence, thereby spreading burdens across the population.<sup>6</sup> In the City of Toronto context, Peter Thoma lamented that politicians have shied away from taking full advantage of new revenue sources conferred by the 2006 *City of Toronto Act*. (The Municipal Land Transfer Tax is the exception, but it exposes the City to potential risk by hitching its fiscal health to the continuation of the housing boom.) Similarly, provincial and municipal governments have ruled out several potential revenue streams identified by business leaders and expert task forces as the most productive, predictable, and equitable ways to fund transit expansion: increases to the income tax, the HST, and the gas tax, and also the introduction of road tolls. Despite moves to raise the top marginal tax rate at the provincial and federal levels, the political conditions of increasing general revenues remain elusive.

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<sup>6</sup> Generally speaking, the incidence of a tax refers to the distribution of its burden across society. Taxes of narrow incidence, such as "sin taxes" on cigarettes and alcohol, are borne by a small segment of society, while taxes of broad incidence, such as the HST and income tax, are paid by almost everyone. A progressive tax skews the burden toward upper-income earners, while a regressive tax's burden falls on low-income households.

A third potential source is to capture growth-related land-value uplift through the property tax or development charges. Workshop participants disagreed on whether land-value uplift would be sufficient or appropriate to cover capital costs. Tom Smith acknowledged that “there is always a [public] cost of development and most of those are fair. And there should be a public benefit from private undertakings.” But, in his opinion, “growth can’t pay for what’s needed now. ... We have to shift away from relying on growth to pay for growth-related infrastructure and the infrastructure deficit.” Similarly, Frank Clayton argued that the benefits of new infrastructure are enjoyed not only by new residents. Rather, benefits are sufficiently dispersed that everyone has a stake in infrastructure expansion. To the extent that it is impossible to disentangle the proportion of infrastructure costs that benefit new versus existing residents, the current emphasis on development charges may be misplaced.

Finally, governments may use public-private partnerships (P3s) to access capital from private investors, pension funds, and sovereign wealth funds to achieve public objectives. Ideally, P3s may not only reduce public debt exposure for large up-front investments, but also create incentives for efficient and timely project delivery and design innovation. Several participants in the fiscal- and economy-themed workshops argued that Ontario has lagged behind other jurisdictions in pursuing innovative financing and governance techniques, including P3s, the use of project management intermediaries to drive innovation, and the use of public corporations empowered to borrow on their own account against future revenues. Toby Lennox argued that pension funds are ready to invest in large projects, particularly in higher-order transit, but that the size of Canadian deals is not large enough and, as a result, there are “large pools of capital going elsewhere.” Siemiatycki and Robert Hatton stressed that the public’s dominant image of P3s as a long-term operating concession over which the public sector has little control, as in the case of Highway 407, has undermined the public image of P3s and does not capture the full range of possibilities (see box “Perils of P3s”).

### **Perils of P3s**

While P3s are framed as transferring financial risk to the private sector, poorly designed contracts may create costly problems. For example, Siemiatycki argued that inflexible long-term contracts may undermine adaptation to changing circumstances. He shared a story of a design-build-finance-maintain P3 in the UK to build schools, where the government became locked into paying for under-enrolled facilities that could not be closed or converted to other community uses. Siemiatycki argued that maximizing public benefits and asset flexibility while minimizing risk can be achieved with shorter contract terms and unbundling design from construction and financing from operating costs. Robert Hatton also said that municipalities should be cautious about “signing away your revenue stream,” as occurred with Highway 407.

The infrastructure deficit has compounded due to the political failure to allocate resources toward necessary expansion, maintenance, and replacement projects. This has undermined the region's social, economic, and environmental resilience. Taxation and debt remain politically fraught as leaders have failed to make the case for funding public investments not only to accommodate and support growth, but also to maintain existing systems.

**Lack of alignment between resources and policy goals.** The provincial government makes decisions regarding new major transportation infrastructure while municipalities are responsible for land-use regulation. Transit lines are being built with the expectation that they will spur the redevelopment of surrounding areas in a manner consistent with broader policy objectives, not least ensuring sufficient ridership to justify the investment and the creation of “complete” communities that incorporate residential, employment, and amenity uses. As Richard Joy and Hilary Holden noted in the workshops, the provincial government has not required municipalities to rezone land as a condition of receiving funding. As a result, infrastructure investment may not deliver on its transformative potential and require higher than expected subsidies.

Similarly, workshop participants brought up examples in which some agencies' priorities worked against land-use goals. Lloyd Cherniak noted that in his experience as a large-scale developer, school board requirements for school yard sizes and one-storey school buildings have had the unintended consequence of consuming more land when developers were being told to design and build communities more densely. “If you want intensification you have to think in terms of public assets as well. Schools are one example; but they are the worst.” Similarly, the location of jobs and amenities in low-density, single-use employment and retail zones separated from residential areas inhibits access by means other than the automobile. Dependence on any one mode of transportation undermines resilience because the overall mobility system lacks diversity and redundancy.

**Lagging economic performance.** The region largely evaded the Great Recession, its population and employment levels continuing to increase. Still, the economy has by some measures been stalled since the early 1990s recession, a quarter-century ago (Boston Consulting 1995; Burleton 2002). As Juan Gomez put it, “we’ve plateaued.” The value of Ontario's exports to the United States has declined over the past decade, in large part due to the erosion of urban manufacturing (TRBOT 2015). Regionally, manufacturing's proportion of all jobs declined by half since the late 1980s (TWIF 2009), and 200,000 manufacturing jobs were lost across the Greater Golden Horseshoe between 2001 and 2014 (Blais 2015: 33). The City of Toronto alone lost 117,000 manufacturing jobs between 1983 and 2013, many of them during the restructuring that followed the adoption of the Free Trade Agreement with the United States (City of Toronto 2014c). (For comparison, banking and financial services employment increased by 78,060 over the

same period.) At the same time, exporting firms that grew too accustomed to the low dollar during the late 1990s suffered when the exchange rate spiked during the western commodity boom.

Despite a large, diverse, and highly educated labour market, studies point to persistently low labour productivity, higher unemployment rates, a weak innovation system, and lagging inward foreign direct investment compared to peer cities, producing a widening “prosperity gap” (Conference Board 2012, 2015; TRBOT 2014a, 2014b). Damian Dupuy voiced concern that the innovation gap may be counting Toronto out of rapidly changing high-value-added sectors such as advanced manufacturing: “We have very low business investment in innovation. Innovation is really anchoring change in manufacturing. It is anchoring change in the global economy and we are not there yet.”

**Rising poverty and increasing inequality.** Poverty rates are higher than in past decades. Particularly concerning is growing child poverty in all parts of the region. Child poverty has very long effects, stunting future educational attainment, earnings, and psychological wellbeing. Between 1990 and 2005 the incidence of child poverty increased from 24% to 32% in the City of Toronto. A half-million children in the City of Toronto live in low-income families (Polanyi et al. 2014). While the rates are lower, child poverty also roughly doubled in Mississauga, Oakville, and Brampton over the same period. Half of Ontario’s children in poverty live in the GTA (CAS 2008). Poverty is also experienced disproportionately by specific ethnic groups. The 2011 National Household Survey showed that in the City of Toronto, people of African, Caribbean, Middle Eastern, and Central Asian descent are considerably more likely to live in poverty than those descended from Europeans and East and Southeast Asians. To some degree this stems from how recently particular groups have immigrated as integration into social and economic life increases over time. Poverty negatively correlates with myriad social indicators. A recent report from Health Quality Ontario (2016) found that 28% of people in the poorest income quintile do not have access to enough food to meet basic dietary needs. Low-income people are also at higher risk of chronic health conditions and have shorter life expectancies.

The increasing prevalence of poverty has accompanied rising income and wealth inequality.<sup>7</sup> The Toronto census metropolitan area’s Gini Index—a common measure of inequality—for individuals and households has steadily increased since 1970, and by a larger amount than any other Canadian metropolitan area (United Way 2015: 39; Walks 2015: 152). Most of the increase is the result of rising incomes at the high end, with a

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<sup>7</sup> The existence of income and wealth inequality does not necessarily mean that those at the bottom are impoverished, nor does rising inequality necessarily correlate with rising poverty. Poverty and inequality are related, however, because government-led alleviation of poverty is funded through progressive taxation—the burden of which falls disproportionately on those with higher incomes.

corresponding shrinking in the proportion of households with middle-range incomes (Walks 2010: 135).

**Declining social mobility and rising precarious employment, especially for youth and immigrants.**

The engine of the formation of the Toronto region's postwar middle class was secure, often unionized, high-income manufacturing employment. Deindustrialization has transformed the nature of work in the region. The region's labour market is divided between two kinds of service-sector jobs: those that are low-paying, less-skilled, and insecure, and high-paying, high-skilled "creative-class" jobs that are well-remunerated and confer benefits. Shahil Thomas's assessment was direct: "There's no middle area anymore—the labour market is split."

Work has also become more precarious—temporary, without benefits, and with variable hours. On average, precarious workers earn considerably less than those with permanent jobs. Nationally, growth in part-time and low-wage employment has outstripped gains in full-time and high-paying jobs since the 1980s (Tal 2015). This is mirrored in the Toronto region. A recent study found that 18% of employed GTA residents have temporary or part-time jobs and more than half work at jobs that provide no security and benefits (PEPSO 2013, 2015). Older and less-educated workers are considerably more likely to be involuntarily unemployed, a gap that will increase with population ageing (TWIF 2015). Symptomatic of precarious employment is that the "working poor" constituted 9% of the working-age population in 2012—the highest rate among Canadian census metropolitan areas (Stapleton and Kay 2015).

Not all groups have experienced this transformation in the nature of work in the same way. The Martin Prosperity Institute reports that in the Toronto CMA, precarious routine-service-sector employment has increased dramatically since 2001, and is dominated by women, youth, the elderly, and new Canadians (MPI 2013). Disturbingly, a growing proportion of people with bachelor's and graduate degrees are employed in the bottom tier of the service sector.

Immigrants and visible minorities are disproportionately represented among the precariously employed. "It used to be that immigrants would come here and they would catch up," says Dennis Raphael. "Now we're finding that they're not. Statistics show that, for immigrants of colour, wages are lower even when you account for differences in language, training, and experience." Juan Gomez also noted that the opportunities available to new immigrants and the next generation are very different from the early postwar period because there is no longer such great need for unskilled labour. Although Canada gives preference to migrants with high educational attainment and skills, labour-market integration is inhibited by unrecognized credentials and a lack of "Canadian experience," that latter emanating from subtle or overt discrimination (Preston et al. 2011).

**A growing gap between rich and poor neighbourhoods.** Income inequality plays out geographically, separating “have” from “have-not” neighbourhoods. Echoing the work of University of Toronto academics David Hulchanski and Alan Walks, who have mapped a growing divide between rich and poor neighbourhoods in Canadian cities (Hulchanski 2010; Walks 2010), Shahil Thomas and Richard Matern noted that low-income residents are increasingly concentrated in areas with poor transportation options, inadequate access to healthy food options, and limited employment opportunities (Matern 2014; Stapleton, Murphy, and Xing 2012; Wray 2013). Many of rental apartment tower communities are located in postwar suburban areas that are relatively amenity-poor. The United Way (2011: 37) found that about 40% of high-rise apartment tenants were low-income in 2006. A growing number of low-income tenants are at risk of homelessness (Paradis, Wilson, and Logan 2014). Recent immigrant, racialized, and lone-parent families are disproportionately represented in the low-income and tenant populations. Dennis Raphael pointed to the many effects of poverty: “Look at the map of income. Then look at the map for diabetes, asthma, crime, sexual assault—they’re all the same map. Every health issue under the sun is correlated with income and precarious employment.”<sup>8</sup>

The interaction of growing poverty rates and declining housing affordability is creating a new social geography in the region. Several workshop participants expressed a concern that the Toronto region will become like New York City or London, UK, where only the wealthy can afford to live in amenity-rich areas. Richard Matern explained that rising rents and housing costs are displacing low-income residents on a larger scale than before. Tom Smith put it succinctly: “People can’t afford to live and work in the City of Toronto any more. Affordability is pushing them out and congestion is pushing them back. Everyone is reacting to those two things.”

While much of the research on socio-economic and neighbourhood polarization has focused on the City of Toronto, the same dynamics are at work elsewhere in the region. Jocelyn Strutt described the situation in Hamilton, where poverty is concentrated in the downtown core while wealthy neighbourhoods tend to be in the suburbs. There, the city is working to mitigate the negative impacts of increased interest in downtown development on the city’s most vulnerable citizens—development that is in part spurred by the arrival of people who have been priced out of the Toronto market. Isolation and concentration of disadvantaged people in tower areas is as much a concern in Hamilton and Mississauga as it is in the City of Toronto.

**Declining housing affordability.** Rising after-tax incomes, especially at the upper end of the income spectrum, as well as easy access to mortgage credit, have pulled housing prices upward, putting home ownership beyond the reach of many households. For most people,

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<sup>8</sup> See Mikkonen and Raphael (2010); see also van Ingen et al. (2015).

incomes have not increased at the same pace as rents and house prices, undermining housing affordability (Burda 2013; Burleton 2015; Smetanin, Moca, and Yusuf 2015).

Property ownership drives wealth inequality. As long-time homeowners ride property values up, the wealth gap between them and non-property-owners increases. Those in the middle who entered the market by taking advantage of low interest rates and relaxed down-payment requirements carry large debt loads and are vulnerable to interest rate hikes or changes in personal circumstances, such as job loss or illness. Nationally, the the number of highly leveraged mortgages that do not qualify for CMHC mortgage insurance may soon overtake the number of insured ones (Watt 2015). At the end of 2009, total household debt was 2.1 times disposable income in the Toronto region, of which mortgage debt accounted for 72% (Walks 2013: 166–67). The same analysis showed that debt ratios are highest in gentrifying central-city areas and outer-suburban areas that are home to concentrations of immigrants, and lowest in high-income neighbourhoods.

There is consensus that large-scale international, and especially Chinese, investment in urban real estate assets is responsible for some portion of the housing affordability crisis. This is the dark side of Canada's openness and stability. Toronto has become a magnet for investment by global high-net-worth individuals seeking a safe harbour for their capital. According to consultancy Knight Frank (2015), Toronto is regarded as a premier destination by the world's wealthy. The region's concentration of high-net-worth individuals exceeds Chicago and Los Angeles and is comparable to Shanghai, Paris, and Geneva. The National Bank of Canada estimates that \$20 billion flowed from China into Toronto and Vancouver real estate in 2015 alone (McKenna 2016). Higher sale prices at the top end reduce affordability in the rest of the market because those squeezed out at the top drive up prices in lower tiers of the market. As the threshold to enter the ownership market increases, would-be purchasers turn to the rental market. Increased demand for rental housing in the absence of expanded supply drives up rents, but tenant incomes are not increasing to match. Little purpose-built public and private rental housing has been created in recent decades and the stock of both is deteriorating.<sup>9</sup> Approximately 85,000 households (about 174,000 people) and growing were on the active affordable housing waiting list in the City of Toronto at the end of 2015 (Housing Connections 2015) and the average emergency shelter stay was over 60 days in 2011 (Polanyi et al. 2014: 16).

Workshop participants also acknowledged other drivers of rising costs for new housing. Lloyd Cherniak pointed to rising public expectations: "People want to see large-scale communities being built with all the bells and whistles from day one. The days when somebody started off on a small house and finished his own basement and suffered a little

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<sup>9</sup> Real estate brokerages have reported a sudden increase nationwide in purpose-built rental housing construction as pension funds, REITs, and other investors are attracted by cheap borrowing, high rents (and therefore predictable rates of return), and robust demand for less expensive housing as high house prices place home ownership out of reach of many potential buyers (CBRE 2015; McMahon 2015). With a little over 1,000 rental starts annually in the Toronto region, however the number of units produced is small relative to overall demand.

bit are long gone.” Will Dunning pointed out that the Toronto region’s long-term rapid growth trajectory limits affordability simply because much of our housing stock is too new: “The private market is actually very good at providing affordable ownership and rental housing, it just that takes them 60 to 80 years to build them.”

Cherniak, Dunning, and Frank Clayton also voiced the industry’s concern about overly lengthy approval processes and regulatory burdens that drive up costs and limit housing production. From this perspective, the regional housing market is subject to policy constraints that limit the creation of sufficient supply to meet demand for specific housing types and neighbourhood environments.

Housing unaffordability may drive some residents’ location choices. Between 2001 and 2006, over 250,000 people left the City of Toronto to settle in other municipalities in the GTA, Simcoe County, and Waterloo Region (Wilson 2009: 7–8), although more recent figures suggest that the outflow slowed in the second half of the last decade (City of Toronto 2014a). (The population of the City of Toronto, and of the region as a whole, have continued to grow because domestic out-migration has been offset by international immigration.) Households appear to be moving outwards in search of housing that is less expensive in both absolute terms and also in relation to property size.

**Escalating rents squeeze out community assets.** Separately, several participants raised concern about the lack of protection for other kinds of land uses. For example, participants in the society-themed workshop urged policymakers to think holistically about the physical requirements of community-based functions such as schools and non-profit social service organizations. Samir Sinha pointed to the transformation of Toronto’s core neighbourhoods, where gentrification and redevelopment have driven up the rents paid by non-profit agencies that rely on fixed grants to provide services to vulnerable groups. Higher costs force agencies to move to cheaper locations, which disrupts care networks and results in underserved populations. He cited the example of an organization that runs a dementia day program:

They have received funding from the Ministry to double the number of people they support in their community. The problem is that they are working above an old building with limited space. ... They can’t [expand their space] to serve more clients—they’re landlocked. So they embarked on what became a two-year journey to find more space in the same neighbourhood. They eventually had to move their day program much further west and north because of skyrocketing property prices.

While the organization’s capacity was expanded, it was now located beyond the reach of many of its clients. Dr. Sinha stated that his hospital emergency room has experienced a 37% rise in the number of visits by older patients in only five years, because they lack other options. This story reveals a gap in the process of creating and maintaining complete communities, especially in infill and redevelopment contexts.

**An inflexible built environment.** It is costly to change urban form and supporting infrastructure after it is constructed. While the Toronto region is growing rapidly, a large proportion of its urban footprint was developed in accordance with early-postwar planning ideas that emphasized the separation of non-residential from residential uses, and high-density from low-density housing. These ideas produced a built environment that is less resilient to social, economic, and environmental changes because it lacks diversity and redundancy. The result is a highly planned suburban landscape that performs poorly on a variety of social and environmental indicators: overreliance on the automobile to access employment, shopping, schools, and other amenities, and less efficient use of energy. This contrasts with less rigidly organized prewar urban landscapes, whose mixed-use form, fine-grained parcel structures and street systems, and more flexible zoning enable variable adaptations. Since the 1990s, aspects of new suburban neighbourhoods have been planned in ways that mimic some prewar characteristics, however analysis suggests that their performance is similar to that of earlier postwar neighbourhoods (Hess and Sorensen 2015; Taylor and Van Nostrand 2008). More recently constructed neighbourhoods are less mixed-use, more uniform in their range of house types, and less dense than those constructed in the 1960s. They are also designed with street systems that are less connected and less grid-like, which inhibits efficient travel by foot, cycling, and transit.

It is too early to tell if the “complete communities” policies adopted by the province and municipalities over the past decade for new urban developments on rural land will produce built environments that perform as well as prewar neighbourhoods (see box “Complete communities”). Hess and Sorensen (2015: 148) conclude that

more ambitious approaches will be necessary to create the ‘complete communities’ .... It seems clear that to achieve this will require strategies to influence both employment and retail location, issues that were hardly mentioned in [the Growth Plan for the Greater Golden Horseshoe]. Changing the pattern of development will also require a reconsideration of the role of the arterial roads grid and the super-blocks that it creates, which have continued to be the fundamental planning and urban form frameworks for new growth in the region.

### **Complete communities**

The 2006 Growth Plan for the Greater Golden Horseshoe defines “complete communities” as follows:

“Complete communities meet people's needs for daily living throughout an entire lifetime by providing convenient access to an appropriate mix of jobs, local services, a full range of housing, and community infrastructure including affordable housing, schools, recreation and open space for their residents. Convenient access to public transportation and options for safe, non-motorized travel is also provided.” (s. 7, Definitions)

It is also unclear whether the intensification of established residential areas will produce more complete communities. While large-scale master-planned zones such as the West Don Lands may achieve this ideal by virtue of public land ownership, selective recruitment of anchor businesses and services, and the advanced provision of transit services, parcel-by-parcel intensification projects may not contribute to fulfilling regional policy objectives, such as the more efficient use of existing infrastructure and services. For example, a recent Neptis Foundation analysis found that only 20% of new dwelling units and 13% of new residents in the Greater Toronto and Hamilton Area between 2001 and 2011 were located near subway stations or designated Metrolinx hubs (Burchfield and Kramer 2015: 59; Taylor, Burchfield, and Kramer 2014: 31).

While sometimes catalyzed by public action, existing urban areas are transformed mostly through private investment. Aderonke Akande suggested that there is a risk of selective attention in infill and redevelopment processes. As the public and private resources available to “reprogram” poorly performing neighbourhood environments are limited, they cannot flow everywhere: “How do you enable transformative change in the areas of the city that are not of interest to private-sector investors? ... This is where a lot of the towers are located. Those areas were designed in an era when the zoning was almost exclusively residential. Now you have a population that is living there that does not own a car. The needs are different.” The City of Toronto is working to diversify ageing rental residential tower areas by creating incentives to retrofit buildings to increase their energy efficiency and extend their operational life while improving safety and access to food and recreational amenities. Toronto’s adoption of a new Residential Apartment Commercial zoning category in 2014 may extend the scope of tower renewal by permitting new commercial, recreational, and community uses in tower neighbourhoods originally designed to be exclusively residential spaces. The promotion of mixed-use development in these areas represents the diversification of the apartment neighbourhood “portfolio,” one that may increase the resilience of their built form over time.

Contemporary planning orthodoxy aspires to a greater mix of uses, yet existing land-use patterns and zoning practices lock in a use-segregated built environment. At least half of all jobs are located on lands zoned exclusively for employment uses—that is, for commercial, industrial, and logistics activities (Hemson Consulting 2005: 44). Exclusive employment zoning was and is intended to protect residential areas from incompatible and noxious uses, yet its effect is to reinforce automobile commuting. Similarly, the consolidation of retail establishments into highway- or arterial-oriented “power centres” separated from the residential urban fabric undermines access by walking, cycling, or transit (Buliung and Hernandez 2013). Exclusive employment and retail zoning and the preservation of underutilized lands may inhibit future adaptation to economic and technological change. Matthias Sweet urged a regional policy focus on “special places”—those “where intensification can deliver more value for the developer and create potential for more and better jobs.”

## Exploring interconnected risks and policy conflicts

The workshop participants agreed that while the Toronto region possesses many assets, it also has vulnerabilities that may undermine its social, economic, and environmental resilience to external risks that are mostly, if not entirely, beyond the control of provincial and local government, including macroeconomic conditions, climate change, and macro-demographic shifts (see **Table 3**). The governance challenge is to anticipate and mitigate risks by reducing or eliminating vulnerabilities. The regional economy, society, natural and built environments, and fiscal-governmental system can be viewed as portfolios of assets whose emergent vulnerabilities may be interpreted as an erosion of diversity and redundancy.

The workshop discussions revealed the complex interconnectedness of domains that are often considered separately. Focusing attention on these sites of intersection will provide the greatest returns on investment because interventions will provide mutually reinforcing benefits across domains. As foreshadowed in **Part 1**, the built environment—over which local governments have considerable influence—emerges as the pivotal site at which risks and vulnerabilities intersect, and where the greatest returns may be achieved.

We conclude this diagnostic scan with an exploratory discussion of several potential points of intersection, as well as points at which policy objectives may come into conflict. The discussion is not exhaustive, but it raises the kinds of questions that might inform anticipatory governance processes.

**Is reliance on international migration a source of risk?** The region's population growth depends almost entirely on international migration. Without it, the population of the Toronto region's core, suburbs, and the region as a whole, would decrease in absolute terms. International migration also slows population ageing relative to other parts of Canada. Toronto's ability to attract migrants depends on its ability to deliver quality of life and absorb them into the labour market. Both are under threat due to suboptimal built-environment and infrastructural variables (unaffordable housing and long commutes) and socio-economic variables (elevated poverty rates and barriers to stable and well-remunerated work). The Toronto region risks economic decline and increased poverty and inequality if its value proposition to migrants diminishes relative to other places. On the other hand, some participants argued that Toronto's attractiveness is assured by the presence of established emigre communities and its relative stability and performance compared to other parts of the world. Banking on this may be another emanation of complacency, however, exposing the region to risk. What is clear is that the region's economic and social health are closely hitched to continued immigration and successful settlement.

**Table 3: Summary of the Toronto region’s assets, vulnerabilities, and risks**

<b>Domain</b>				
	<b>Economic</b>	<b>Natural and built environment</b>	<b>Social</b>	<b>Fiscal-governmental</b>
<b>External risks</b>	Technological innovation Business cycle Exchange rate Interest rates Foreign direct investment decisions Factor costs (energy)	Climate change (impact on water systems, extreme weather events, temperature)	Migration (international, domestic, intra-metropolitan) Population ageing	Unpredictable federal and provincial fiscal and policy support
<b>Internal vulnerabilities</b>	Infrastructure deficit Weak innovation system Low productivity	Inflexible built environment Vulnerable infrastructure (energy, stormwater management)	Rising inequality, poverty Neighbourhood polarization Declining social mobility Declining housing affordability Ageing affordable housing stock Displacement of community organizations	Complacency Barriers to inter-municipal collective action Tax base erosion Public and political resistance to taxation
<b>Assets</b>	Agglomeration Growth Economic diversity Proximity to markets	Inland location Access to fresh water Arable land	Tolerance Social diversity High educational attainment	Political stability Honest government Relative fiscal prudence

**How might population ageing and inequality undermine fiscal capacity to mitigate future risks?** The external risks discussed will interact in ways that may have profound impacts on tax effort and incidence, with implications for the timing of investment. Much of the money that will be spent maintaining, replacing, and building new infrastructure will be borrowed, and over long terms. This is sensible as interest rates are at historic lows and borrowing enables costs to spread over the lifetime of the asset it funds. The money to repay the principal and interest to lenders will come from future revenues.

As labour force participation declines due to population ageing and automation, federal and provincial governments may experience erosion of personal income tax revenues. This will occur even as demand for health care increases. Forecasts suggest that personal retirement savings and public and private pensions will be insufficient to maintain quality of life as longevity increases. Elder poverty may increase in the absence of expanded public income supports, which must be funded through payroll contributions or general taxation. Increasing the eligibility age for benefits would recognize the capacity of healthy older people to work longer and reduce fiscal stress by turning recipients into contributors. (In this context, the Ontario government's move to introduce an expanded contributory pension scheme is sensible, while the federal government's reduction of the Old Age Security eligibility age is not.) Municipal property tax revenues may also decline because seniors' propensity to move and purchasing power declines as they age, driving down property values (Takáts 2010). Rising income and wealth inequality may also erode support for general progressive taxation and income redistribution. Some political sociologists have argued that support for income redistribution will decline if politics becomes framed as a zero-sum battle between "makers" and "takers" (Banting and Myles 2013; Green, Riddell, and St-Hilaire 2016).

In this context, governments at all levels may come to rely increasingly on user fees and consumption taxes, the regressive nature of which will disproportionately burden the less well-off, exacerbating poverty and inequality. This raises the question of whether governments should raise more revenues now to finance present and future investments because the money may not be available later.

**How can built environments be made more resilient?** The creation of so-called "complete communities" is an important goal of provincial land-use policies. The Growth Plan calls for neighbourhoods to be "well-designed, offer transportation choices, accommodate people at all stages of life and have the right mix of housing, a good range of jobs, and easy access to stores and services to meet daily needs" and for "community infrastructure" to be planned in concert with land use. There is a risk, however, that framing the "completeness" of neighbourhoods as a fixed, near-term end-state will inhibit adaptation to changing circumstances. Resilient neighbourhoods must be planned not only for the needs of residents of today, but also for the needs of those who may live there in 20, 50, and 100 years. Planning with the area's future residents in mind may reduce the problems associated

with inflexible built environments highlighted by Aderonke Akande (tower neighbourhoods) and Samir Sinha (senior-unfriendly residential environments). The future, however, is uncertain. The challenge is to imagine urban built environments that can adapt to perform well under a variety of possible futures. As discussed in **Part 1**, one approach is to think of neighbourhoods as *portfolios of assets*, the composition of which may evolve as conditions change without compromising the quality of life of residents or their contribution to the region's economic productivity.

Adaptation may be enabled in several ways. First, buildings and neighbourhoods can be constructed to accommodate a broad range of occupancy and use patterns. Dennis Raphael and Samir Sinha pointed to the importance of creating buildings and neighbourhoods whose physical program is flexible and multifunctional. Raphael pointed to the St. Lawrence neighbourhood as Toronto's best example of a district that combines diverse uses, often within a single building: schools, ownership and rental housing, small businesses, and community facilities such as libraries and social service agencies. Viewing neighbourhood-scale built environments as portfolios is a way of understanding why some neighbourhoods maintain their stability while others decline. Fine-grained and diversified urban form may enable more successful adaptation to changing circumstances over time, including the needs of an ageing population, than single-use and undifferentiated built environments. This prescription has affinities with Jane Jacobs's argument in *The Death and Life of Great American Cities* (1961) that successful cities evolve in a condition of "organized complexity."

Renée Gomes explained that Waterfront Toronto is encouraging flexibility by requiring minimum ground floor heights in condo buildings to permit future commercial uses and LEED Gold compliance to reduce future maintenance costs. Similarly, Diego Morettin described his experience with hospital design:

You try to keep in mind that you're in a 40-year cycle, changes in practice, in disease, in things you don't know might happen, and you want to make sure that your infrastructure can handle those changes. We've seen a huge shift in policy regarding the resilience of buildings. As an example, we used to design a building that would have emergency power for critical systems only, such as people on life support, whereas now we see building infrastructure designed with redundancy to support operations and services during a wider range of adverse events.

The discussion revealed a tension between understanding flexibility as deregulation and the use of regulation to promote flexibility. Tom Smith remarked, "You can't be too prescriptive. You have to harness the momentum and layer things on top of that." Dennis Raphael offered a caution, however. Relaying a story of a developer refusing an offer of extra density to build affordable units, he said that sometimes incentives do not work even if they are generous because developers do not want the responsibility: "Sometimes you have to regulate."

This leads to a second point: the need for flexible community facilities that can evolve as neighbourhood population profiles and conditions change. These facilities may be thought of as portfolio of productive assets with variable and evolving components. School enrolments and demand for children’s daycare and elderly long-term care services fluctuate on a generational time horizon. Viewing each function in isolation is short sighted. Instead they should be understood as a portfolio of community assets whose composition changes over time. If the physical space that houses these functions was protected, it could be adapted to meet changing needs. Workshop participants presented an image of a flexible space—perhaps several floors of a mixed-use building—that could be transformed from a school and daycare to a provider of adult and senior day programs and back again over the lifetime of the building. Samir Sinha and Richard Matern suggested that the physical space occupied by social services agencies should be protected or subsidized to avoid displacement when their rents increase. “Remove that obstacle,” Sinha said, “make sure that the land cost is not the barrier for service providers.” The province is taking preliminary steps in this direction as it develops a “community hubs” strategy for the more flexible use of existing public facilities such as schools and community centres, including the colocation and integration of non-profit social service organizations (Pitre 2015).

### **Resilient urban form**

The notion of designing “complete communities” to perform well under a range of potential future conditions is consonant with the findings of a recent project by the London School of Economics on the resilience of urban form (Smith 2013). They conceptualized “resilience” as “the conditions of both urban form and its management over time that enable localities to persist in attracting and generating use and value and/or to adapt in order to remain viable and productive” (7). The research team looked at the historical development and evolution of eight urban districts of various ages, including London’s Mayfair and Belgravia; New York’s Hudson Square; Reston, Virginia; Irvine, California; Op ra in Paris; and Singapore’s Chinatown. They conclude that resilient urban form:

- sustains sufficient density to make adequate use of infrastructure and support a diversity of uses while not inhibiting the economic, social, and cultural potentialities of the public realm;
- integrates different transport options with diverse street-based activities;
- permits change in use over time in ways that facilitate and enhance economically sustainable use;
- incorporates publicly accessible and biodiverse green and open space;
- accommodates diverse tenure types to share resources and amenities across socio-economic groups; and
- has stable property values over time.

They conclude that the planning and design of resilient urban districts requires long-term anticipation of possible change at the urban scale, as well as careful stewardship of private property and the public realm to enable positive evolution.

Third, the portfolio metaphor can also be applied to urban open spaces. Workshop participants Brenda Webster and Yvonne Yeung described a growing “green infrastructure” movement in landscape architecture and environmental design to introduce diversity into specific features and projects by making them multifunctional (Ahern 2011; Arup 2014a; Brown et al. 2015). For example, public green space may be designed to function as a recreational amenity for a variety of age groups, a storm water management system, a flood and urban heat island mitigation device, a multi-modal mobility corridor, a species habitat, a carbon sink, and a catalyst for neighbourhood-scale investment. Viewed this way, a humble neighbourhood park can be understood as a portfolio that delivers immediate social, public health, economic, and environmental benefits while mitigating future risks. Processes for siting, sizing, and designing urban open spaces should consider all of the services they provide.

**Is it possible to create appropriate financial incentives to create desirable development patterns without imposing undue burdens on those least able to pay?** The recurring themes of how to finance infrastructure expansion and replacement in ways that promote desirable urban development patterns and positive social outcomes are closely intertwined. Cherise Burda and Craig Applegath argued for the renovation of the existing public finance system. They argued that some forms of hard infrastructure, such as sewer, water, and road systems, have been shown to operate at a loss in low-density suburbs, meaning that high-density areas subsidize low-density areas. Applegath called for the replacement of municipality-wide average-cost pricing of services with location-specific true-cost pricing: “Stop subsidizing suburbs. It costs the taxpayer more overall. If we make the suburbs unaffordable, people will get over their fear of density.” Burda applied this to transportation, noting that “we’re used to driving for free”—when in fact the costs of roads and associated infrastructure are funded out of general revenues. Hilary Holden, in a discussion about the economic cost of delays to goods movement on congested roads, offered what she called a “simple solution: you have to price people out to make that congestion go away so you can get the freight traffic moving. You need to get more people paying the externalities of their driving trips.” Echoing longstanding economic thought, Frank Clayton argued that user-pay is the best approach: “As much as possible all infrastructure should be financed through user charges. If you can find the beneficiaries, they should be paying for it.”

An unresolved difficulty with removing perverse incentives and embracing user-pay is that its impact is likely regressive. The impacts of true-cost pricing and user-pay will be felt most intensely by residents who lack the current income and accumulated savings to alter their housing and travel choices. Matti Siemiatycki noted that increasing or diversifying the application of user fees cannot come at the expense of social equity: “You need to make sure that those at lower end of the income spectrum are not adversely impacted” through progressive income redistribution and means-tested rebates.

Beyond this, it is unclear what will happen to inefficient urban form when it is made more expensive. Will its value decline as people move to more efficient locations? Will it become a preserve for those who can afford to pay for inefficiency, thereby rising in value? Or will it attract transformative public and private investment that reduces its operating costs? As discussed, existing built environments are difficult and costly to change. Poorly performing urban environments do not simply disappear.

Separately, some workshop participants advocated for capturing increases in land value induced by redevelopment and infrastructure expansion to pay for up-front capital expenditures. Frank Clayton argued that Ontario's current value property assessment system already does this well: "Use the current market value assessment. Anything that improves the value of land or buildings, be it transit going in, or roads going in—current value assessment accounts for it." Tom Smith argued for a simple extraction of value at the time of re-zoning: "For intensifying along transit corridors, you do it at the time of re-zoning. Move the zoning from x to y and take some percentage of that value increase as a payment." Discussing Markham's strategy, Yvonne Yeung emphasized how getting the design fundamentals right—energy efficiency, tree plantings, a strong public realm, and the early delivery of community facilities—attracts high-value development. Similarly, Brenda Webster discussed how Waterfront Toronto's early design and installation of parks and other community assets, before even the buildings were begun, generated public interest and solidified the value proposition for private developers. The fundamental incentive, then, is to encourage high-value development in order to maximize land-value uplift. Indeed, the Urban Land Institute makes the case for resilience on the basis of the financial returns it produces (McCormick and Marshall 2015).

The difficulty of a financing strategy based on land-value capture is that it may exacerbate housing unaffordability and further displace nongovernmental community service agencies. One solution is to use regulation to require developers to incorporate less expensive units in their projects. (Indeed, the province's proposed *Promoting Affordable Housing Act* would strengthen municipal powers to do so.) Yet regulation in the absence of public subsidy either drives up the cost of the other units or produces very small units that accommodate only certain types of households. Another solution is to expand public ownership of housing and buildings containing private and non-profit community facilities. This is unlikely to occur without raising taxes.

This is related to a second difficulty—the potential unrecoverability of capital costs and the potential need for permanent operating subsidy. In essence, growth may not be able to pay for growth. Matthias Sweet noted that transit is a difficult nut to crack because all rides are subsidized: "There are no really good rates of return for the private sector in financing the capital side of transit. You need to look at the value creation beyond fares." The same is true of social housing—its purpose is to be run at a loss, for if its residents could pay its true cost a subsidy would not be required. A more profound uncertainty-driven risk is that many infrastructure improvements and redevelopment projects may

never repay their cost. As many American jurisdictions that experimented with tax-increment financing have discovered, increased property tax revenue due to land-value uplift often falls short of expectations. Some of the most expensive infrastructure and facility projects involve replacement rather than expansion. These interventions are unlikely to generate increased land values and so must be funded from general rather than incremental revenues.

### 3. The political challenge: selling resilience

Workshop participants acknowledged that proactive resilience-oriented policymaking and planning will be a hard political sell. The range and scale of upfront investment in hard infrastructure and soft services envisioned would require significant modification to the current system of taxation and expenditure, and would run up against public skepticism regarding the efficacy and efficiency of government. This paper concludes with a reflection on the potential foundations of a new public narrative to support investment in the service of a more resilient economy, society, and environment.

**Focus on quality of life, not crisis response.** All too often spending is presented to the public as an urgent response to crisis or in terms of individual economic self-interest. The experience of other jurisdictions suggests that basing public appeals on collective quality of life may be more effective at mobilizing support for expenditure.

Workshop participants debated whether a crisis narrative is needed to spur action on social, economic, and fiscal problems and risks. Some argued, for example, that a crisis narrative is necessary to mobilize public support for extreme weather event readiness. The problem is that not all issues are reducible to crisis, and the impacts of crises are not evenly distributed across society. People who are most at risk—such as the poor, the elderly, recent immigrants—may have the least voice. Crisis narratives may also favour a reactive rather than proactive posture. Acting only in times of crisis, such as economic recession, disease outbreak, or infrastructure failure, may lead to spending that is non-strategic, is sporadic rather than consistent, and does not increase positive spin-off effects. The Toronto region has also seen appeals to individual utilitarian self-interest—for example, CivicAction’s “what would you do with 32?” campaign. Again, the impacts of diffuse problems such as high congestion-induced commute times fall unevenly across society. Those with the greatest resources and voice may have the least to gain.

An alternative approach is to make a broad appeal to enhanced quality of life. The advantage of a quality-of-life framing is its potential to bridge social, economic, and environmental domains and highlight the interconnectedness of risks and vulnerabilities. Andrew Pietriwicz identified quality of life with the reliability of infrastructure and services, suggesting that this may be a fruitful way of building support for redundant

systems. Matthias Sweet framed the economic costs of Toronto's current transportation congestion problems in quality-of-life terms: "If you live in Mississauga and you work in Toronto and there's no transit, you're just going to sit in traffic and you're going to hate your life. In order to compensate somebody for hating life you're going to have to increase their wages over the long-term. So quality of life issues are economic issues because it has to do with the price of labour."

Vancouver's experience is instructive. In the early 1970s, regional planning was on shaky footing. The old technical methods of land-use and infrastructure planning, which narrowly focused on efficiency criteria, had lost legitimacy. Much as in the former City of Toronto in the same period, reform candidates captured city council on a program of improving quality of life by stopping highway construction and slum clearance projects. Reflecting this ethos at the regional scale, the Greater Vancouver Regional District (GVRD) embarked on an unprecedented "Urban Futures" survey that reached thousands of residents. The result was a reframing of social, economic, and environmental issues in relation to a "livability" narrative that laid the foundation for positive actions rather than stopping negative ones. Broad-based public engagement was repeated when successor regional plans were developed in the late 1980s–early 1990s and late-2000s. The adoption of mass outreach and inclusive processes have been credited with generating broad public support for the GVRD's planning policies, while also bringing organized interests on-side (see Cameron and Simon 2014; Harcourt, Cameron, and Rossiter 2007). Similar mass engagement exercises have occurred in some American regions, including Portland, Oregon, and Salt Lake City, Utah (Fregonese and Gabbe 2011; Hopkins and Zapata 2007).

These exercises have several characteristics in common. First, the objective of Vancouver's regional planning processes was to maintain and increase quality of life. Second, each used contrasting long-term scenarios to frame collective discussion and mobilize support for action. Scenarios incorporated variables across domains, highlighting the intersection of economic, social, and environmental risks and vulnerabilities. Such an approach is compatible with the exploratory scenario planning technique described in **Part 1**. Evidence-based scenarios can be used not only to identify negative impacts and positive returns in order to target investments, but also to increase stakeholder and public knowledge and mobilize public support around solutions.

Despite having developed an elaborate system of institutionalized consultation with the public and organized stakeholders in relation to discrete plans, policies, and projects, Ontario has not engaged in direct civic engagement at the regional scale.

**Making the case for investment.** In exploring the unwillingness of governments to borrow or increase taxes, Matti Siemiatycki suggested that a generalized lack of understanding of fiscal concepts exacerbates public finance constraints. One way out is for leaders to make a firm distinction between *investment* and *spending*. Good investments create assets that generate returns and value. "Spending," by contrast, is ephemeral. Siemiatycki also argued that the

public must also understand the distinction between *funding* by governments and *financing* by lenders. Borrowing to amortize upfront costs creates an incentive to ensure that investments are productive. These distinctions can be clarified to the public by making a distinction between capital and operating expenditure. Municipalities already do this, although this is not widely understood by the public. (Municipal operating budgets must be balanced every year; the capital budget may be funded by debt.) The federal and provincial governments, however, combine the two. It would be easier to make the distinction between ephemeral spending and the creation of durable assets if they are separately accounted for. While this concept has been criticized in some quarters (see Dachis and Robson 2014), keeping two sets of books could make it easier for the province to make the case for investing in productive infrastructure assets without being undermined by accusations of wasteful spending.

Workshop participants also emphasized the importance of transparent analysis of proposed investments. Siemiatycki stressed the importance of being able to assess and prioritize infrastructure projects according to the benefits they will deliver. Distinguishing between investment and spending on the level of rhetoric accomplishes nothing: “investing in unproductive infrastructure projects is still wasteful spending. You need to put money into the right projects.” In other countries including New Zealand and the United Kingdom, infrastructure proposals are evaluated and funding is allocated on the basis of their business case—an assessment of how the economic and social benefits and incremental revenues balance against the costs over the lifetime of the project. This informs the question of whether public and private investments can be paid back through incremental revenues within a reasonable amount of time (i.e., the amortization period of debt incurred or a P3 concession). As in the United Kingdom, business cases can also be used as a means of prioritizing investments within a competitive funding environment.

A transparent business case approach for infrastructure or urban development projects may reveal the inefficiency of current practices and create incentives to think in terms of productive investment rather than spending. Frank Clayton decried the narrow way in which City of Toronto staff reports communicate the fiscal impact of decisions. A report on a major development application may state “no fiscal impact,” even though it may induce substantial property tax revenues. A recent controversial study by City of Calgary staff concluded that new suburban divisions would not “turn a profit”—that is, generate sufficient incremental property tax revenue to offset up-front public infrastructure expenditures—for eleven years (Markusoff 2014). Without context the public cannot assess whether this is a reasonable time lag or a symptom of inefficient development patterns.

A potential downside of the business case approach is that governments seeking to delay investment may use requests for refinements to the evidence base as a stalling mechanism. Hilary Holden recounted that there is a transparency gap in the UK because business cases prepared by proponents for central government funding are not necessarily made public. Business cases are prepared by civil servants to inform decision makers but

ultimately investment decisions are political. A further dilemma is how to incorporate non-fiscal benefits into the business case. As Matthias Sweet put it, prioritizing the fiscal return on investment leads to different decisions than if the goal is to improve mobility as a social good. The general message, however, was clear: the public decision to invest must in some way be tied to the fiscal, social, economic, and environmental performance—which may be construed as resilience—of the proposed asset. Transparent disclosure of potential returns will not only facilitate prioritization of interventions; it will also help communicate their importance to a skeptical public.

## Conclusion

This paper applies a resilience lens to evaluate the Toronto region's assets and vulnerabilities, and draws lessons of use to municipal and provincial policymakers as they review and amend the provincial and municipal framework for land-use planning and infrastructure investment. It also endeavours to connect land-use and infrastructure questions to other policy domains in relation to recognized risks and sources of uncertainty. To do so, we synthesized insights on the Toronto region from a diverse range of professionals and published literature, and also from academic and other published works on resilience. The objective was neither to engage in speculative futurism nor to argue, like Chicken Little, that the sky is falling. Rather, the result of this project is a sometimes provocative reflection on the region's assets, vulnerabilities, and challenges; an investigation into potential gaps in policy content and process; and a window on alternative ways of viewing generally accepted problems.

The workshop participants agreed that decisions made today have potentially long-term effects, and so we must accept uncertainty, manage risks, and be prepared to adapt. Juan Gomez remarked that “we really do need to get our fundamentals right because we can't predict.” To reiterate Toby Lennox's remark cited earlier, “We didn't know what would happen in 50 or 100 years. The one thing we did know is that if we didn't get the first 20 years right, the next 20 years wouldn't really matter.” In this vein, Andrew Pietrewicz invoked U.S. President Dwight D. Eisenhower, who once said “plans are worthless; planning is everything.” Pietrewicz summed up the challenge of anticipatory governance: “we will never know what the future needs are, so it's a matter of maintaining options. The planning has to be routinely revisited so that we're better able to change along the way.”

Incorporating the potential for adaptation to social, economic, and environmental change into planning processes is a precondition of resilience. This is true at the scale of the building, the parcel, the neighbourhood, the municipality, and the region. Redundancy and diversity enable adaptation. Faisal Moola used the example of a keystone species,

without which an ecosystem collapses. Having other options, or redundant capacities, enables the system to continue to function under stress.

Finally, much discussion concerned the current political impasse regarding how best to finance and expand overdue hard and soft infrastructure of all kinds. The discussion pointed toward the need for a new public narrative, one that portrays wise capital spending as an investment, and links it to quality of life improvements. Much depends on leaders' ability to communicate the need for social and economic investment. As George McCarthy, the president of the Lincoln Institute of Land Policy, recently remarked: "We have to ... rebuild the understanding in the general population of the role of local government and why it is necessary and good to pay taxes, or otherwise the provision of public goods would not happen" (Kredell 2015). Without renewed investment, the Toronto region's vulnerabilities may eclipse its considerable assets, undermining its resilience to economic, social, and environmental risks.

### **Note to the reader**

After this paper was completed the provincial government released proposed revisions to the Growth Plan for the Greater Golden Horseshoe, the Greenbelt Plan, the Oak Ridges Moraine Conservation Plan, and the Niagara Escarpment Plan. These proposed documents, which are available from the government's Places to Grow website, contain a number of changes that align with some of the ideas presented in this paper. These include:

- When planning new or expanded infrastructure systems, municipalities would be required to undertake long-term scenario-based evaluation of the financial viability of assets over their complete life cycle. Also, settlement area expansions would only be permitted if supported by a viable financing plan for infrastructure and public service facilities (including education, social services, health care, and protective services that receive government funding).
- Master planning for water and wastewater infrastructure would take into account climate change impacts, including forecast changes to precipitation volume and intensity.
- Municipalities would be required to undertake, with public and private partners, integrated planning for public service facilities, including the co-location of schools with other community functions in "hubs." In the proposed plans, public service facilities are discussed as integral to complete communities.
- Municipalities would be expected to plan to achieve greenhouse gas emission reductions and mitigate climate change impacts in part through urban and rural land-use and infrastructure planning.

These and other changes, and the degree to which the revisions integrate policy objectives across domains, are encouraging developments. Still, much hinges on implementation. The proposed plans place new substantive requirements and procedural burdens on municipalities. As the plans' objectives cannot be realized without the support of local government leaders, private-sector stakeholders, and the public, the provincial government must take care to explain the long-term benefits of its policies and cultivate broad support.

## Appendix: Workshop process and participants

Four workshops were held between February 17 and 20, 2015, with between five and eight participants in each. Participants were recruited on the basis of their expertise so that each group represented a broad range of professions and knowledge bases. We specifically sought “doers”—experienced people directly engaged in professional practice rather than the leaders of organizations. We also sought geographic representation from different parts of the Toronto region. Each workshop was three hours long. The project leaders facilitated the discussion by posing questions, but allowed it to unfold organically. The discussions were recorded and transcribed by research assistants affiliated with the University of Toronto’s Program in Planning. With the assistance of project partner the Urban Land Institute, the workshops were hosted by the national interdisciplinary planning and design consultancy DIALOG. ULI–Toronto’s Executive Director and DIALOG staff with relevant expertise were invited to participate in the discussions. Participants’ affiliations are listed as they were at the time of the workshops and, if changed, as they were at the time of publication. Previous affiliations are also indicated where relevant.

### **Fiscal Resilience Workshop – Tuesday, February 17, 2015**

Lloyd Cherniak, Vice President, Lebovic Enterprises

Frank Clayton, Senior Research Fellow, Centre for Urban Research and Land Development, Ryerson University

Hilary Holden, then Head of Transportation Consulting in Canada, Arup; now Director, Transit and Sustainable Transportation, City of Toronto

Richard Joy, Executive Director, ULI Toronto

Matti Siemiatycki, Associate Professor, University of Toronto Program in Planning

Robert Hatton, Director, Strategic Initiatives & Intergovernmental Finance, City of Toronto was unable to attend the workshop and was interviewed separately

### **Environmental Resilience Workshop – Wednesday, February 18, 2015**

Aderonke Akande, Project Manager, Tower and Neighbourhood Revitalization, City of Toronto

Craig Applegath, Principal, DIALOG

Cherise Burda, then Regional Director, Ontario, Pembina Institute; now Director, City Building Institute, Ryerson University

Richard Joy, Executive Director, ULI Toronto

Faisal Moola, Director General, Ontario and Northern Canada, David Suzuki Foundation

Andrew Pietrewicz, Director, Resource Integration, Power System Planning at Independent Electricity System Operator (IESO)

Brenda Webster, Architecture and Urban Design Consultant

Yvonne Yeung, Senior Planner, Urban Design, City of Markham

**Economic Resilience Workshop – Thursday, February 19, 2015**

Damian Dupuy, Manager, Strategic Policy Coordination, Ministry of Economic Development, Employment, and Infrastructure, Government of Ontario

Juan Gomez, then Vice-President, Government Relations and Policy (Acting), Toronto Region Board of Trade; now Senior Partner, Policy and Public Affairs, ThinkTank Toronto

Toby Lennox, consultant; formerly Vice President of Strategy Development and Stakeholder Relations at the Greater Toronto Airports Authority

Tom Smith CRX MCIP RPP, Senior Vice President, Development and Leasing, SmartCentres Inc.

Martin Sparrow, Principal, DIALOG

Matthias Sweet, then Postdoctoral Fellow, McMaster Institute for Transportation and Logistics, now Assistant Professor, School of Urban and Regional Planning, Ryerson University

Peter Thoma, Partner, urbanMetrics

**Social Resilience Workshop – Friday, February 20, 2015**

Will Dunning, President, Will Dunning Inc., Economic Research

Renée Gomes, Director, Development, Waterfront Toronto

Richard Matern, Senior Manager of Research, Daily Bread Food Bank

Diego Morettin, Principal, DIALOG

Dennis Raphael, Professor of Health Policy and Management, York University

Samir Sinha, Director of Geriatrics, Mount Sinai and the University Health Network Hospitals and Provincial Lead, Ontario's Seniors Strategy

Jocelyn Strutt, Project Manager, Neighbourhood Action Strategy, City of Hamilton

Shahil Thomas, then Local Economies Developer, Metcalf Foundation; now Manager, Toronto Enterprise Fund, United Way of Greater Toronto

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