Economic Vision and Strategy Report for the Toronto Region

Created with the research support of
INSTITUTE FOR COMPETITIVENESS & PROSPERITY
Founded in 1845, the Toronto Region Board of Trade is the chamber of commerce for Canada’s largest urban centre, connecting more than 12,000 Members and 250,000 business professionals and influencers throughout the Toronto region.

The Board fuels the economic, social and cultural vitality of the entire Toronto region by fostering powerful collaborations among business, government, thought leaders, and community builders. Toronto Region Board of Trade plays a vital role in elevating the quality of life and global competitiveness of Canada’s largest urban centre.

Membership with the Board offers the opportunity to be part of a network of our region’s most influential business leaders, who are working together to help shape the future of the Toronto region.
TOWARD A TORONTO REGION ECONOMIC STRATEGY

Economic Vision and Strategy Report for the Toronto Region

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It is with a great sense of excitement and anticipation that we release our report, *Toward a Toronto Region Economic Strategy*. The report is the product of a unique collaboration between the Toronto Region Board of Trade and the Institute for Competitiveness & Prosperity, sponsored by KPMG.

Drawing on the knowledge and expertise of our respective organizations, the report challenges us to think about what an economic game plan for the Toronto region would look like. Make no mistake, the stakes are high for the Toronto region. As the global economy emerges from the worst economic downturn since the Great Depression, some trends are starkly evident. More than ever, large urban regions are the world’s magnets for people, firms, and investment. They are the key drivers of prosperity. City regions with populations of over one million people produce more than half of the world’s economic output and a startling nine out of every ten innovations. It is notable that the Toronto region’s contribution to our national economy, roughly 20 per cent of GDP, matches that of Greater London, in the United Kingdom.

It is no exaggeration to say that strong national and provincial economies depend on having a Toronto region that is firing on all cylinders. How we position ourselves in this environment will ultimately tell the tale of whether we play in the big or minor league of the global economy.

Many of the building blocks of success are there: strong human capital, large and diverse business clusters, and world-class post-secondary institutions. Nonetheless, our challenges – frayed transportation infrastructure, lagging innovation and productivity and muddled regional governance – keep us from fulfilling our enormous promise. Tackling these kinds of big structural issues will not be easy. Indeed, a proactive course of action means making some tough choices and accepting a measure of risk. Yet we know standing still is not an option, especially when we see our global competitors from Boston to London making bold strategic bets on their future.

This is the third report in the Board’s 2014 election campaign. The first report, *Think Twice, Vote Once – Decision 2014*, raised the call to mayoral candidates and provincial parties that we must shift from frustration to aspiration. We expect action on the priorities that matter to our region’s future. The Board’s second campaign report, *Toronto as a Global City: Scorecard on Prosperity – 2014*, identified what tough choices must be made to raise our region’s economic future from simply “good enough” to “great.” *Toward a Toronto Region Economic Strategy* leads to a framework for a regional economic strategy and examines where Toronto excels, faces challenges, and provides opportunities for consideration for the region not only to become more economically productive, but also to be a more livable and prosperous region.

In the context of election year 2014, with municipal elections in the fall and provincial elections in all likelihood, the Board will use these reports as a platform for debate and discussion. We want to know how candidates plan to drive economic growth and job creation across the region.

However, our message is not confined just to government and elected officials. As representatives of businesses in the Toronto region, we know that economic strategies without the active involvement and leadership of the private sector go nowhere. In this respect, as the Board has done with its Human Health Sciences cluster initiative, we will continue to nurture innovative partnerships that bring together the region’s leaders in business, government, labour, academe, and civil society to generate and implement actionable solutions.

Our campaign is intended to be a launching pad for an active year of outreach and engagement by the Board and its partners. In short, we look forward to hearing about where you think the region’s economy needs to go, how we get there, and when.

The information contained in *Toward a Toronto Region Economic Strategy* would not have been possible without the substantial contributions of the Institute for Competitiveness & Prosperity and KPMG. Their research support and funding respectively have been invaluable in the creation of this document.

We would also like to thank the members of our Board of Directors, Policy and Advocacy Committee, and Economic Development Committee. They are business people who give their time and expertise to the Toronto Region Board of Trade in the service of creating a better and more prosperous Toronto region for all.

Beth Wilson  
FCPA, FCA  
Chair  
Toronto Region Board of Trade

Carol Wilding  
FCPA, FCA  
President & CEO  
Toronto Region Board of Trade
I am pleased to present *Toward a Toronto Region Economic Strategy* on behalf of the Institute for Competitiveness & Prosperity and the Toronto Region Board of Trade. It is an exciting time to be thinking about the future of the Toronto region and the Institute has been pleased to work with the Board in this endeavour. Since 2001, the Institute has strived to carry the torch on efforts to improve Ontario’s productivity and competitiveness. Tackling issues and challenges facing the Toronto region is of the utmost importance, as it generates nearly half of all economic output in the province.

This project forms a critical first step in developing the economic strategy needed to make the Toronto region more prosperous. While Toronto has many enviable strengths in areas such as labour force profile, livability, diversity, and industry clusters, it trails many other regions on key measures of economic performance. Between 2000 and 2010 (the latest decade for which data are available), the region’s productivity, defined as GDP per worker, declined by a staggering 6 percent in real terms. Toronto was the only region out of twelve North American metros to have experienced negative productivity growth over the period.

This presents a significant challenge for business leaders and public policy. The Board, with research support from the Institute, has proposed a target of 10 percent growth in productivity to be achieved by 2025. This will require an annual growth rate of 0.6 percent between 2010 and 2025. While this target may seem challenging, having a plan in place will help the region get there.

The Institute has provided a number of measures and key data points to be considered for the region to move forward. In doing so, the report aims to create a strategic framework that business leaders, policy makers, and other stakeholders can use to build a comprehensive plan for action. The Institute emphasizes that businesses should play the leading role in promoting progress, both by advocating for change on the public policy side and by finding ways to innovate and improve on a continual basis.

A great deal of the report’s research is focused on industry clusters using the methodology developed by Professor Michael E. Porter and Harvard’s Institute for Strategy and Competitiveness. Strong clusters are essential to sustain and boost the region’s competitiveness. Toronto has a solid group of traded clusters and is a leader in Financial Services, Processed Food, Life Sciences, and many other important clusters. The challenge will be to leverage these strengths to harness greater economic value.

The Institute gratefully acknowledges KPMG and the Institute for Strategy and Competitiveness at Harvard University for their contributions to this report’s research. I would also like to thank the Institute’s research team on this report, led by Ashleigh Ryan and supported by Weiru Shi and Dorinda So.

We look forward to sharing our findings and elevating the public discourse on the region’s economy as we move through this critical year. We thank the Board for the opportunity to take part in their “Think Twice, Vote Once – Decision 2014” campaign.

Roger L. Martin  
Chair, Institute for Competitiveness & Prosperity
EXECUTIVE SUMMARY
Toward a Toronto Region economic strategy
Toronto proves itself each year to be one of the most successful city regions in the world, with roughly 120,000 choosing it as their new home annually, numerous global businesses choosing to locate within its borders, and consistently high rankings on quality of life. Toronto stands in an enviable position to promote economic progress.
THE TORONTO REGION IS AT A CRITICAL JUNCTURE

THE WORLD IS CHANGING. City regions are increasingly defining the global economy as they become the epicentres of innovation, business activity and growth, and exchanges of people, ideas, goods, and services. The competition has never been more intense, and yet Toronto continues to be near the top of the pack. As the Toronto Region Board of Trade (the Board’s) Toronto as a Global City: Scorecard on Prosperity – 2014 showed, Toronto is ranked third overall out of twenty-four jurisdictions around the world.

The Toronto region is also the national leader by employment size in many important clusters, including Business Services, Financial Services, Publishing, Automotive, Processed Food, and Education and Knowledge Creation. It has a strong and diverse labour force, with nearly three-quarters of its population of working age and approximately half of its population born outside of Canada. The region produces almost half of the province’s economic output and almost 20 percent of the country’s.

Nonetheless, the Toronto region cannot ignore its long-term struggles on key economic indicators. Between 2000 and 2010 (the last ten years for which data are available), Toronto’s productivity, defined as real Gross Domestic Product (GDP) per worker, declined by 6 percent. These figures put Toronto in last place out of twelve North American peer city regions: Montréal, Vancouver, and Calgary in Canada and New York, Los Angeles, Chicago, Boston, Seattle, San Francisco, Dallas, and Atlanta in the United States. Clearly, Toronto has a major challenge to catch up to its competitor regions.

Exhibit 1: Toronto’s economic strategy builds on four pillars of regional competitiveness

| ECONOMIC VISION | DEVELOP STRONGLY ARTICULATED VISION AND ESTABLISH SHARED GOALS AND OBJECTIVES |
| BUSINESS-LED CLUSTER & OTHER COMPETITIVENESS INITIATIVES | SUPPORT ECONOMIC VISION THROUGH CLUSTER AND OTHER COMPETITIVENESS INITIATIVES |
| FOUNDATION INITIATIVES | SUPPORT ECONOMIC VISION THROUGH KEY FOUNDATION INITIATIVES |
| ORGANIZATION & IMPLEMENTATION | WORK TOWARDS STRONG REGIONAL GOVERNANCE |

1 The comparator regions used in this report were chosen based on the North American peers used in the Board’s annual Scorecard analysis, which include Montréal, Vancouver, and Calgary in Canada, and New York, Boston, Chicago, Dallas, Los Angeles, San Francisco, and Seattle in the United States. Atlanta was added as an additional comparison based on its size and industry makeup being similar to Toronto’s.
As the Board’s Scorecard on Prosperity 2014 pointed out, Toronto’s future trajectory should not be simply “good enough.” Toronto can achieve greatness by making strategic investments and policy choices that enhance the region’s global competitiveness. This report illustrates that Toronto has what it takes to remain competitive.

**TORONTO NEEDS A REGIONAL ECONOMIC STRATEGY TO CATCH UP TO COMPETITORS**

This is a critical year for Toronto, as voters head to the polls in municipal and likely provincial elections. This compelled the Board to launch the “Think Twice, Vote Once – Decision 2014” campaign to stimulate public dialogue on major issues facing the region and propose possible avenues to tackle some of its most pressing challenges. The campaign is built on four themes, with various corresponding reports.

This is the third document released as part of this campaign (following the election year campaign launch document, Think Twice, Vote Once – Decision 2014, and Scorecard on Prosperity 2014) and is an essential element of its mission. The Board has repeatedly heard from members, stakeholders, and other business leaders that Toronto is in great need of a regional economic strategy. Based on previous research, the Board found that stakeholders in competing regions such as Boston, Seattle, San Francisco, and Chicago have come together to rise above specific local and sectorial mandates to focus on shared regional visions and objectives. This alignment has resulted in comprehensive economic strategies that focus the collective efforts of all regional stakeholders, public and private, to drive prosperity growth and enhance the quality of life.

The Toronto region does not have such a strategy. This prompted the Board to partner with the Institute for Competitiveness & Prosperity (henceforth “the Institute”) to contribute to the development of a strategic framework that would serve as a starting block to fill this gap. This is the first of its kind for the Toronto region and aims to highlight areas where businesses can work toward heightened prosperity. The report proposes part of a framework for a regional economic strategy and examines where Toronto excels, faces challenges, and the areas for consideration for the region not only to become more economically productive, but also to become a more livable and prosperous region. While it will take some steps to reach the level of alignment, sophistication, and funding of the strategies of our competitors, this report strives to transform the growing public discourse into a stronger economic outlook.

**ECONOMIC GROWTH IS DrIVEN BY FOUR PILLARS OF REGIONAL COMPETITIVENESS**

The anatomy of the Board’s strategic framework is derived from four key pillars of regional economic competitiveness (Exhibit 1). These pillars, and much of the report, are based on the pioneering research of business theorist and Harvard Professor Michael E. Porter. They include: 1) Economic Vision; 2) Business-Led Cluster Initiatives; 3) Foundation Initiatives; and 4) Organization & Implementation.

The first pillar describes the overarching, long-term economic goals for the region, such as productivity enhancement and job growth. The second focuses on building the region’s industrial strength through cluster initiatives. The third pillar identifies foundation initiatives in crucial areas such as transportation, energy, smart technology, and human capital that will help grow the regional economy. The fourth pillar focuses on regional governance issues and how better organization and implementation within the region can advance the economic vision.

According to Porter, these pillars reinforce each other and do not necessarily need to be addressed sequentially. Actions and outcomes will take place in concert with one another to create economic momentum and strength. The Board has been significantly active in two of these pillars: Foundation Initiatives, including transportation and sound management of municipal finances; and Business-Led Cluster Initiatives in food and beverage and human health sciences.

Through regional comparisons, this report synthesizes the Board’s past efforts, identifies Toronto’s main pitfalls and strengths, and offers areas for consideration through a business-focused lens.

The economic vision put forward in this report sees the Toronto region as a place of high growth and high wages, where workers can attain maximum productivity in their jobs. It sets a hard target of achieving productivity growth between 2010 and 2025, reversing the decade of decline between 2000 and 2010. To meet this target, the region’s productivity will need to grow at an annual rate of 0.6 percent – an aspirational but crucial goal. Through the other three pillars of regional competitiveness, the Board provides suggestions for navigating toward this goal.

A large portion of the report examines industry clusters, a central component of most regional economic strategies. Strong clusters, particularly in traded industries as defined by Porter, have been shown to contribute to higher wages, stronger GDP and productivity growth, and thriving innovation. This report analyzes five representative clusters within the Toronto region in depth: Financial Services, Information Technology, Processed Food, Education and Knowledge Creation, and Life Sciences. These clusters were identified on the basis of their employment growth, size, and concentration within the Toronto region. While certainly not
**Exhibit 2: Toronto has four pillars of economic competitiveness that can boost its prosperity**

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<td><strong>Addressing gaps in productivity through the creation of a Productivity GTA</strong></td>
</tr>
</tbody>
</table>
an exhaustive group, these clusters are important industries in service and manufacturing sectors (both of which are essential for the region’s long-term prosperity) and have tremendous potential for growth and spillover effects. It is hoped that actions within these clusters will help boost others. Of course, many other clusters could also be considered for the development of coordinated business strategies.

The report also points to a number of foundation initiatives that could have significant impact on raising the Toronto region’s competitiveness. These foundation initiatives focus on tools that are vital to the region’s prosperity and economic functioning, such as transportation, energy, technology, and human capital. Without the ability to move people and goods and without the ability to power businesses and homes, the region will stagnate. Indeed, Toronto’s aging transportation and energy infrastructure are in dire need of attention. Boosting human capital and expanding the region’s use of smart technology will also capitalize on many areas of strength for Toronto, while increasing productivity potential.

The final pillar of regional competitiveness explored in the report is organization and implementation. Getting this right will involve all regional governance players working together to build on the economic vision put forward in this report. Without an effective system of governance to deal with issues such as transportation and investment promotion, the Toronto region will continue to miss out on its prosperity potential. Better regional governance can help the region build better transit, attract more business, and tackle core economic issues collectively. The Board offers a preliminary scope for areas where more effective regional governance could be of use.

In crafting this report, the Board and the Institute also worked with KPMG to conduct a series of e-Brainstorming sessions to consult with the Board’s members and other business leaders on the big issues facing the region. The sessions offered many valuable insights on issues such as public transit, productivity, innovation, access to capital, skilled labour shortages, red tape, and regional governance. What emerged clearly throughout the sessions was that Toronto has a number of formidable strengths, but that there are many issues, such as poor transit infrastructure and lack of regional cohesion, that demand attention.

Through analysis of a broad spectrum of economic and cluster data, as well as stakeholder consultations, the Board asked the Institute to focus on the four pillars of economic competitiveness for the Toronto region that will help it achieve its prosperity potential (Exhibit 2). These are structured around Porter’s four pillars of regional competitiveness and build off one another to strive toward a competitive, high-growth, high-wage economy.

More than simple areas for consideration, they offer a starting point for dialogue and regional interaction on promoting economic progress and competitiveness.

The guiding principle throughout this effort is that businesses should take the lead in strengthening the regional economy. Policy makers play a critical role in addressing infrastructure needs, improving our human capital stock, and creating the motivation for businesses to invest and grow. But without a vibrant business community and strong industry clusters, Toronto is destined to remain behind in the global economic race.

Now is the time for Toronto to begin the process of establishing a regional economic strategy to build its long-term future. This report addresses a number of areas of concern for the region with considerations for business leaders, policy makers, educators, mayoral candidates, provincial parties, and other stakeholders. What is clear is that a number of bold changes are needed, some long debated and overdue, and some largely overlooked. This strategic framework report makes significant headway in identifying where we need to act for economic activity to thrive, along with areas of potential opportunity within Toronto businesses and industries to accelerate growth. It is a starting point for dialogue, but most importantly, to begin the course of change.
THE TORONTO REGION NEEDS TO MAXIMIZE GROWTH
Toronto has a number of competitive advantages that have contributed to its status as one of the most prosperous urban regions in the world. However, on various key economic indicators, Toronto has room for improvement to increase productivity, GDP, and wages, and to lower the unemployment rate. Gains in these areas will raise the region’s overall prosperity. An economic vision for Toronto must build on the region’s strength and boldly address its challenges.
Toronto Region Board of Trade

In 2013, the Board added “Region” to its name, becoming the Toronto Region Board of Trade, signaling that Toronto’s economic strength comes not just from within the City’s borders but also from the Greater Toronto Area. As a region, Toronto is the location where businesses choose to put their headquarters, educated and talented labour resides, and innovation and productivity growth thrive.

It is integral that Toronto be seen and work as a region, an idea expressed repeatedly by the Board members surveyed in the KPMG e-Brainstorming session. Economists and planners define a region as an expansive and complex network of communities connected by a common environment, society, and economy. City regions are now the economic engines of countries, and the Toronto region is no exception.

Focusing on Toronto and creating regional strategies to bring talent and businesses to the region, spur innovation, and strengthen existing infrastructure are pivotal to long-term prosperity.

The 2012 Toronto Region Economic Summit invigorated the importance of developing a regional economic strategy and advancing focused cluster initiatives with businesses at the helm. This report is part of the framework for a regional economic strategy. It examines where Toronto excels, faces challenges, and the areas for consideration for the region not only to become more economically productive, but also to be a more livable and prosperous region. The Board has measured the labour attractiveness and economic strength of global cities including Toronto since 2009 in its Scorecard on Prosperity series and this report capitalizes on the mandate for the series that “what gets measured gets managed.” Therefore, this report provides another entry point into the measures that make Toronto great, the clusters that can propel productivity growth, and the foundation initiatives and organizational structures that underpin the region.

Exhibit 3: Toronto has a higher share of national economic activity than other regions

Toronto CMA and North American peer regions, 2010
Regional GDP as percent of national value (%)

Source: Institute for Competitiveness & Prosperity analysis based on data from the Organisation for Economic Co-operation and Development (OECD).

The Toronto Region has many strengths

- In the Toronto Region Board of Trade’s Scorecard on Prosperity – 2014, Toronto ranks third overall among twenty-four peer jurisdictions, as a result of US and European metros faring worse.

- Toronto has the highest share of national Gross Domestic Product (GDP) among the North American peer jurisdictions, contributing 18.5 percent of Canada’s GDP and 45 percent of Ontario’s GDP, and making the region the economic engine of the country (Exhibit 3).

2 Toronto and the Toronto region all refer to the Toronto CMA, as defined by Statistics Canada, and are used synonymously in this report.
5 Toronto Region Board of Trade, Toronto as a Global City: Scorecard on Prosperity – 2014, 2014.
Toronto business leaders show concern for transportation and regional governance

The Board and the Institute recently teamed up with KPMG to host a series of e-Brainstorming sessions with Board members and other senior executives across the region. The sessions aimed to gauge business leaders’ perspectives on Toronto’s economic performance and how the region can improve. The sessions revealed a number of pressing concerns and areas for improvement.

- **Transportation proved to be the biggest issue facing the region.**
  Low productivity due to gridlock and long commutes was the most frequently cited concern among respondents and more people highlighted better transportation infrastructure as the most crucial thing needed to make the Toronto region more competitive than any other issue. This illustrates the importance of efficient infrastructure to the functioning of the region and the need for governments at all levels to make substantial investments.

- **Better links need to be made between our education system and business needs.** The majority of respondents claimed that the availability of skilled labour in the region is extremely important for their organization, yet many also expressed concern over the “skills mismatch” issue. Greater promotion of co-op, internship, and apprenticeship training were offered as solutions to help foster a better-trained workforce. Many also argued that educators need to align students with work opportunities and in-demand skills to help them better integrate into the workplace.

- **The region needs to think and act like a region.** Increased collaboration, coordination, and governance were raised as key requirements to establish a more competitive region for several respondents. It is clear that to succeed as a global city, Toronto needs to draw on the strength and economy of the entire region rather than any one player.

For more information on the KPMG e-Brainstorming sessions including detailed results, please see Appendix IV.
• Educational attainment – Share of population with a post-secondary degree, diploma or certificate
• Economic prosperity – Productivity, as measured by real GDP or output per worker, which is the Institute’s definition of economic prosperity.

When compared to peer jurisdictions and across time, these indicators provide a context for Toronto’s economy and the potential for the region’s growth.

Annual employment growth is high. Since 2002, the number of employed grew from 2.5 million to 2.8 million in 2010 and 2.9 million in 2012 and the region created approximately 350,000 new jobs over ten years. This puts Toronto in fourth place by employment size (in 2010), following New York (7.3 million), Los Angeles (4.9 million), and Chicago (3.8 million). It is also the third fastest growing region by employment among its North American peers.

Unemployment is relatively high. Toronto’s unemployment rate was 7.8 percent in 2012, ranked seventh highest among its North America peers in 2012. The region’s unemployment rate tops the list of other large CMAs in Canada: 7.7 percent in Montréal, 4.6 percent in Calgary, and 6.7 percent in Vancouver. Nonetheless, Toronto performed better in this area compared to most of its US peers, such as San Francisco (10.4 percent), Los Angeles (10.4 percent), Atlanta (9.1 percent), New York (8.9 percent), Chicago (8.7 percent), and Seattle (8.3 percent).

Population growth is high. The Toronto CMA had a population of 6.6 million people in 2013. The region grew by nearly 24 percent between 2000 and 2013. Of the peer regions with a population of 5 million or more in 2012, this growth was second only to that in Atlanta. Similarly, the working age population of those between the ages of 15 and 64 experienced a compound annual growth rate of 2.1 percent over the same period.

Toronto continues to be the most attractive destination for immigrants to Canada. Of the 1.2 million immigrants who arrived between 2006 and 2011, 32.8 percent settled in Toronto – more than in other Canadian CMAs such as Montréal and Vancouver, which garnered shares of 16.3 percent and 13.3 percent of new immigrants, respectively. Toronto’s attraction to Canadian immigrants has made it the most diverse Canadian metropolitan region. In 2011, Toronto had the highest percentage of foreign-born residents (46 percent of total residents) than any other Canadian CMA or US peer region. Immigration has increased the overall percentage of working age individuals, as immigrants are more likely to be between the ages of 15 and 64 than individuals born in Canada (77 percent versus 64 percent).

Increased urbanization leads to numerous economic benefits. Previous Institute research found a positive relationship between the degree of urbanization in a region and labour productivity. Higher levels of urbanization, where individuals and firms are located in close proximity to related players within their respective industry clusters, increase opportunities for collaboration and the agglomeration effects of being closer to suppliers and skilled employees.

Educational attainment is high. In 2012, more than 56.7 percent of Toronto region residents aged 25 and older had some form of post-secondary education, which includes certificates, diplomas, and degrees from colleges, polytechnics, and universities. Toronto’s educational attainment is higher than Montréal’s, at 66.7 percent, and Vancouver’s, at 55.8 percent. Yet, all US peers regions have a greater rate of post-secondary educational attainment than Toronto. San Francisco has the highest share, at 70.1 percent, followed by Seattle (69.8 percent), Boston (65.9 percent), Atlanta (62.5 percent), Chicago (61.4 percent), Dallas (60.7 percent), New York (58.5 percent), and Los Angeles (58.2 percent).

Economic prosperity fell. Productivity is the main driver of prosperity. Toronto’s real GDP per worker in 2010 (the last year available from the OECD) was $68,200 in 2005 US dollars, which was greater than Montréal’s and Vancouver’s, respectively.
yet was lower than Calgary’s and every other peer region in the United States. Additionally, real GDP per worker in Toronto actually fell over the ten-year period by 6 percent. San Francisco was the peer leader in both the overall productivity level in 2010 and growth between 2000 and 2010. Output per worker was $152,865 in US 2005 dollars with growth of 22.4 percent over the ten-year period.

THE TORONTO REGION HAS YET TO CAPITALIZE FULLY ON ITS ADVANTAGES

Between 2000 and 2010, the Toronto region ranked tenth out of twelve jurisdictions in productivity against its North American peer regions and experienced negative productivity growth during the same period (Exhibit 4). To realize fully the region’s economic potential, an economic vision for Toronto must address this challenge.

Exhibit 4: Toronto experienced negative productivity growth, 2000-2010

<table>
<thead>
<tr>
<th>Productivity growth (%)</th>
<th>Real GDP per worker (US $2005)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25%</td>
<td>20,000</td>
</tr>
<tr>
<td>20%</td>
<td>40,000</td>
</tr>
<tr>
<td>15%</td>
<td>60,000</td>
</tr>
<tr>
<td>10%</td>
<td>80,000</td>
</tr>
<tr>
<td>5%</td>
<td>100,000</td>
</tr>
<tr>
<td>0%</td>
<td>120,000</td>
</tr>
<tr>
<td>-5%</td>
<td>140,000</td>
</tr>
<tr>
<td>-10%</td>
<td>160,000</td>
</tr>
</tbody>
</table>

Note: Values calculated at 2005 purchasing power parity.
Source: Institute for Competitiveness & Prosperity analysis based on data from the Organisation for Economic Co-operation and Development (OECD).
Economic Vision for Toronto is to Achieve 10 Percent Productivity Growth by 2025

The economic vision sees Toronto in 2025 as a place of high growth and high wages, in which workers are matched to their jobs. This vision is driven mainly by the development of strong clusters and a resilient business environment. One of the best measures of this higher standard of living is productivity growth, which generates increased prosperity. This economic vision sees the region moving from a ten-year negative productivity growth rate (defined by real GDP per worker) to increasing productivity 10.0 percent from its 2010 level (the latest year available) by 2025 (Exhibit 5). Toronto must achieve an annual productivity growth rate of 0.6 percent to reach its 2025 goal. This would add $6,800 in US 2005 dollars of GDP to each worker from the 2010 level, which would boost prosperity throughout the region.

To achieve this vision, Toronto must build on the strength of its regional clusters. This requires increasing their innovation output, which is essential to raising productivity and creating the conditions necessary for sustained economic growth.

Increasing productivity is a long-term task and requires strong leadership to meet the challenges facing the region. In *Think Twice, Vote Once – Decision 2014*, the Board urged leaders to step up and make hard decisions about regional transportation, municipal finances, job creation, and the prosperity gap. Nonetheless, this goal is well within Toronto’s reach and through increased collaboration between businesses, governments, organizations, academe, and workers, Toronto can become a more productive and livable region.

The time for action is now for leaders from business, government, labour, community organizations, and academe to collaborate and work together to achieve this vision. This report contributes to a framework for a regional economic strategy as the starting point to move the conversation forward. A productivity growth rate of 0.6 percent each year is possible. Other regions in Canada have achieved this during the same period and there is no reason why Toronto cannot. But the region must start now, leverage its strength in traded clusters, and create a solid foundation for productivity growth to move up the prosperity ranking within the next decade.

Toronto has the right tools for success in the global economy. But compared to the most prosperous jurisdictions in North America, there is room for improvement. This report proposes an ambitious but highly feasible target for Toronto: to achieve growth in GDP per worker of at least 10.0 percent between 2010 and 2025. This would reverse the region’s previous decade of decline and put the region on a path to reach its prosperity potential.

Exhibit 5: Economic vision for the Toronto region targets productivity growth

<table>
<thead>
<tr>
<th>Year</th>
<th>GDP per Worker</th>
<th>10-Year GDP per Worker Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>$68,200</td>
<td>-6.0%</td>
</tr>
<tr>
<td>2025</td>
<td>$75,000</td>
<td>10.0%</td>
</tr>
</tbody>
</table>

Note: All dollar figures in 2005 US dollars.
Source: Institute for Competitiveness & Prosperity analysis based on data from the Organisation for Economic Co-operation and Development (OECD).
Toronto’s low productivity could be attributed to many economic performance factors

<table>
<thead>
<tr>
<th>LOW PRODUCTIVITY CAN BE CAUSED BY...</th>
<th>AS MEASURED BY...</th>
<th>TORONTO’S POSITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of innovation or technology adoption</td>
<td>Number of patents produced</td>
<td>Lowest among North American peers</td>
</tr>
<tr>
<td>Cluster underperformance</td>
<td>Share of traded cluster employment</td>
<td>Decreased from 43.7 percent in 2001 to 38.1 percent</td>
</tr>
<tr>
<td>Lack of growth in high value traded clusters</td>
<td>Wages and employment growth</td>
<td>Wages are lower than those of North American peers</td>
</tr>
<tr>
<td>Low human capital potential</td>
<td>Educational attainment</td>
<td>Lower than North American peer median</td>
</tr>
<tr>
<td>Ailing infrastructure</td>
<td>Gap between actual spending on infrastructure and what is needed</td>
<td>$30 billion infrastructure deficit*</td>
</tr>
</tbody>
</table>

* For Ontario alone, the Association of Municipalities of Ontario in their June 2008 Working Paper estimated that to close the estimated gap between actual infrastructure spending and what is needed would require at least $5.9 billion a year over the next ten years. This spending estimate includes transportation; water systems, wastewater systems, and storm water systems; solid waste facilities; parks; and municipal buildings. Given that the infrastructure gap has yet to be addressed in any significant way, this figure surely underestimates the magnitude of the current gap. Toronto’s infrastructure gap is estimated to be around $30 billion, roughly equivalent to half of the Ontario total.
2

BUSINESS-LED CLUSTER INITIATIVES

STRONG CLUSTERS DRIVE PROSPERITY AND INNOVATION
Toronto’s industry mix is one of its greatest assets, and clusters are central to the development of a diverse and prosperous economy. Toronto must leverage the full potential of its strong clusters in services and manufacturing to match the productivity growth of its North American peers.
TRADED CLUSTERS ARE CRITICAL FOR TORONTO’S PROSPERITY

CLUSTERS ARE GEOGRAPHICALLY proximate groups of interconnected companies, suppliers, service providers, and associated institutions in a particular field. Examples of clusters are Financial Services in New York’s Wall Street, Medical Devices in Boston, and IT in Seattle and Silicon Valley. Economic and business strategists have long looked to cluster theory to determine regional strengths and weaknesses.

Regional economies are composed of three main types of activities:

- **Local clusters** are found everywhere and produce goods and services that are needed by the local population (e.g., retail trade).
- **Traded clusters** produce goods and services in a particular locale, and then distribute them across the nation or to other countries (e.g., Automotive, Medical Devices). These clusters are concentrated only in a handful of regions.
- **Natural resource clusters** are found in locations where a particular natural resource is abundant.

The focus of this report is on traded clusters as they are main drivers of prosperity because of their high concentration, wealth creation, and export activities.

Exhibit 6: Toronto has lower wages but a larger share of traded clusters than North American peers

<table>
<thead>
<tr>
<th>REGION</th>
<th>SHARE OF TRADED CLUSTERS (%)</th>
<th>RANK</th>
<th>AVERAGE ANNUAL EARNINGS IN TRADED CLUSTERS (C$2010, PPP)</th>
<th>RANK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toronto</td>
<td>38.3</td>
<td>2</td>
<td>$45,700</td>
<td>10</td>
</tr>
<tr>
<td>Atlanta</td>
<td>27.6</td>
<td>11</td>
<td>$66,100</td>
<td>6</td>
</tr>
<tr>
<td>Boston</td>
<td>31.7</td>
<td>6</td>
<td>$81,700</td>
<td>2</td>
</tr>
<tr>
<td>Calgary</td>
<td>38.6</td>
<td>1</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Chicago</td>
<td>28.4</td>
<td>10</td>
<td>$69,900</td>
<td>5</td>
</tr>
<tr>
<td>Dallas</td>
<td>29.0</td>
<td>9</td>
<td>$63,700</td>
<td>7</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>34.0</td>
<td>4</td>
<td>$55,800</td>
<td>8</td>
</tr>
<tr>
<td>Montréal</td>
<td>34.3</td>
<td>3</td>
<td>$43,800</td>
<td>11</td>
</tr>
<tr>
<td>New York</td>
<td>27.4</td>
<td>12</td>
<td>$80,100</td>
<td>3</td>
</tr>
<tr>
<td>San Francisco</td>
<td>32.2</td>
<td>5</td>
<td>$84,000</td>
<td>1</td>
</tr>
<tr>
<td>Seattle</td>
<td>30.6</td>
<td>8</td>
<td>$70,300</td>
<td>4</td>
</tr>
<tr>
<td>Vancouver</td>
<td>31.6</td>
<td>7</td>
<td>$46,200</td>
<td>9</td>
</tr>
</tbody>
</table>

Note: Due to data limitations, average wages for Calgary were unavailable. Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada, Canadian Business Patterns, and Research of Professor Michael E. Porter and the Cluster Mapping Project.

ENHANCING STRONG TRADED CLUSTERS IS CENTRAL TO TORONTO’S CLUSTER STRATEGY

Clusters energize the regional and national economy in many ways. Previous research by the Institute concluded that clusters enable better access to specialized inputs, services, employees, information, institutions, and training programs to increase productivity and efficiency. Clusters enhance competition and transactions across firms and facilitate rapid diffusion of best practices. Clusters also enable firms to compare themselves to regional competitors, providing strong incentives for improvement from benchmarking. Businesses are also more likely to invest and locate offices or headquarters (which are the main drivers of productivity) in regions where their cluster is strong.

While local clusters account for the majority of employment in most regions, traded clusters are the drivers of prosperity and growth. Average wages in traded clusters are much higher than wages in local clusters because of their higher productivity achieved as a result of being unconstrained by the size of the local markets. Their success also stimulates demand for local clusters.

Toronto has an advantage in traded clusters. In 2012, traded clusters accounted for 38.1 percent of Toronto’s total employment versus 34.0 percent in Ontario and 32.7 percent in Canada. Toronto has the second highest concentration of traded clusters and fourth largest absolute size of traded clusters among the North American peer city.

14 The clusters described below are based on Michael E. Porter’s definitions. For example, the Entertainment cluster does not align with the definition of Entertainment and Creative cluster as put forth by the Ontario Ministry of Tourism, Culture, and Sport. Please see Appendices I and II for methodology.
Toronto ranked first in terms of employment in twenty-six clusters in 2012. However the trend in employment growth is less positive than expected. Between 2001 and 2012, only ten out of forty-one traded clusters experienced declining, as their share in the regional economy is shrinking. Thus, attracting talented people and improving competitiveness will be more challenging for Toronto than other regions in the long run.

As Canada’s economic headquarters, regions (Exhibit 6). However a larger share of traded clusters in the economy does not guarantee prosperity; Toronto trails its peers in wages, ranking second last among its North American peers. Moreover, Toronto’s traded clusters are
Toronto’s economic growth was mainly driven by the Financial Services cluster (Exhibit 7). It is worth noting that Financial Services alone has created more jobs than the next ranked nine clusters combined.

**TORONTO NEEDS A DIVERSE RANGE OF CLUSTERS**

Solid and sustainable economic growth is highly dependent on having a diverse portfolio of well-performing clusters. Like a balanced investment portfolio, it not only protects the region from the inevitable ups and downs of global markets, but also drives cross-cluster collaboration and business development. Financial Services, for instance, requires support from a variety of interconnected clusters, such as Business Services, Information Technology, and Education and Knowledge Creation. In the context of the Toronto region, this synergy is at play with all three of these clusters experiencing growth since 2001. However, there are cautionary notes. While Financial Services achieved tremendous growth since 2001, other clusters on the top twenty list experienced slower or even negative growth over the period.

Financial Services ranks as the largest cluster in the Toronto region with a total employment of 263,000 people, followed by Business Services, Education and Knowledge Creation, Distribution Services, and Hospitality and Tourism (Exhibit 8). Transportation and Logistics, Automotive, Processed Food, Publishing and Printing, and Entertainment also rank in the top ten. Among these top ten traded clusters by employment, alarmingly only five of

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**Exhibit 8: Only nine of the top 20 traded clusters in the Toronto region grew between 2001 and 2012**

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Financial Services</td>
<td>263,000</td>
<td>5.2%</td>
<td>2.09</td>
<td>39.6%</td>
<td>$60,400</td>
<td>2.5%</td>
</tr>
<tr>
<td>2</td>
<td>Business Services</td>
<td>168,000</td>
<td>-1.3%</td>
<td>1.46</td>
<td>27.7%</td>
<td>$56,500</td>
<td>3.4%</td>
</tr>
<tr>
<td>3</td>
<td>Education and Knowledge Creation</td>
<td>76,300</td>
<td>2.1%</td>
<td>0.83</td>
<td>15.7%</td>
<td>$44,500</td>
<td>2.4%</td>
</tr>
<tr>
<td>4</td>
<td>Distribution Services</td>
<td>75,700</td>
<td>0.4%</td>
<td>1.79</td>
<td>34.0%</td>
<td>$48,300</td>
<td>2.1%</td>
</tr>
<tr>
<td>5</td>
<td>Hospitality and Tourism</td>
<td>51,900</td>
<td>1.0%</td>
<td>0.84</td>
<td>15.9%</td>
<td>$40,600</td>
<td>1.3%</td>
</tr>
<tr>
<td>6</td>
<td>Transportation and Logistics</td>
<td>46,900</td>
<td>1.1%</td>
<td>1.08</td>
<td>20.4%</td>
<td>$47,400</td>
<td>3.6%</td>
</tr>
<tr>
<td>7</td>
<td>Automotive</td>
<td>36,000</td>
<td>-1.9%</td>
<td>1.50</td>
<td>28.4%</td>
<td>$49,100</td>
<td>3.0%</td>
</tr>
<tr>
<td>8</td>
<td>Processed Food</td>
<td>33,900</td>
<td>-1.6%</td>
<td>1.04</td>
<td>19.7%</td>
<td>$34,900</td>
<td>0.1%</td>
</tr>
<tr>
<td>9</td>
<td>Publishing and Printing</td>
<td>33,600</td>
<td>-0.9%</td>
<td>2.08</td>
<td>39.4%</td>
<td>$41,400</td>
<td>0.5%</td>
</tr>
<tr>
<td>10</td>
<td>Entertainment</td>
<td>33,500</td>
<td>-1.8%</td>
<td>0.87</td>
<td>16.5%</td>
<td>$33,900</td>
<td>0.7%</td>
</tr>
<tr>
<td>11</td>
<td>Information Technology</td>
<td>25,600</td>
<td>1.6%</td>
<td>1.40</td>
<td>26.5%</td>
<td>$54,300</td>
<td>2.3%</td>
</tr>
<tr>
<td>12</td>
<td>Heavy Construction Services</td>
<td>24,700</td>
<td>5.0%</td>
<td>0.45</td>
<td>8.6%</td>
<td>$46,500</td>
<td>1.2%</td>
</tr>
<tr>
<td>13</td>
<td>Metal Manufacturing</td>
<td>20,200</td>
<td>-3.8%</td>
<td>1.09</td>
<td>20.6%</td>
<td>$46,000</td>
<td>2.4%</td>
</tr>
<tr>
<td>14</td>
<td>Building Fixtures, Equipment and Services</td>
<td>19,900</td>
<td>-2.5%</td>
<td>1.42</td>
<td>27.0%</td>
<td>$37,900</td>
<td>0.6%</td>
</tr>
<tr>
<td>15</td>
<td>Plastics</td>
<td>19,400</td>
<td>-1.7%</td>
<td>1.45</td>
<td>27.5%</td>
<td>$52,100</td>
<td>4.6%</td>
</tr>
<tr>
<td>16</td>
<td>Production Technology</td>
<td>14,000</td>
<td>-1.2%</td>
<td>1.14</td>
<td>21.7%</td>
<td>$48,500</td>
<td>1.7%</td>
</tr>
<tr>
<td>17</td>
<td>Power Generation and Transmission</td>
<td>13,800</td>
<td>2.9%</td>
<td>1.15</td>
<td>21.9%</td>
<td>$56,300</td>
<td>1.7%</td>
</tr>
<tr>
<td>18</td>
<td>Biopharmaceuticals</td>
<td>9,800</td>
<td>-1.6%</td>
<td>2.17</td>
<td>41.2%</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>19</td>
<td>Medical Devices</td>
<td>6,900</td>
<td>1.8%</td>
<td>1.42</td>
<td>26.9%</td>
<td>$45,200</td>
<td>2.3%</td>
</tr>
<tr>
<td>20</td>
<td>Analytical Instruments</td>
<td>6,900</td>
<td>-3.1%</td>
<td>1.24</td>
<td>23.6%</td>
<td>$55,100</td>
<td>2.0%</td>
</tr>
<tr>
<td></td>
<td>Regional Average</td>
<td>2,874,000</td>
<td>1.2%</td>
<td>1.00</td>
<td>19.0%</td>
<td>$44,800</td>
<td>2.4%</td>
</tr>
</tbody>
</table>

Note: CAGR is the compound annual growth rate.
Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada, Canadian Business Patterns and Research of Professor Michael E. Porter and the Cluster Mapping Project.
them enjoyed positive growth between 2001 and 2012.

**SPECIALIZED CLUSTERS ARE FUNDAMENTAL TO THE NEXT DECADE’S PROSPERITY**

To address the underperformance of Toronto’s clusters, business leaders and other cluster players, such as government, academia, and labour, should consider developing collaborative strategies to promote their growth and competitiveness. Of course, most industry clusters evolve organically, stimulated by the large and dense critical mass of people, firms, and other institutions that migrate to certain places over time. However, businesses working together with cluster partners can implement initiatives that boost the competitiveness of firms in areas like innovation, workforce development, and export promotion.

To assess the region’s strong clusters, the Institute analyzed employment trends for each traded cluster against nation-wide employment in each respective cluster. In Exhibit 9, Toronto’s share of national cluster employment is shown on the vertical axis while the percentage point change in share of national employment between 2001 and 2012 is shown on the horizontal axis. Toronto as a region accounted for 19.0 percent of national employment in 2012; therefore, the base of 19.0 percent has been set as the horizontal baseline. Clusters located above the horizontal baseline enjoyed a relatively higher share of national employment than the regional average, which indicates these clusters have a strong concentration in the region. Meanwhile, clusters located below the horizontal baseline had a relatively lower share of national employment compared to the region overall.

Toronto’s overall share of national employment dropped by 0.4 percentage points between 2001 and 2012. Hence, -0.4 has been set as the vertical baseline. Clusters to the right of the vertical baseline grew faster than the expected growth, whereas, clusters to the left of the vertical baseline grew more slowly than expected (Exhibit 9).

Specialized clusters are located above the horizontal baseline, as they enjoy a relatively higher share of employment than the national average, indicating a strong concentration in the region. The Toronto region has twenty-one specialized clusters among the forty-one traded clusters. Among them are six clusters that have also been gaining rapidly in share of national employment. Labelled as “High Performing Clusters,” they include:

- Financial Services
- Transportation and Logistics
- Power Generation and Transmission
- Medical Devices
- Automotive
- Tobacco.

**Exhibit 9: Toronto has six high performing clusters**

![Exhibit 9: Toronto has six high performing clusters](image-url)
Clusters with a relatively high share that have been losing national share include:

- Business Services
- Publishing and Printing
- Distribution Services
- Biopharmaceuticals
- Processed Food
- Information Technology
- Analytical Instruments
- Metal Manufacturing
- Production Technology
- Building Fixtures, Equipment and Services
- Plastics
- Lighting and Electrical Equipment
- Leather and Related Products
- Jewellery and Precious Metals
- Chemical Products.

Clusters with a lower share of national employment but that have experienced a change in their national share over the period that is faster than the regional average include:

- Communications Equipment
- Hospitality and Tourism
- Education and Knowledge Creation
- Furniture
- Footwear
- Heavy Machinery
- Fishing and Fishing Products
- Oil and Gas Products and Services.

It is important to keep in mind that other regions in Canada (namely in western provinces) have experienced rapid economic and population growth, which has caused Toronto’s national share of many clusters to decline. However, this does not necessarily mean these clusters are weak. The presence of more national competition in these clusters could substantially benefit them. Opportunities for growth exist within all clusters, and it is critical that the region focus on overall cluster strength rather than any one strong cluster.

HOW CAN TORONTO IMPROVE ITS CLUSTER ENVIRONMENT AND ENHANCE ITS STRONG CLUSTERS?

Urban economists and business strategists generally accept Porter’s diamond as a valuable tool to analyze and enhance the quality of a region’s cluster environment (Exhibit 10). Once a cluster forms, the industries within become mutually reinforcing and exchange resources freely through the diamond model. No one feature in Porter’s framework is sufficient for cluster effectiveness, but together they enhance economic output in a way that is greater than the sum of each part. Specifically, in Porter’s model, four factors determine regional competitiveness and innovation capacity.

Exhibit 10: Four factors determine regional productivity

• Processed Food
• Education and Knowledge Creation
• Life Sciences (Biopharmaceuticals and Medical Devices).

These clusters were analyzed based on their size in the Toronto region (as measured by employment), location quotient or LQ (how concentrated employment is in the region), and their positive spillover effects on other clusters. All of the clusters in this report fall within the top twenty clusters in the region by employment size. All but Education and Knowledge Creation have a location quotient of at least 1.0, and most experienced employment growth that was above the regional average.

As previously mentioned, part of the rationale for examining these clusters was their broad and positive spillover effects across the region. While Power Generation and Transmission, Transportation and Logistics, and Distribution Services were all high performing clusters in Toronto, their growth depends on the health and vitality of other clusters. For example, growth in the Processed Food cluster will invariably drive demand for Transportation and Logistics Services. Additionally, as population and economic activity grow, these clusters are also likely to grow as well, benefitting from agglomeration economies. Indeed, strong Financial Services, Education and Knowledge Creation, and Information Technology clusters have the potential to produce a multiplier effect on the economy, as these clusters are key drivers of productivity for all businesses. The Board hopes to initiate a dialogue on ways businesses can help bolster the regional economy through a range of potential initiatives in these clusters.
The Financial Services cluster in Toronto experienced the greatest growth in employment since 2001, adding more than 100,000 jobs. It is the largest cluster in the Toronto region, employing 263,000 workers or 10 percent of the labour force in 2012 (Exhibit 11). It is second only to New York City in employment size. The level of employment in the Toronto region within Financial Services is not only significant in comparison to that of its peers, but also within the regional economy. Even throughout the recession years when other cities’ financial sectors were declining, Toronto’s experienced significant growth. Given its prominence in the Toronto region economy, productivity increases in the Financial Services cluster have the potential to deliver big gains for the region as a whole.
Exhibit 11: Financial Services cluster is the largest in the Toronto region

Financial Services cluster employment by sub-cluster, Toronto CMA, 2012

**Depository Institutions 53.1%**
**Securities, Brokers, Dealers and Exchanges 41.8%**
**Insurance Products 4.9%**
**Passenger Car Leasing 0.2%**

263,000 EMPLOYEES
10% OF THE TORONTO WORKFORCE

Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada, Canadian Business Patterns.

### STRENGTHS

- **STABLE FINANCIAL REGULATORY ENVIRONMENT** helped Canada weather the 2009 recession
- **LARGEST FINANCIAL SERVICES CLUSTER** by employment in Ontario and Canada, and second in North America, behind New York
- **THIRD HIGHEST CONCENTRATION OF EMPLOYMENT** in North America, behind New York and Boston
- **HIGHLY EDUCATED WORKFORCE**: 58.1 percent of employees have a bachelor’s degree or higher
- **CONTRIBUTION SHARE** of the region’s productivity is greater than its share of employment
- **LOWER BUSINESS COSTS** than many North American cities
- **FOREIGN DIRECT INVESTMENT** (FDI) and exporting of services have increased

### CHALLENGES

- **POSSIBILITY OF FREQUENT CHANGES** to the domestic regulatory environment in light of new global regulations and compliance requirements

### AREAS FOR CONSIDERATION

- **OPPORTUNITIES** to streamline compliance requirements to facilitate greater innovation (e.g., uptake of new software)
- **DIVERSIFICATION OF REVENUE SOURCES** through consideration of exports and investments in new global markets
FINANCIAL SERVICES IS A SUBSTANTIAL CONTRIBUTOR TO TORONTO’S ECONOMY

The Financial Services cluster is made up of five sub-clusters: Depository Institutions, such as banks and credit unions; Security Brokers, Dealers, and Exchanges; Insurance Products; Real Estate Investment Trusts; and Passenger Car Leasing. Toronto’s Financial Services cluster is almost entirely composed of two sub-clusters: Depository Institutions and Securities Brokers, Dealers and Exchanges, with employment shares of 53.1 percent and 41.8 percent, respectively.

The 2010 Location Quotient (LQ) for Toronto’s Financial Services cluster is 1.88, which among peers only trails Boston at 2.02 and New York at 2.28 (Exhibit 12). This means that employment within the Financial Services cluster is relatively more concentrated within Toronto than most other peer regions. Thus, this cluster is also more significant to the Toronto economy than almost all other peers.

TORONTO’S FINANCIAL SERVICES CLUSTER HAS MANY STRENGTHS

The stable regulatory environment surrounding the Financial Services cluster in the Toronto region was integral to weathering the 2009 recession. As the largest cluster, it ranks well among its peer regions in both size and LQ. It has a highly educated workforce, lower business costs, and an increasing global presence. There has also been a lot of work done in this cluster to improve its competitiveness, notably advanced by the work of the Boston Consulting Group for the Toronto Financial Services Working Group in the Partnership and Action: Mobilizing Toronto’s Financial Sector for Global Advantage Action Plan. The Action Plan outlines excellent recommendations for skilled labour, government, and businesses to work together to address issues that many of them face such as retirement financing, risk analysis amid new global regulatory standards, and improving Toronto’s attractiveness abroad as a place for investment. The Action Plan also highlights that by improving cluster activity, between 10,000 and 20,000 jobs can be created in the Toronto region.16

The Board looks forward to seeing the strides made by this cluster, drawing on its existing strengths that are unique to the Toronto region.

Employees are highly educated.
The Financial Services cluster benefits from a highly educated workforce. Fully 40.5 percent of workers in Financial Services have a bachelor’s degree, and 17.6 percent have a graduate degree, proportions that are higher than in most industries except for those employed in positions in government, education, or sciences that have high educational requirements. An educated workforce has more skills and knowledge that support innovation initiatives and projects, therefore warranting higher pay. In 2012, the average annual salary in Financial Services was $60,400, which is significantly above the average

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Exhibit 12: Toronto’s Financial Services cluster is important to the regional economy

<table>
<thead>
<tr>
<th>Location quotient</th>
<th>Total regional employment 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
<td>50,000</td>
</tr>
<tr>
<td>2.0</td>
<td>100,000</td>
</tr>
<tr>
<td>1.5</td>
<td>150,000</td>
</tr>
<tr>
<td>1.0</td>
<td>200,000</td>
</tr>
<tr>
<td>0.5</td>
<td>250,000</td>
</tr>
<tr>
<td>0.0</td>
<td>300,000</td>
</tr>
<tr>
<td>0.0</td>
<td>350,000</td>
</tr>
<tr>
<td>0.0</td>
<td>400,000</td>
</tr>
</tbody>
</table>

Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada, Canadian Business Patterns, and the research of Michael E. Porter and the Cluster Mapping Project.
for the Toronto region ($40,680 in the same year). The higher wages are also indicative of the greater share of GDP contributed by Financial Services workers. The Financial Services cluster employs 10 percent of the Toronto workforce but generates 14 percent of the region’s GDP. This points to higher productivity levels within the cluster, producing more prosperity for citizens, businesses, and governments via higher wages, profits, and taxation revenue.

**Business costs are lower.** Another key strength of the Financial Services cluster is that business costs are lower in Toronto than in US peer cities by more than 20 percent (Exhibit 13). Costs such as land/building costs, utility prices, personal taxes, and housing costs are lower in Toronto compared to an index of the US national average. Lower costs in Toronto in comparison to US peers indicate that the region is more attractive from an operations standpoint to businesses in the Financial Services industry.

**Global presence is growing.** Financial Services companies in Toronto also have a strong global presence through exports (mainly to the United States and European Union) and foreign direct investment (FDI). While banking service exports decreased between 2000 and 2011 to less than one-third of total exports, other financial services such as commissions and fees for asset management and securities transactions increased to 45 percent. Insurance product exports remained steady during the time. Overall, Canada’s exports of financial services more than doubled in the last decade.

The 2009 recession helped Toronto’s financial sector, as Canada’s relative economic stability spurred many in the United States and European Union to look to Canada to provide the financial services they required. There was considerable growth in these exports from 2009 onward. Furthermore, Canadian banks merged, acquired, and set up their own branches in other countries. This foreign direct investment is integral to revenues. Conversely, the Financial Services sector makes up half of Canada’s outward FDI stock. In the case of Scotiabank, 46 percent of its revenues originated from non-Canadian sources, predominantly from countries other than the United States. Similarly, in 2012, 71 percent of Manulife Financial’s and 52 percent of Sun Life Financial’s revenues were from outside Canada. The trade surplus from heavy exporting of financial services primarily from Toronto increased Canada’s trade balance by $2 billion in 2012.

**AREAS FOR CONSIDERATION**

**Opportunities to streamline the regulatory environment.** The Canadian Banking Association, in its submission to the House of Commons Standing Committee on Finance as part of the 2011 Pre-Budget consultations, recognized the stability of the banking sector.

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17 Data from Statistics Canada, Labour Force Survey, 2012. Workers aged 25 to 64 in the Toronto CMA finance and insurance sectors were included. All hourly wages are in current dollars.


21 Ibid.
Diversification of revenue sources through consideration of exports and investments in new global markets. While financial firms’ increasing international presence will boost profits and drive growth, this also increases their exposure to the changing economic conditions in these countries. Strengthening the economic bases of these firms will require, among other things, expanding into other countries through exports and investments.

system in Canada, which was integral to weathering the 2009 recession. However, the Association warned of the adverse impact on the competitiveness of firms as a result of the adoption of many global regulatory reforms in a short period of time. It recommended that the reforms be phased in over a longer time frame.22

What this suggests is that the federal and provincial governments must balance the stability and reliability that come from a sound regulatory environment with the burden and unintended consequences of phasing in too many regulations too quickly or failing to streamline them to spur the competitiveness of the cluster. This is particularly important because of the size of the cluster and the relationships it has with other sectors, such as Information Technology (IT). Between 1996 and 2009, Canada’s largest banks spent $55.8 billion on information technology, mainly in Toronto. In addition, the IT cluster earns 16 percent of its revenue from financial and business services.23 As the adoption of technology continues to advance and services move online, financial institutions are increasingly concerned about providing the same quality of service online as offline, and IT firms are hired to provide these customer experience solutions. Therefore, reviewing the regulatory environment to ensure it effectively balances the need for financial system stability with business competitiveness is something regulators can undertake in collaboration with financial and other industry partners.


The IT cluster offers products and services that are integral to the operation of many businesses across the Toronto region. Although it employs 0.9 percent of the Toronto labour force, the cluster is the eleventh largest in the region (Exhibit 14). The cluster has developed over the course of several decades, stimulated by government research and development (R&D) policies and also public-private partnerships between Toronto’s renowned post-secondary institutions, firms, and government agencies. By continuing its rich history, the Toronto IT cluster can lead the development of strong companies and innovative technologies.
STRENGTHS

- **TORONTO’S POST-SECONDARY INSTITUTIONS** are great contributors to IT advancements
- **HISTORY OF PUBLIC-PRIVATE PARTNERSHIPS** led to the building of Canadian firms and commercialization of innovations
- **MANY GOVERNMENT GRANTS AND POLICIES** (e.g., Scientific Research & Experimental Development tax credit) encourage IT innovation
- **HIGHER R&D INVESTED** per worker in IT than in other leading Canadian firms

CHALLENGES

- **SMALL SIZE OF BUSINESSES** makes it hard for firms to meet the needs of larger clients in other clusters
- **GENERAL RELUCTANCE OF CLIENTS** outside of the cluster to invest in IT, especially software
- **TRADITIONAL VENTURE CAPITAL MARKET** is insufficient in finding funding for R&D projects

AREAS FOR CONSIDERATION

- **WAYS OF BUILDING** on unique growth opportunities for all business sizes from SMEs to large firms
- **UPTAKE** of new Canadian software applications
- **OPPORTUNITIES** with senior levels of government to create tax credit for software investment
- **CLUSTER BASED STRATEGIES** (e.g., joint workforce development and capital investments) to spur innovation
- **COLLABORATION** with private and public sector funding bodies on ways to expand access to capital
The IT cluster in the Toronto region is made up of hardware and software sub-clusters of Computers, Electronic Components and Assemblies, Peripherals, Fiber Optic Cable, and Software, and supported by Communications Services.

The IT cluster in the Toronto CMA is relatively small compared to other clusters, such as Financial Services. Over 25,600 people work in the sector, yet employment in each sub-cluster has decreased since 2001 because greater computing power can automate tasks. The majority of workers are employed in the Communications Services sub-cluster (45 percent), with the fewest in Fiber Optic Cable.

The relatively small size of Toronto’s IT cluster is evident when comparing its total employment to that of the peer regions (Exhibit 15). Seattle has the largest IT cluster by employment and is the most concentrated, with an LQ of 4.2. These advantages generated the highest wages among all peer cities, of $196,200 in 2010. This is more than five times the IT wages in Toronto.

**TORONTO’S IT CLUSTER ORIGINS FROM STRONG PUBLIC-PRIVATE PARTNERSHIPS**

The IT cluster benefits from Canadian government programs, such as the Scientific Research & Experimental Development (SR&ED) grant, as well as the concentration of post-secondary research institutions. Universities are excellent breeding grounds for new ideas and research and can lead to commercialization of goods and services if partnered with the private sector. These institutions also provide companies with skilled labour and, with the growth of co-op programs, a future career path can be solidified early in a student’s career.

**AREAS FOR CONSIDERATION**

Ways of building on unique growth opportunities for all business sizes from SMEs to large firms. The relatively small size of the IT cluster in Toronto is not necessarily an issue if firms are productive. However, research has shown that the size of business is often a leading contributor to the amount of revenue and profit generated. Unfortunately, 47.7 percent of the firms in the Toronto region that specialize in IT have fewer than five employees. In fact, 95 percent of all IT firms have fewer than a hundred employees, and there are no IT businesses with more than 4,000 employees in any one firm.

There are abundant opportunities for growth for IT companies in both profit and employment, especially in light of the shift toward digitization and the adoption of technology among whole industries such as the creative and entertainment sector, and Financial Services. (See sidebar *The Toronto region’s digital media and creative industries offer emerging opportunities for IT growth.*) IT firms should build on the strength of the Toronto region’s IT cluster and capitalize on these opportunities.

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**Exhibit 15: IT cluster is larger in Toronto than in Canadian peer regions, but lower than in the United States**

<table>
<thead>
<tr>
<th>Location quotient</th>
<th>Total regional employment 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
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<tr>
<td>1</td>
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<td>6</td>
<td>60,000</td>
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<tr>
<td></td>
<td>70,000</td>
</tr>
</tbody>
</table>

Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada, Canadian Business Patterns, and the research of Michael E. Porter and the Cluster Mapping Project.

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Higher uptake of new Canadian software applications. Research has shown that Canadian business investment in software is lower than that of the United States. While there is no definitive solution, the reasoning may lie with both purchasing firms and software companies. Many Canadian companies are reluctant to purchase software unless it has been tested and tried in the United States. Many software firms must export their products to the United States first before being adopted by Canadian businesses. Unfortunately, this delays any implementation of software and by the time a Canadian company is ready to adopt a new piece of software, it may already be a few versions behind or specifications and requirements may have changed.

With a host of new technology options for firms to choose from, including cloud computing, mobile devices, and tablets, businesses could improve their productivity and growth by adopting these technologies.

Opportunities with senior levels of government to create tax credit for software investment. The Institute has in the past recommended that Canadian businesses use their growth cash reserves to invest in software. To help them, the provincial government should offer a tax credit to companies that purchase software, not only to close the gap with the US in this area, but also to reap the benefits of increased efficiencies from better tools, leading to business growth and profits. This tax credit should be time sensitive, so that companies can only lower their tax burden if they expense the purchase within the fiscal year. The introduction of this tax credit will help software firms scale up their operations with increased revenue.

The Toronto Region’s Digital Media and Creative Industries

As the creative and entertainment industries continue to become more technologically advanced and use technology such as social media to engage consumers, businesses should tap into the region’s IT sector to source solutions that will enhance its competitiveness.

Toronto has a tremendous competitive advantage in range and depth of its creative industries. Toronto is the Canadian headquarters for publishing, broadcasting, and music recording. It is the site of one of the world’s largest international film festivals, the largest media production centre, and a growing games development capability. Toronto has excellent educational facilities including an extensive college network offering cutting edge programs in arts and design, and elite development institutions like the Canadian Film Centre. Additionally, Ryerson University’s Digital Media Zone is a leading hub for digital media innovation and acts as an incubator for the development of, among other things, IT solutions to meet the needs of the creative and entertainment industries.

Despite many competitive challenges and the disruptive effects of digital technologies, which are upending sectors like retail and television and film production, Toronto’s entertainment and creative cluster has evolved to become more competitive in terms of its cluster composition. The cluster grew by 7.5 percent in employment between 2006 and 2011 – faster than the regional employment growth overall. The creative sectors are led by entrepreneurs and innovators and employ more than 50,000 people in the Toronto region, who develop valuable intellectual property for global markets. These industries have proven potential for development.

A great deal of Toronto’s strength in entertainment and creative industries arises from its ability to leverage and adapt to digital technologies. Interactive digital media (IDM) is the fastest growing segment of creative industries, as the rise of entirely new forms of content has generated opportunities in consumer-generated media, massively multi-player online games, visual effects, social media, apps, and many others. New platforms are expected to generate the majority of future growth within the sector.

As the move toward digitization continues, Toronto’s entertainment and creative cluster will see new opportunities for greater partnerships with the region’s IT sector which can capitalize on the huge potential of these new platforms. Working together can strengthen both of these important clusters and help create high value goods and technologies that can be exported from the region all over the world.

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25 Task Force for Competitiveness, Productivity and Economic Progress, Twelfth Annual Report, Course correction: Charting a new road map for Ontario, November 2013
26 Ibid
27 Institute for Competitiveness & Prosperity, White Paper, Bringing “dead cash” back to life, March 2013

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a. Entertainment and creative cluster classified as film and TV production, commercial production, animation and visual effects, book publishing, interactive digital media, magazine publishing, and music production; custom dataset provided by Nordicity.
Cluster based strategies (e.g., joint workforce development and capital investments) to spur innovation.

Innovation is at the heart of the IT cluster, because companies must keep “ahead of the curve” and stay abreast of any new technological changes and inventions. Of Canada’s top one hundred R&D spenders in 2012, fifteen were in the IT cluster. Taken together, the top IT companies spent $2.1 billion in 2012 on innovation, of which 84.9 percent was incurred by the nine firms with head offices in the Toronto region. Each IT employee working in Toronto contributed nearly $28,800 worth of R&D in 2012, which is higher than the $22,400 contributed by IT firms in other Canadian cities. IT firms must continue to invest in R&D and patent their innovations to increase revenue and profit.

Collaborate with private and public sector funding bodies on ways to expand access to capital. While the federal government offers policies to spur R&D spending in many sectors including IT, securing financing is often difficult in the traditional venture capital market, which hinders small companies’ ability to expand. The rise of crowd funding, however, has helped many technology companies launch successful products and services.

AngelList matches venture capital “angels” with companies seeking capital. Angels are high-value investors who have experience in a particular field and want to participate in start-ups financially and sometimes in operations directly. In Toronto currently, 978 are listed companies, with 2,933 investors, and 11,083 followers or investors with smaller amounts of capital who follow a lead or angel into an agreement to fund a company. The majority of these firms are in IT, and the average valuation is $3.3 million. IT firms must continue to use traditional and alternative methods of venture capital to fund their innovations and grow their businesses.

28 Analysis based on data from Re$earch Infosource, Canada’s Innovation Leaders 2013, November 8, 2013; Industry Canada, Canadian Company Capabilities.

TORONTO’S PROCESSED FOOD CLUSTER HOLDS PROMISING OPPORTUNITIES

Food and beverage processing is an important sector for the Toronto region economy. With nearly 1,000 food and beverage manufacturing establishments, the largest food terminal in the country (and third largest in North America), as well as access to a customer base of over 120 million in both Canada and the United States, Toronto’s food and beverage sector holds promising opportunities for the region (Exhibit 16).

Processed Food Cluster

Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada.
Map by Zara Matheson, Martin Prosperity Institute.
Exhibit 16: Processed Food has several sub-clusters

Processed Food cluster employment by sub-cluster, Toronto CMA, 2012

- **Baked Packaged Foods** 27.6%
- **Specialty Foods and Ingredients (incl. flour)** 20.8%
- **Containers (paper, metal and glass)** 16.9%
- **Meat and Related Products and Services** 15.7%
- **Candy and Chocolate** 8.6%
- **Processed Dairy Products (incl. milk & frozen desserts)** 4.8%
- **Beverages (milk, coffee & tea)** 4.5%
- **Food Products Machinery and Milling** 1.0%

**33,900 EMPLOYEES 1.2% OF THE TORONTO WORKFORCE**

Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada, Canadian Business Patterns.

**STRENGTHS**

- **THIRD LARGEST CLUSTER** by employment among North American peers
- **MOST CONCENTRATED CLUSTER** among North American peers, lowering shipping costs of processed food and distribution centres
- **SPECIALTY FOODS AND INGREDIENTS** sub-cluster experienced greater employment growth between 2001 and 2012 than the region overall, enabled by Toronto’s diverse population

**CHALLENGES**

- **LOW PRODUCTIVITY** because of lack of scale and low investment in machinery and equipment
- **FALL IN EMPLOYMENT GROWTH** over the past decade, as labour costs and global competition rose
- **DECREASE IN EXPORTS**, especially to the United States, contributing to the agri-food trade deficit

**AREAS FOR CONSIDERATION**

- **OPPORTUNITIES** in markets abroad
- **INVESTMENT** in machinery and equipment to improve productivity
- **POTENTIAL** for increased scale to boost employment and sales
- **WAYS OF ENCOURAGING** up-skilling of workers to grow the Processed Food cluster
Higher Scale and More Investment are Challenges for the Processed Food Cluster

The Processed Food cluster is Toronto’s eighth largest source of employment in the traded clusters and ranks third out of the peer city regions in total employment, at nearly 34,000 in 2012.30 Toronto has the largest location quotient in Processed Food out of all the peer regions, reflecting the industry’s importance to the regional economy (Exhibit 17). This finding presents formidable opportunities, but also challenges for the region.

While Toronto maintains a large presence in Processed Food relative to its peers, overall employment in the cluster declined by 18.6 percent between 2001 and 2012 (Exhibit 18). Like other manufacturing sectors, Processed Food faces challenges of rising input costs and increased competition from both North American and overseas markets. Production has continued to shift toward capital-rather than labour-intensive methods, reducing the demand for labour in the sector. Across Ontario, total costs for food and beverage manufacturers increased by more than 15 percent between 2004 and 2011, while revenue only increased by 8 percent, according to data from the Ontario Ministry of Agriculture and Food. However, Toronto is still one of the lowest cost jurisdictions for food processing compared with other North American regions. 11

Toronto’s competitive advantage in Processed Food is fast proving to be Specialty Foods and Ingredients, which includes “ethnic foods, foods that are produced in compliance with religious dietary laws, specialty diets, and gourmet and artisan products.”32 One of the largest sub-clusters in the region, it experienced a higher employment growth rate between 2001 and 2012 than Toronto overall, at 22.5 percent. This sector is boosted by Toronto’s multi-ethnic population, demanding a diverse range of specialty products and connecting Toronto to various international markets. Roughly one-quarter of Toronto’s food processing plants are considered to be making specialty products, and the demand for specialty foods has grown twice as fast as for products for the cluster overall.33

Toronto’s Processed Food cluster plays a valuable role in the regional economy. However, moving forward, the cluster should consider ways of adapting to the challenges of modern manufacturing to remain competitive. By capitalizing on its strengths in specialty foods and enhancing export opportunities, Processed Food can become a significant source of employment and GDP growth for Toronto.

30 Food and beverage processing falls under several of Michael Porter’s clusters in traded, local, and natural resource sectors, but Processed Food most accurately describes its activities. It should be noted that, combined with Food Products Wholesaling and Local Food and Beverage Processing and Distribution, this figure increases to over 125,000; however for the purpose of this study, it is more useful to focus on the traded clusters, as these are the most critical for Toronto’s economic potential.


**AREAS FOR CONSIDERATION**

**Opportunities in markets abroad.**

One of Toronto’s best assets in Processed Food is its proximity to the United States. Roughly three-quarters of Ontario’s agri-food exports (which includes agricultural goods as well as food and beverage manufacturing) go to American markets. However, between 2002 and 2012, agri-food exports to the United States from the province declined by 9.1 percent in real terms. This has contributed to an overall increase of nearly $4 billion in real terms in Ontario’s agri-food trade deficit.\(^{34}\) While these figures are not specific to Toronto’s Processed Food cluster, they speak to the clear trend away from traditional US markets in food-based industries.

Conversely, agri-food exports from the province to markets in Asia (especially China), the European Union, Latin America, and Mexico doubled in real terms since 2002. This trade shift is likely to continue as emerging markets dominate global economic growth.

Toronto has proven potential in specialty foods that draw on both Toronto’s unique, high-quality foods, as well as the diverse range of products demanded by its multicultural population. This provides tremendous opportunity for the region to develop niche products that can be marketed at home and abroad.

To accelerate the industry’s growth, Toronto food processors could explore ways of increasing their presence in global markets and incorporating local and international food trends into their business strategies. Business organizations and government can help this cluster rise to these challenges through effective collaborations in areas like export promotion and trade development.

**Investment in machinery and equipment to improve productivity.** Like other manufacturing sectors, food processing has suffered from lagging labour productivity over the past decade. While data are unavailable at the regional level for productivity and manufacturing value added, Ontario-wide data provide a good proxy for Toronto, as more than half of food and beverage processing in the province takes place within the region.\(^{35}\)

Data from the Ontario Ministry of Agriculture and Food show that food processing labour productivity remained stagnant between 2002 and 2010 in real terms, and GDP declined by 1.3 percent in real terms.\(^{36}\) In addition, manufacturing value added from the food and beverage sector as a proportion of GDP is below that of many of Ontario’s top US manufacturing competitor regions, such as Illinois, Ohio, and Michigan.\(^{37}\)

Toronto food and beverage manufacturers could improve their productivity by investing in machinery and equipment. Machinery in food processing in Ontario is older than that in many other industries, and investment in machinery and equipment has consistently been lower for food manufacturing than for other manufacturing sectors as well as

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\(^{34}\) Task Force on Competitiveness, Productivity and Economic Progress, Twelfth Annual Report, Course correction: Charting a new road map for Ontario, November 2013.

\(^{35}\) InvestToronto, Food and Beverage Sector, 2012.


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**Exhibit 18: Toronto’s Processed Food cluster overall has declined but specialty foods is growing**

<table>
<thead>
<tr>
<th>Specialty foods and ingredients</th>
<th>Coffee and tea</th>
<th>Baked packaged foods</th>
<th>Food products machinery</th>
<th>Processed dairy and related products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processed food total</td>
<td>Paper containers and boxes</td>
<td>Candy and chocolate</td>
<td>Flour</td>
<td>Malt beverages</td>
</tr>
<tr>
<td>Meat and related products and services</td>
<td>Metal and glass containers</td>
<td>Milk and frozen desserts</td>
<td>Milling</td>
<td></td>
</tr>
<tr>
<td>Source: Institute for Competitiveness &amp; Prosperity analysis based on data from Statistics Canada, Canadian Business Patterns.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
for per employee investment in the United States over the past two decades.\textsuperscript{38} As manufacturing becomes more oriented toward high value-add, technologically-intensive production, it makes sense for food processors to adapt their equipment.

**Potential for increased scale to boost employment and sales.**

Another impediment to Processed Food’s productivity is the lack of scale in the region’s businesses. Approximately one-quarter of Toronto’s food processors have sales between $5 and $50 million, and more than 80 percent employ fewer than fifty people.\textsuperscript{39} Canadian food processing facilities have on average half the number of employees and less than half the sales revenue of US facilities.\textsuperscript{40}

This hurts the industry’s competitiveness, as manufacturing value add is significantly higher for larger firms. Value added per employee in the largest quartile of food processing firms is more than double that of the median in Canada.\textsuperscript{41} While increasing scale is inevitably a challenge for all firms, specific attention toward Toronto’s Processed Food cluster is warranted. The Board has noted that the region’s small food processors have high potential for growth, but investments are needed to scale up operations and enhance productivity. Without these tools for expansion, Toronto’s food and beverage sector is at risk of stagnating.

**Ways of encouraging up-skilling of workers to grow the Processed Food cluster.** As food and beverage manufacturing has become more technologically advanced and more complex as a business, the need for skilled labour has increased. The Ontario Agricultural College study on agri-food employment showed that 60 percent of firms in their sample of food-processing and other agri-food firms claimed they had a preference for formal training in agriculture and food.\textsuperscript{42} Various colleges and universities across the province have responded to this demand by creating specialized agriculture and food and beverage processing programs. There are currently fifty post-secondary courses and programs across Ontario in the areas of agriculture, food science, nutritional science, and culinary arts. Ontario also plans to create a food processor apprenticeship program.\textsuperscript{43}

Nonetheless, establishing a larger network of post-secondary institutions geared toward food and beverage processing could yield even more benefits for the sector in Toronto. Manufacturers need to be educated on the latest innovations and trends in production, as well as business skills required to set up effective marketing strategies and e-commerce.\textsuperscript{44} This type of comprehensive training is best disseminated through formal education and effective on-the-job training.

In this sense, there are good opportunities for post-secondary institutions in Toronto and Ontario to tap into locally competitive and growing agri-food industries. Niagara College, for example, has done this with the Winery and Viticulture Technician Program, established in 2000. With the use of a “teaching winery,” students get hands-on experience in winemaking as well as sales and marketing in Ontario’s famed and growing Niagara region (exports of VQA wines grew by 30 percent in the past decade and now go to more than twenty countries worldwide).\textsuperscript{45} The college now offers a program in wine business management – the first of its kind in Canada – that specializes in business, hospitality and tourism training for the wine industry.\textsuperscript{46} Similar programs can be set up for the manufacturing, processing, and distribution of specialty foods, a sector with great potential across the region.

Education is a critical part of increasing Toronto’s overall skilled labour force. To ensure Processed Food businesses secure the right people to help develop and grow these industries, specialized and localized educational facilities can play a big role in honing new talent for the industry. With these tools for innovation and productive labour in place, these industries will be better placed to reach their full growth potential.

\textsuperscript{38} George Morris Centre and Institute for Competitiveness & Prosperity, Improving Productivity in Canada’s Food Processing Sector through Greater Scale, February 2012.
\textsuperscript{39} City of Toronto, Key Industry Sectors, “Food & Beverage,” 2012; Toronto Board of Trade, Business takes the lead: Collaborate to compete, Toronto Region Economic Summit Report, 2012.
\textsuperscript{40} George Morris Centre and Institute for Competitiveness & Prosperity, Improving Productivity in Canada’s Food Processing Sector through Greater Scale.
\textsuperscript{41} Ibid.
\textsuperscript{42} JRG Consulting Group, Planning for Tomorrow for OAC: Input from Industry, Ontario Agricultural College, University of Guelph, February 2012.
\textsuperscript{43} MNP LLP, Economic Impact Study Report: Ontario Food and Beverage Processing Sector, Alliance of Ontario Food Processors, September 2012.
\textsuperscript{44} Harry Cummings, Ontario’s Agriculture and Rural Economy: Today and Tomorrow? A Qualitative and Quantitative Perspective, Agriculture Canada, April 2005.
\textsuperscript{46} NC Teaching Winery, History, 2013.
Toronto’s third-largest traded cluster by employment size is Education and Knowledge Creation, comprising colleges, universities, think tanks, select consultancies, and other research organizations (Exhibit 19). This cluster is immensely important for driving innovation and productivity, as it both generates and attracts highly skilled labour to the region. It also acts as a hub for entrepreneurs and inventors.
Exhibit 19: Educational institutions is the largest sub-cluster in Education and Knowledge Creation

Education and Knowledge Creation cluster employment by sub-cluster, Toronto CMA, 2012

- Educational Institutions 63.1%
- Research Organizations 25.8%
- Educational Facilities 6.9%
- Lessors of Other Non-Financial Intangible Assets 4.1%

76,300 EMPLOYEES
2.7% OF THE TORONTO WORKFORCE

Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada, Canadian Business Patterns.

STRENGTHS

- **EMPLOYMENT GROWTH** is second highest among all traded clusters in Toronto
- **REPUTATION** of the region’s educational institutions and research institutes will continue to drive enrollment
- **STRONG AND GROWING** entrepreneurship programs
- **UNIQUE COLLABORATIONS** and partnerships between colleges and universities

CHALLENGES

- **INCREASING AND DIVERSIFYING** research funding to boost innovation and commercialization
- **MISMATCH OF REQUIRED WORKPLACE SKILLS** and those acquired from education, limiting productivity growth from skills developed

AREAS FOR CONSIDERATION

- **OPPORTUNITIES** to capitalize on introduction of innovation vouchers to bridge Toronto’s business and academic communities
- **CREATION OF A HIGHER EDUCATION** advocacy group for Toronto
- **EXCELLENCE** of Toronto’s college network
Toronto’s large and growing employment in Education and Knowledge Creation (it had the second highest employment growth out of Toronto’s traded clusters) is relatively less concentrated within the region compared to the North American peers (Exhibit 20). Toronto employs just over 76,000 in Education and Knowledge Creation, while Boston employs nearly 180,000 and New York roughly 300,000.

Toronto also has the third-lowest location quotient out of the North American peer regions, indicating that its regional presence in Education and Knowledge Creation is less significant compared to the national level than the other regions. More specifically, its location quotient of 0.9 indicates that Toronto has a lower concentration of employment in Education and Knowledge Creation than Canada overall, which is indicative of the sprawl of post-secondary institutions across the country.

It is expected that this sector will continue to increase, given the rising enrollment in universities and colleges. There are several ways this sector can be enhanced to heighten Toronto’s prosperity and skilled labour supply. Toronto’s Education and Knowledge Creation cluster is a major driver of the region’s human capital assets, but should capitalize and improve on this.

**AREAS FOR CONSIDERATION**

*Opportunities to capitalize on introduction of innovation vouchers to bridge Toronto’s business and academic communities.* The Government of Ontario announced in 2013 that it would create a pilot Commercialization and Innovation Voucher program to incentivize businesses to form partnerships with research institutions, which will in turn increase innovation and commercialization activity for both sectors. The program seeks to create a “marketplace” for entrepreneurs and small and medium businesses to access innovation, productivity, and commercialization services offered by research institutions. It will also aim to enrich post-secondary institutions with experiential learning opportunities for students. The program will feature a combination of financial and organizational resources to help form partnerships.

This program could offer an avenue to spur companies – particularly small- and medium-sized businesses that are less likely to innovate – to increase their innovation activity by accessing innovation supports in the province’s colleges, polytechnics and universities. According to the Association of University Technology Managers’ (AUTM’s) *Canadian Licensing Survey*, just 12 percent of research funding for Canadian institutions came from industrial sources in 2012. Meanwhile, 44.1 percent of research funding came from the federal government. Toronto universities and research centres are also ranked significantly lower in overall, which is indicative of the sprawl of post-secondary institutions across the country.

This program could offer an avenue to spur companies – particularly small- and medium-sized businesses that are less likely to innovate – to increase their innovation activity by accessing innovation supports in the province’s colleges, polytechnics and universities. According to the Association of University Technology Managers’ (AUTM’s) *Canadian Licensing Survey*, just 12 percent of research funding for Canadian institutions came from industrial sources in 2012. Meanwhile, 44.1 percent of research funding came from the federal government. Toronto universities and research centres are also ranked significantly lower in

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research expenditure than academic and research institutions in peer jurisdictions, especially those found in the US, with the average 2012 research expenditure for Toronto institutions barely a third of the average for those found in other peer jurisdictions.48

The current system is marked by many “push” policies to promote R&D investment and innovation by stimulating commercialization from the higher education sector. But to create a more effective and commercially successful innovation ecosystem, greater “pull” is needed from businesses to seek out innovation expertise from post-secondary institutions. Toronto businesses could therefore take advantage of the additional incentive created by the innovation voucher program to conduct R&D and other innovation activity. By combining the research capacity of Toronto’s academic community with capital from the business community, this partnership has the potential to generate new opportunities for growth in the Education and Knowledge Creation cluster and create spillover effects for the entire region.

Creation of a higher education advocacy group for Toronto. Post-secondary institutions in Toronto might benefit from having a greater voice in public policy represented by one unified body. For example, London, UK universities and colleges have partnered together to create such an organization entitled “London Higher.” Representing over forty publicly funded universities and colleges in London, it advocates for the sector on issues such as research, access to higher education, and attracting international students. It conducts workshops, meets with policymakers, and researches the sector’s performance.

Valuable work in this field has already been conducted by the Canadian Council of Colleges and the Canadian Council of Universities. However, a more regionally-focused organization could address common needs and issues facing institutions across the region, thereby creating the potential for more targeted policies.

Initiatives to build on excellence in Toronto’s college network. The strength of Toronto’s Education and Knowledge Creation cluster is owed in large part to the combined power of its university and college networks. While the former provides the foundation for high profile academic research and innovation, the latter provides the core training ground for many key industries within the region. Colleges and polytechnics offer applied learning and have a more flexible approach toward curricula development. Many colleges also now offer undergraduate degrees, including four-year BA degrees, creating vast opportunities for growth and export within the Education and Knowledge Creation cluster. The strength of Toronto and Canada’s college sector in particular significantly boosts post-secondary education completion rates, with more than half of Torontonians completing some form of post-secondary education and a quarter having completed a college diploma, certificate, or apprenticeship.49

Colleges are also active in supporting applied research activities in partnership with local industries, in addition to working with Ontario’s universities to get new products and services to market. Federal and provincial government policy over the past decade has taken steps to fund college applied research activity in partnership with firms. Firms are able to access human and technical resources in support of new product and service development, with funding support from various levels of government. This has the effect of increasing the capacity of industry to innovate and invest in R&D, while giving students key innovation skills, as industry applied research projects are generally conducted in concert with curricula.

Many degree programs offered at Toronto institutions are realizing the advantages of combining the academic core skills offered through universities with the hands-on, job-specific training offered by colleges. Combined diploma and degree programs are becoming increasingly popular in a diverse range of fields, with partnerships between Seneca College and York University and the University of Guelph and Humber College, among others. These unique hybrid programs should be encouraged and expanded. The Ontario government recently created an online database aimed at facilitating credit transfers between post-secondary institutions. This is a good step toward blending the university and college sectors in the region and it is hoped that, with greater mobility, students will be able to take advantage of the types of learning offered by both sectors. Developing a more unified education system will aid human capital development and innovation capacity to build a resilient regional economy.

The Life Sciences sector in Toronto is world-renowned for its medical professionals and schools. Many large pharmaceutical companies have their Canadian headquarters in the region, attracting talent and investment. The Life Sciences sector comprises two clusters, Biopharmaceuticals and Medical Devices, which combined employ a greater share of workers in Toronto than in most North American peer city regions (Exhibit 21). The Biopharmaceuticals cluster in Toronto accounts for nearly 40 percent of the national cluster employment, while Medical Devices in Toronto represents 26.9 percent of the national cluster employment. They are critical parts of Toronto’s health care system and a key to provincial and national social and economic policy.
**Strengths**

- **THE LARGEST MEDICAL SCHOOL** in North America is at the University of Toronto
- **MANY WORLD CLASS** research hospitals are located in the region
- **SUBSTANTIAL FUNDING** from government programs through R&D tax credits, the Ontario Tax Exemption for Commercialization (OTEC), and the Ontario Research Fund (ORF)
- **SPECIALIZED SCIENTIFIC INFRASTRUCTURE** conducting pioneering research
- **RIVALRY AMONG MANY SMALL FIRMS** alongside global giants such as AstraZeneca, Bayer, Eli Lilly, and Johnson & Johnson

**Challenges**

- **SMALL EMPLOYMENT SIZE** spread across the region
- **LACK OF SOPHISTICATED CUSTOMERS** hamper innovation and productivity
- **LOW LEVELS OF ENTREPRENEURSHIP** in Life Sciences threaten long-term competitiveness

**Areas for Consideration**

- **WAYS OF ENHANCING** customer sophistication by drawing on government programs in disease management
- **OPPORTUNITIES** to improve collaboration between scientists and entrepreneurs

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**Exhibit 21: Life Sciences sector is most concentrated in the Toronto region**

*Life Sciences sector by cluster and sub-cluster employment, Toronto CMA, 2012*

- **Biopharmaceuticals**: 58.7% of total cluster employment
- **Medical Devices**: 41.3% of total cluster employment

**Containers**: 19.6%
**Health and Beauty**: 22.0%
**Biopharmaceuticals**: 58.4%

**Surgical Instruments and Supplies**: 40.4%
**Medical Equipment**: 20.7%
**Biological Products**: 19.0%
**Diagnostic Substances**: 12.5%
**Ophthalmic Goods**: 4.4%
**Dental Instruments and Supplies**: 3.0%

**Medical Devices**

- **Surgical Instruments and Supplies**: 40.4%
- **Medical Equipment**: 20.7%
- **Biological Products**: 19.0%
- **Diagnostic Substances**: 12.5%
- **Ophthalmic Goods**: 4.4%
- **Dental Instruments and Supplies**: 3.0%

**Biopharmaceuticals**

- **Containers**: 19.6%
- **Health and Beauty**: 22.0%
- **Biopharmaceuticals**: 58.4%

**16,700 EMPLOYEES**
**0.6% OF THE TORONTO WORKFORCE**

Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada, Canadian Business Patterns.
Toronto has a century long history in the Life Sciences sector. Established in the early 1910s when Dr. John Gerald FitzGerald developed a diphtheria antitoxin at the University of Toronto, Toronto has since achieved many ground-breaking innovations and medical discoveries, including the discovery of insulin, the first pacemaker, the first stem cell, and most recently the Viral-free iPS cell in 2009. Along this trajectory, Toronto’s Life Sciences sector has developed a rich base of specific resources required for cluster development, including a large number of medically trained professionals, the largest medical school in North America (University of Toronto), world-class research hospitals, substantial funding from governments and industry, and specialized scientific infrastructure conducting pioneering research. Though Toronto’s Life Sciences sector has encountered challenges in expanding, it represents a key opportunity for growth and high-tech job creation across the region.

**Life Sciences Sector is Highly Concentrated in Toronto**

Toronto’s Life Sciences sector is small but highly concentrated, employing a combined 16,700 workers in the Biopharmaceuticals and Medical Devices clusters. However, it achieved a location quotient greater than 1, with Biopharmaceuticals being the highest concentrated cluster among forty-one traded clusters at 2.17 versus 2.09 in the Financial Services cluster. Among its North American peer regions, Toronto’s Biopharmaceuticals cluster has the fifth largest employment size and third highest location quotient (Exhibit 22).

Toronto’s Medical Devices cluster is also relatively small but highly concentrated. The 2010 location quotient (LQ) for Toronto in Medical Devices is 1.3, following top performing Boston at 2.2, San Francisco at 1.9, Los Angeles at 1.6, and Montréal at 1.4 (Exhibit 23).

**Toronto’s Research Hospitals have Growing Research Income**

Toronto, as the leading CMA in the province, traditionally has had an advantage in Life Sciences research and development. In fiscal 2012, ten out of Canada’s top forty research hospitals as measured by research income were located in Toronto, receiving a total of $849 million. Three out of these ten research hospitals are listed in “The $100 Million Club,” which receive more than $100 million research income.

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** Exhibit 22: Toronto has a more highly concentrated Biopharmaceuticals cluster than the US peers**

Toronto CMA and North American peer regions, 2010

<table>
<thead>
<tr>
<th>Location quotient</th>
<th>Total regional employment 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>-5,000</td>
<td>5,000</td>
</tr>
<tr>
<td>-1</td>
<td>10,000</td>
</tr>
<tr>
<td>1</td>
<td>15,000</td>
</tr>
<tr>
<td>2</td>
<td>20,000</td>
</tr>
<tr>
<td>3</td>
<td>25,000</td>
</tr>
<tr>
<td>4</td>
<td>30,000</td>
</tr>
<tr>
<td>5</td>
<td>35,000</td>
</tr>
<tr>
<td>0</td>
<td>40,000</td>
</tr>
</tbody>
</table>

Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada, Canadian Business Patterns, and the research of Michael E. Porter and the Cluster Mapping Project.

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50 Many observers note that the Life Sciences sector has a broader definition that includes more industries than those specified here, including medicine manufacturing, health and beauty products, plastic containers for biopharmaceuticals purpose, medical equipment and supplies manufacturing, and pharmaceuticals. This report only analyzed the traded clusters falling within the Life Sciences sector as traded clusters are usually responsible for bringing more high paying jobs, more patent applications and trade surplus.

51 It is important to note that strong concentration only indicates a higher share of employment in the region against nation-wide employment in the industry. However, it usually implies greater accomplishment in talent attraction, specific infrastructure development, and research and development (R&D) level attributable to the density of the workforce in the region.
income individually. Toronto’s research institutions also attained a 9.3 percent increase in total research income growth, higher than the national level of 4.8 percent and provincial level of 6.1 percent.

Besides the scale and growth rate, Toronto also has an outstanding research intensity measured by the level of funding per researcher. Toronto has an average of $413.5 million per researcher versus the national level of $268.6 million per researcher. Toronto’s Mount Sinai Hospital, Joseph and Wolf Lebovic Health Complex ranked first in this regard, with $834.600 million per researcher, followed by Sunnybrook Health Sciences Centre (fifth place, $494,500 per researcher) and the University Health Network (seventh place, $439,400 per researcher).

However, a disconcerting trend is developing as pharmaceutical companies decrease their research expenditures, though government and private donors are working to fill the funding gap. This is partly attributed to the decline of the pharmaceutical sector in Canada and elsewhere, which requires attention.

**TORONTO’S LIFE SCIENCES SECTOR COULD EXPORT ITS EFFORTS IN COMMERCIALIZATION**

The Life Sciences sector is in many ways a missed opportunity for Toronto. Surrounded by a group of growing support industries such as Information Technology, Education and Knowledge Creation, and advanced manufacturing, Life Sciences has achieved a great deal of innovation in academe. In spite of its strengths, however, lack of commercialization was the major bottleneck for it to achieve a higher level of success. In 2005, a group of academic institutions established MaRS Innovation to tackle the conundrum of Toronto’s poor commercialization record, despite its $1 billion in annual science and technology research spending. Since its founding, MaRS Innovation has created many unique initiatives that build on cross-partnerships with industry, government, and academic stakeholders. For example, Excellence in Clinical Innovation and Technology Evaluation helps to collect effective pre-market evidence and test premature medical technologies. Another example is JOLT, a health-related start-up accelerator for high-growth web and mobile companies, which assists participating start-ups in bringing products and services to market, securing financing, and scaling their businesses.

With a high concentration of skilled labour, nearly $1 billion in annual research spending, and well-established general and specific infrastructure, Toronto’s Life Sciences sector is primed for substantial development. Yet despite the momentum and strength it has gained already, it still faces several challenges to scale up and compete internationally.

**AREAS FOR CONSIDERATION**

Ways to capitalize on enhancing customer sophistication by drawing on government programs in disease management. One major challenge that has prevented innovation in the Life Sciences sector is the lack of sophisticated customers. The

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single procurement mechanism can hamper the incentive for innovation to compete globally because of the buyer’s bargaining power.\(^5^3\) To drive growth in the sector, federal and provincial governments could shift their emphasis on procurement from cost control to value generation.\(^5^4\)

In lieu of changing the health care procurement process completely, an incremental way of improving the sophistication of government’s purchasing would draw on government programs in disease management. Governments could explore ways of committing to innovation and commercialization to tackle broad health issues.

Ways to address this challenge could be threefold. At the federal level, government could focus on a list of diseases to control and cure within a particular time frame, and then encourage research achievements through government funding or other financial incentives. The provincial government could facilitate academic institutions or industry leaders to meet research targets by attracting global talent to the region, providing a health care research and innovation fund, and marketing the cluster’s success story. Finally, businesses could participate and support federal government initiatives and lead and manage cluster initiatives, such as scientist-entrepreneur partnerships or online-based cluster knowledge sharing tools.

### Opportunities to improve collaboration between scientists and entrepreneurs

The collaboration gap between researchers and entrepreneurs in the Life Sciences field has long been observed. Researchers often do not have the business skills to translate their ideas and inventions into commercial successes, while entrepreneurs often lack insights into what is happening in scientific fields.

At the provincial and regional levels, a number of initiatives could be leveraged to address this challenge. MaRS Innovation is a regional leader in coordinating health-related intellectual property from hospitals, the Ontario Institute for Cancer Research (OICR), University of Toronto, and other institutions. The Government of Ontario has also formed a Life Sciences partnership council as part of its 2010 Life Sciences Commercialization Strategy. This advisory group consists of representatives from industry, government, and academia and aims to facilitate the flow of information and skilled workers within the sector.\(^5^5\)

At the regional level, young entrepreneurs are key assets to Toronto’s long-term competitiveness and the Toronto region has excellent organizations such as MaRS which help start-ups in the Life Sciences sector gain access to capital and business management expertise. Nonetheless, a lack of global exposure has made Toronto-based Life Sciences start-up incubators less visible than those found in the United States. Thus, government and private sector partners could work together to enhance the global visibility of existing Life Sciences start-ups and incubators, thereby attracting and retaining more entrepreneurial talent and investment in the region.

### Strong clusters are the first building block toward improving Toronto’s regional economic performance

The five clusters analyzed in this report are among several in the Toronto region that hold potential for leading growth and inspiring change among businesses in other sectors. Toronto’s competitor regions benefit from a solid cluster environment through more innovation capacity, higher wages, and higher economic output. Toronto’s advantage lies in the diverse make up of its traded clusters, but these must be strengthened to boost Toronto’s overall economic performance.

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\(^{54}\) The Conference Board of Canada, Innovation Procurement in Health Care, A Compelling Opportunity for Canada, July 2011, p. 5.

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OTHER COMPETITIVENESS INITIATIVES

Toronto can improve its productivity through innovation.
Innovation is integral to boosting productivity. To achieve the economic vision for the Toronto region, small- and medium-sized enterprises within clusters should adopt an innovative mentality and develop initiatives to help their respective clusters grow.
**TORONTO UNDERPERFORMS IN KEY METRICS OF INNOVATION**

**INNOVATION IS THE LIFEblood** of productivity growth. For the Toronto region to meet its goal of achieving 10 percent productivity growth by 2025, business attitudes and activities surrounding innovation must intensify. Small and medium-sized enterprises must look to new processes, ideas, products, and services to stimulate growth. Businesses and governments must continue to invest to ensure that Toronto performs well on key innovative measures, including patent count, research and development (R&D) spending, and venture capital investment.

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**STRENGTHS**

- **STRONG EDUCATION AND KNOWLEDGE CREATION** cluster has led to significantly higher patenting and R&D from the university sector than peers

- **MANY RESOURCES FOR ENTREPRENEURS AND SMALL BUSINESSES** provide financial and personnel support to further innovation goals, including the MaRS Discovery District and the federal SR&ED program

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**CHALLENGES**

- **TORONTO PERFORMS BELOW ITS PEERS ON MOST MEASURES OF INNOVATION**, including patenting, R&D spending, and venture capital investment

- **MOTIVATION TO INNOVATE IS LOW AMONG SMALL AND MEDIUM ENTERPRISES (SMEs)**, which make up the vast majority of Toronto businesses

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**AREAS FOR CONSIDERATION**

- **IMPROVEMENTS IN MANAGEMENT EDUCATION** within SMEs

- **ENCOURAGEMENT OF SMES TO CREATE A PLAN FOR INTRODUCING AN INNOVATION WITHIN FIVE YEARS**

- **PARTNERING WITH CLUSTER ASSOCIATIONS AND TORONTO START-UP GROUPS** to implement new venture capital fund

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One innovation area in which Toronto struggles to match the performance of its US peers is in patent count. Comparing Toronto’s overall number of patent applications per 10,000 employees shows that Toronto is second last out of its North American peers, at a rate of 2.1. This compares with 30.3 for San Francisco and 13.7 for Boston, ranked first and second, respectively.

Toronto’s top ten patenting clusters are for the most part the perennial innovators in high-tech industries. Communications Equipment and Information Technology rank first and third, respectively, with average patent counts of over 100 per 10,000 employees (Exhibit 24). Analytical Instruments and Medical Devices also perform well, with patent counts of 57.6 and 36.4, respectively.

What is interesting, however, is the patenting performance of natural resource-oriented industries. The cluster with the second highest patent count per employee is Fertilizers, and also in the top ten is Oil and Gas Products and Services. This is unique to Toronto, as most of the US regions have much lower patent counts in these industries. Even Calgary on a per-employee basis produces only a tenth of the patents produced by the Oil and Gas cluster in Toronto. This is likely due to the significantly higher employment in Oil and Gas in Calgary and Toronto’s high concentration of Oil and Gas Service companies.

While high patent output in any cluster is a positive indicator of innovation activity in the region, for the Toronto region to surpass its US peers and move out of second last place in patent output, it must improve its performance in high value add traded clusters, such as IT, Analytical Instruments, and Medical Devices. These clusters are essential to building Toronto’s competitiveness, and patent

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56 See Appendix III for data on innovation metrics.
output plays a significant role in establishing the region as a centre for innovation and business activity in these core sectors and beyond.

**BUSINESS R&D EXPENDITURES ARE LOW**

In research and development (R&D), another key metric for innovation activity, data suggest Toronto performs slightly better and in some clusters, such as IT, R&D expenditures by large businesses are significant.

Using Ontario as a proxy for the region, as R&D expenditure data are only available at the provincial level, the province ranks at the median of North American peer provinces and states. Yet only 48 percent of Ontario’s R&D expenditure is conducted by businesses, compared to more than 65 percent for most peer states. The remaining 52 percent of the province’s R&D expenditure is generated by governments and higher education institutions.

Developing strong innovation and competitiveness initiatives will help Toronto – and the province – move beyond the median and into a leadership position among North American peers. Increasing innovation will improve productivity, which would contribute to the $6,800 of productivity needed to fulfill the economic vision.

**TORONTO REGION START-UPS REQUIRE VENTURE CAPITAL FUNDING**

Venture capital investment is another important facet of innovation activity in a region, as it represents investment in high-risk early stage or start-up companies. It is a major factor that enables entrepreneurs and new businesses to succeed and reflects a region’s ability to foster high-potential firms and a competitive environment. This is particularly important for young technology companies and other innovative firms that lack the cash flow and tangible assets to secure capital from a larger financial institution.

Toronto performs below the median of its peer group in venture capital investment as a proportion of its GDP. Taking the five-year average between 2009 and 2013, approximately $998 of venture capital was invested per $1 million of GDP. This is roughly one-eighth the level of San Francisco or Boston, ranked first and second, respectively. Vancouver and Montréal also have much higher levels of venture capital investment relative to their GDP.

Toronto needs to develop a stronger innovation ecosystem to spur more venture capital investment, patent output, and R&D activity among businesses. There are excellent resources in place to help start-ups and small businesses grow and capitalize on their innovations (See sidebar Businesses have many resources to become more innovative). Toronto should build on and expand these partnerships to position itself as a North American innovation hub.

**TORONTO NEEDS A SHIFT IN ATTITUDES TOWARD INNOVATION**

There is extensive research exploring the question of why Canadian innovation activity lags that of the United States. One qualitative study that examined the issue of innovation output at the Canadian regional level is the Survey on Financing and Growth of Small and Medium Enterprises conducted by Industry Canada. This survey identified what innovations companies with less than 500 employees have undertaken over the past three years and the results of their innovative activity. While the survey targets SMEs specifically rather than the entire economy, it is highly useful as more than 95 percent of Toronto businesses are classified as SMEs. In turn, it represents a segment

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**Exhibit 24: Toronto’s top patenting clusters are primarily in high-tech and natural resource industries**

<table>
<thead>
<tr>
<th>Toronto CMA, 2006-2010</th>
<th>Top 10 clusters by average patents per 10,000 employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications Equipment</td>
<td>123.9</td>
</tr>
<tr>
<td>Fertilizers</td>
<td>111.5</td>
</tr>
<tr>
<td>Information Technology</td>
<td>102.7</td>
</tr>
<tr>
<td>Sporting, Recreational and Children’s Goods</td>
<td>71.9</td>
</tr>
<tr>
<td>Analytical Instruments</td>
<td>57.6</td>
</tr>
<tr>
<td>Heavy Machinery</td>
<td>43.3</td>
</tr>
<tr>
<td>Motor Driven Products</td>
<td>40.2</td>
</tr>
<tr>
<td>Oil and Gas</td>
<td>37.8</td>
</tr>
<tr>
<td>Production Technology</td>
<td>37.2</td>
</tr>
<tr>
<td>Medical Devices</td>
<td>36.4</td>
</tr>
</tbody>
</table>


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57 North American peer provinces and states are defined by the associated provinces and states for the metros measured elsewhere in this report, which include Québec, British Columbia, Alberta, New York, Massachusetts, Illinois, Georgia, Texas, California, and Washington.
of the business sector that is both the vast majority of firms and a source of tremendous opportunity for the region.

The data point to some alarming attitudinal issues in the Toronto region. Just 40.4 percent of Toronto SMEs introduced at least one innovation in the form of a new or significantly improved good or service, production process or method, organizational method, or method of selling goods or services between the years 2009 and 2011. Although this figure is the second highest of the CMAs surveyed (Vancouver is the highest at 41.7 percent), this provides reasonable evidence that the majority of businesses across the region are not innovating.

The survey also provides data on reasons why organizations chose not to innovate over the period. The results are troubling. In Toronto, 8.5 percent of businesses indicated that they had carried out innovations prior to 2009, 30.6 percent indicated that their market “doesn’t require new products/processes,” and a surprising 40.4 percent indicated that their business “doesn’t need to innovate/innovation is not part of the business plan.”

These findings are puzzling considering the potential benefits of innovation to businesses themselves. More than 67 percent of the Toronto SMEs surveyed that had introduced an innovation claimed they saw increased sales, and 54 percent claimed they captured a greater market share. Only 8.8 percent claimed they saw no result, and 37.8 percent claimed that results had not yet been realized.

The survey shows similar results for intellectual property. Only 21.4 percent of businesses held at least one type of intellectual property, including registered trademarks, patents, registered industrial designs, or trade secrets. Of those that held no intellectual property, 90.1 percent cited their reason as “no need/not relevant for the business.”

This apathy toward innovation among SMEs needs to be overcome. Instead, SMEs should use innovation as the means to growth, as it is large firms that contribute disproportionately to

Businesses have many resources to become more innovative

R&D and commercialization are often expensive, time-consuming processes, and businesses often lack the physical space and capital to undertake these important activities. Toronto has formed a well-established network of non-profit organizations and government programs to address this, particularly in areas of innovation.

MARS DISCOVERY DISTRICT
MaRS is a non-profit innovation centre that connects entrepreneurs with business skills, networks, and capital to accelerate the creation and growth of enterprises and capitalize on innovation. It is well-connected to Canada’s largest teaching hospitals, the University of Toronto, and more than two dozen affiliated research institutes. In addition to providing access to funds through the Ministry of Research and Innovation and contacts in angel networks and venture capital funds, MaRS also offers a range of advisory services and market research capabilities. It remains at the forefront of entrepreneurship and innovation in the region.

SCIENTIFIC RESEARCH AND EXPERIMENTAL DEVELOPMENT PROGRAM (SR&ED)
The federally-funded SR&ED program is highly utilized by R&D intensive firms across Canada. Eligible businesses can earn a refundable tax credit worth up to 35 percent of R&D expenditures, along with additional credits for hiring eligible R&D employees. These generous incentives make Canada one of the most amenable countries for conducting R&D.

ONTARIO CENTRES OF EXCELLENCE (OCE)
OCE is a provincially-funded non-profit that facilitates innovation commercialization from Ontario’s publicly-funded colleges, universities, and research hospitals. It supports capital-intensive industries such as energy and environment, advanced manufacturing, advanced health technologies, IT, and digital media with an eye to creating new jobs, products, services, technologies, and businesses. Operating province-wide with its headquarters in downtown Toronto, the organization currently administers the province’s pilot Collaboration Voucher program.

EXTREME START-UPS
Extreme Start-ups is led by a group of leading Canadian venture capital firms, including Extreme Venture Partners, Business Development Bank of Canada, Reley Ventures, and OMERS Ventures. Its programs include founders development, mentorships, access to venture capitalists and industry partners, and free workspace.

Toronto needs to leverage the strength of all of these programs to help innovative start-ups and small businesses grow. Opportunities for partnership and collaboration may enhance their effectiveness to become greater than the sum of their parts but in many cases the greatest barrier to success is an information gap among businesses. Greater knowledge of and participation in these programs may be key to helping businesses increase their investment in productivity enhancers and capitalize on their innovations.
innovation output in Canada. These firms have a higher tolerance for risk and a stronger drive to develop business improvements on a continual basis. SMEs need to innovate as a core part of their business to catch up to Toronto’s US competitors.

AREAS FOR CONSIDERATION

Improvements in management education within SMEs. Small business owners and managers tend to be less educated on innovative management techniques and therefore less likely to introduce process or marketing improvements. A possible initiative to address this could include a pilot program whereby cluster associations or innovation support organizations such as MaRS or OCE could partner with business schools to coach small business owners and managers on effective management practices.

Encouragement of SMEs to create a plan for introducing an innovation within five years. To increase participation in the many programs and incentives offered to SMEs targeted at innovation, policy makers can introduce a campaign to help businesses create a plan to introduce an innovation. This campaign would aim to raise the share of SMEs implementing innovations from the current level of 40 percent to at least 50 percent. This could be accomplished with the help of cluster organizations or key regional players like MaRS. This would have a significant impact on overall innovation levels, given the overwhelming proportion of Toronto businesses that are SMEs, and would enhance the effectiveness of the many well-intentioned programs currently in place to encourage innovation among SMEs.

Partnering with cluster associations and Toronto start-up groups to implement new venture capital fund. This year, the federal government announced the creation of a new venture capital fund for Canadian entrepreneurs entitled the NorthLeaf Venture Catalyst Fund. The fund will be managed by Toronto-based Northleaf Capital Partners, and one-third of its funding will come from the Ontario and federal governments combined, with the remainder from the private sector.

This is welcome news for Toronto start-ups and early-stage companies, but to enhance the effectiveness of this fund, partnerships could be formed with Toronto cluster associations and start-up organizations like MaRS or OCE to expand on their ongoing initiatives. This would significantly benefit cluster development in the region, as bringing innovative new players to the market is crucial for spurring competition and supply chain development within clusters. Access to capital is also essential to ensure young businesses are able to grow.

Enhancing Toronto’s capacity for innovation and growth will have significant benefits for its economic potential. This should come from higher levels of innovation and output, and an innovation mentality among small and medium enterprises. These are both assets and tools for growth for the region. To succeed in the modern global economy, all businesses must strive to innovate or will risk falling behind.

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60 Brenda Bouw, “How Canada’s new venture fund money will be spent,” Globe and Mail, 10 February 2014.
4

FOUNDATION INITIATIVES

INFRASTRUCTURE AND HUMAN CAPITAL DRIVE GROWTH
Toronto’s economic vision cannot be achieved without strong infrastructure, such as transportation networks, electricity grids, water, virtual infrastructure, social infrastructure, and recreational facilities. Educational institutions also contribute to the infrastructure of a region, as the labour force gain the skills necessary to improve productivity. Together, these elements help businesses thrive, clusters to develop, and individuals to raise their standard of living.
INFRASTRUCTURE INCREASES the competitiveness and livability of a region, and therefore the Toronto region must continue to increase its public and private investment in this area. While there are many definitions of infrastructure, this report refers to transportation networks including transit and roads; energy such as electricity grids; water; virtual infrastructure such as broadband internet access; social infrastructure such as hospitals, schools, and community centres; recreational facilities; and educational systems.

The Board and the Institute are targeting four key foundation initiatives that drive growth and productivity. These have been identified in the media, in discussions in the e-Brainstorming sessions, and in the Board’s reports as the most pressing areas of infrastructure that require investment to help maintain the competitiveness of the region. Investment in the following areas will bring about many economic benefits:

- Transportation networks – Expansive transportation and transit systems enable the movement of goods and people within the region, connecting suppliers, customers, and businesses. Investment in the maintenance and expansion of these systems increases the capacity to accommodate new residents and businesses.
- Virtual infrastructure – Smart regions that use Big Data and advanced technology in their infrastructure systems are better able to meet the demands of businesses and citizens while keeping costs low for users. They also help governments make better economic decisions that benefit businesses and citizens.
- Energy – Reliable, stable, and affordable energy systems are integral to enabling the operations of the region’s businesses, powering the homes of residents, and attracting businesses to locate in the region.
- Human capital – Strong educational systems and vocational pedagogies increase the matching of worker skills and knowledge to jobs. Better job and skill matching increases worker productivity and profit for companies.

As the Toronto region continues to grow, infrastructure becomes the necessary precondition for economic growth. The region is expected to add on average 120,000 new residents to its population annually, placing new demands on infrastructure from roads to electricity to educational institutions. Additionally, with recent summer flooding, ice storms, and changing weather patterns, many core elements of the region’s infrastructure have been rendered obsolete.

The Board’s detailed examination of the state of infrastructure in the Toronto region found an infrastructure deficit of $30 billion. The Board joins many research organizations and businesses, such as Siemens Canada, the OECD, and PricewaterhouseCoopers, in their wariness of the region’s underinvestment in infrastructure and the potential impact on the competitiveness of Toronto. The region needs an increase in sustainable infrastructure investment from governments and businesses as infrastructure forms the foundation for economic activity. To achieve the economic vision set out in this report, Toronto will need better regional transportation, reliable and stable electricity and energy sources, smart technology to integrate Big Data with business and infrastructure, and a more vocational pedagogy incorporated into its educational structures.

TRANSPORTATION NETWORKS BRING ECONOMIC BENEFITS

It is undeniable that the Toronto region requires improved transportation networks, as they are drivers of economic growth. The primary concern expressed in KPMG’s consultations with the Board’s members for this report revolved around transportation systems. The problems plaguing the region are not new, but they are pressing. Transportation infrastructure in the Toronto region is long overdue for a major upgrade – and in some cases overhaul – and will undoubtedly be a major theme in the elections across the province and in Toronto, according to the Board’s Think Twice, Vote Once – Decision 2014 discussion paper. It is integral that the municipalities in the Toronto CMA work together to deliver and benefit from infrastructure developments, particularly in public transit. That will require political leaders to put aside their differences and work together to make the investment in future prosperity. A critical challenge facing political leaders is the basic question of how to pay for the minimum of $2 billion per year of investments required to fully realize a regional transportation plan. In the Board’s 2013 discussion paper, A Green Light to Moving The Toronto Region: Paying for Public Transportation Expansion, four revenue tools (parking space levy, sales tax, fuel tax, and high occupancy vehicle lanes) were put forward for serious consideration as a way to cover the costs of these massive investments. Now is the time for candidates in upcoming elections to elaborate on how they plan to pay for public transportation expansion and on-going operations.

As the Board has detailed in its Scorecard on Prosperity series, overstretched transportation networks are the most serious barrier to economic growth in the Toronto region. Current transportation infrastructure puts Toronto in fourteenth place on the share of the region’s population that does not drive to work, and fifteenth place on commuting times in the most recent Scorecard.

63 Toronto Region Board of Trade, Toronto as a Global City. Scorecard on Prosperity - 2014, 2014.
In 2007, *The Big Move*, the answer to a regional transportation plan, was developed by the then newly created Metrolinx. Nearly a third of *The Big Move*’s $30 billion worth of transit expansion is underway, but the next wave of projects will require a dedicated stream of funding.

An efficient and expansive regional transportation system is economically productive for a number of reasons:

- **Delivers immediate benefits** - including decreasing congestion, pollution, and upfront commuting costs
- **Allows clusters to develop** - Urban agglomeration externalities, such as more movement of employees and the sharing of knowledge between businesses and individuals, enable the proper functioning of clusters.
- **Maximizes human capital** - When workers have more choice of employment locations that are easily accessible by transit, they can find jobs for which they are better matched and that align with their skills. When skills are properly matched to work, productivity increases. Transit can also fight poverty, because low-income individuals are able to travel to more locations cost effectively.
- **Creates larger talent and employer pools** - Businesses can also tap into a large pool of talented workers, and individuals do not have to rely on a single business for employment.
- **Leads to higher wages** – Better matching of employees’ skills to jobs increases productivity and prospering businesses and organizations, which can lead to higher wages. Furthermore, the provincial government, and even more so, the federal government, greatly benefit from the additional taxation revenue from higher wages.64

These benefits are but some of the economically productive effects of building transit that the Toronto region is currently missing out on. These missed opportunities cost the region between $1.5 billion to $5 billion annually, on top of the existing $6 billion in lost productivity from congestion, as calculated by the Toronto Region Board of Trade.65

Moreover, roads are also integral to enabling the movement of goods and people across and within the Toronto CMA. Although the region has a healthy number of highways, the mass volume of vehicles on these highways makes Highway 401 the busiest in North America, with 500,000 daily vehicles.66 Heavy usage of these highways and roads without regular and proper maintenance leaves Toronto vulnerable to the increased cost of ailing infrastructure. While there are many plans in place to improve roads and highways, such as the Gardiner Expressway, they are still far from the upgrades that are necessary to catch up to the volume of vehicles on the roads.

Cars have enabled individuals to choose where to live and work. Most workers drive instead of taking public transit to work. This is particularly true for those who do not live in the downtown core. For example, only 24 percent of those who work in the downtown Toronto core drive to work, while 97 percent of those who are employed in Meadowvale in Mississauga drive to work. The lack of public transit in many areas of the Toronto region is a significant concern, especially as municipal elections draw near. The reliance on vehicles and the impact of congestion costs on the region’s competitiveness must be addressed.

**AREAS FOR CONSIDERATION**

**Increases in transportation infrastructure investment.** As the Board will explore in greater detail through two forthcoming papers, Toronto will be required to make significant strategic investments into road and transit infrastructure as part of both state of good repair and expansion. While public and media attention has largely focused on the need for transportation infrastructure expansion, especially transit, an equally large fiscal challenge is looming with respect to the maintenance of existing assets. Quantifying the latter challenge, alongside other known fiscal pressures at the municipal level, will be a central focus of one forthcoming paper.

The Board has heard from large companies, small businesses, and labour groups, about the massive costs and strategic disadvantage traffic gridlock is causing their firms and workers. As part of its *Think Twice, Vote Once – Decision 2014* campaign, the Board will be releasing a separate paper spotlighting critical transportation related issues, including:

- **Funding** - How can the region fund and finance needed public transportation improvements and what revenue sources can be tapped to cover these costs?
- **Governance** - How can decisions about public transportation be made and actually implemented? Are the existing transportation governance structures including Metrolinx and other local operators fit for this purpose?
- **Optimization of economic benefits** – How can future transportation initiatives optimize economic benefits through robust project selection and evaluative criteria?

**VIRTUAL INFRASTRUCTURE IS INTEGRAL TO SMART REGIONS**

Virtual infrastructure, such as broadband internet access and advanced technological systems, is integral to smart regions. Smart regions use and create Big Data, which are massive amounts of data that are collected, analyzed, and then used to make informed and evidence-based decisions.

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65 Ibid.
The advent of more computing capabilities built into faster computers, more efficient and user-friendly software, and cheaper access to this technology is spurring this ability to collect and use Big Data for many purposes, including raising economic productivity. Collecting and analyzing Big Data can lead to new business ventures, help make better business and economic decisions, and help individuals lead a more productive life. For example, WeatherFX, a US company captures weather data and sells trend information to companies after finding correlations between weather and consumer behaviour. Companies then use this information to ensure that certain products are stocked according to weather patterns.67

Collecting data should leverage existing technologies as well as new ones. Smart technology is one of the best methods for this. IT solutions are able to produce large performance improvements from infrastructural elements, such as traffic systems and energy metres, often providing a higher rate of return on investment, while collecting information that can be stored and analyzed to create even more improvements and help make better decisions.68

In transit, the Presto card, when fully implemented, should replace the Metropass and tokens, so that usage patterns can be tracked and analyzed. Sensors and other tracking devices placed on subway cars, buses, and streetcars will feed real-time information, beyond that of their locations. All of this is mapped against existing GPS units in vehicles to improve traffic flow and decrease congestion. These devices also quickly identify the location and type of mechanical breakdown, cutting downtime, and ensuring smooth operation of transit.

An Intelligent Transportation System (ITS) is one way to address the road congestion problem without increasing capacity or lowering demand. The Toronto Intelligent Transportation Systems Centre estimates that optimized traffic lights that change based on demand could lower delays at intersections by up to 60 percent, hence decreasing idling time, a major contributor of greenhouse gas emissions. If tolls were installed on highways, a computer monitoring system could automatically adjust fares based on demand, so that capacity is never exceeded.69

Some cities are already taking advantage of Big Data and other computing technologies, such as mobile devices and the cloud, to gather and disseminate data. Melbourne’s Yarra Trams, which is the largest tram system in the world, tracks each of the 91,000 pieces of equipment in the system so that maintenance issues are quickly detected and diffused and users can receive delay and alternate route information.70

AREAS FOR CONSIDERATION

Creation of public-private partnerships for Big Data and smart technologies development.

Investment in collecting Big Data and using smart technology is both a private and public endeavour, often a joint one. It requires businesses to work with post-secondary institutions and/or their internal R&D teams to develop smart technologies, which in turn are sold to other companies or government departments to work with existing infrastructure. Often this intersection of business and government is an opportunity for public-private partnerships that deliver better benefits and results than individual efforts. One example is the Big Data Initiative at the Massachusetts Institute of Technology. MIT is partnering with government and businesses to address real world issues and find ways of solving them. The Initiative is developing technology to meet the next generation of data challenges in various fields, including finance and healthcare.71 The technology will also point to the endless possibilities of making transportation networks more efficient and reliable and fostering the economic activity and productivity in a region. Like all forms of new technology and ideas, transportation requires investment and support from all levels of government. More important, the investment is needed now to develop a strong strategy that incorporates technology and data into the larger transit debate.

A recent report by telecommunications giant Ericsson provides some insights that are applicable to Toronto on how to create truly smart regions by leveraging IT and virtual infrastructure. These include:

- Developing a regional virtual infrastructure strategy that is integrated into the overall vision of the region and recognizes IT as a part of infrastructure
- Ensuring that virtual infrastructure is part of municipal activities and transportation, health, and education investment decisions
- Educating government workers on IT and virtual infrastructure to ensure competence on using smart IT solutions
- Promoting regional innovation through public–private partnerships
- Creating a policy environment that is supportive of and driven by IT, and encourages regional coordination on the implementation of IT solutions.72

ENERGY INFRASTRUCTURE IS KEY TO ECONOMIC DEVELOPMENT

The Board has identified energy as one of the key factors shaping the region’s attractiveness to businesses...
and investors. This was further reinforced by business leaders in the Toronto region who expressed their unease about rising energy costs in the KPMG e-Brainstorming sessions. Energy, particularly electricity, is part of the foundational infrastructure that supports a regional economic development strategy that focuses on cluster development. Electricity use and costs are factors of production and therefore should be managed closely so that they do not affect businesses’ decisions or affect the production process in a way that disadvantages businesses’ outlook of Toronto’s economy.

A recurring theme in energy policy, and in the energy sector, is the concept of reliability. It refers to the electricity grid’s capacity to distribute energy at all times, regardless of system stress or demand levels. The cost and reliability of energy supply have a significant impact on business competitiveness.73

For a region like Toronto to remain competitive and attractive for business and industries, reliable energy distribution infrastructure needs to be in place. This was demonstrated more than once in 2013, as the region faced two major power outages during a severe rain storm in July and an ice storm in December. In the latter case, 300,000 people across the region were left without power, some for as long as nine days. Estimates of the recovery cost to Toronto Hydro alone were as high as $10 million.74

An important component in ensuring the Toronto region’s long-term energy security is capacity management. This can facilitate the rebalancing of different electricity generation sources, which will help guarantee fluctuations in demand, power outages, and rationing can be dealt with. In addition, given Toronto’s industry mix and economic importance, dedicated distribution channels for energy might help alleviate the pressure in the system, as well as increasing reliability for this important part of the region’s infrastructure.

**AREAS FOR CONSIDERATION**

**Development of a regional energy strategy.** Toronto Region needs an energy strategy that ensures a secure and reliable energy supply for its residents and businesses. This must be a balanced approach that includes improvements in grid connectivity to energy supply points outside the region and enhancements in local energy distribution and generation capacity.

**Expansion of innovations in local energy generation and storage.** Toronto can draw on its thriving Power Generation and Transmission cluster to help improve the region’s ailing energy infrastructure. Opportunities exist to expand on ongoing research into energy generation and storage. A recent innovation in underwater energy storage produced by MaRS company Hydrostor, for example, is now being used in the first international commercial agreement for a technology of its kind.75

By expanding on these innovation opportunities, Toronto can improve the stability of its energy grid and energy supply, and generate high value exports internationally.

Partnerships between research centres and universities could boost the innovation capacity of the sector in areas that could improve the energy grid and create export opportunities. This will have significant economic benefits for the region.

**Increases in investment in Ontario’s energy grid.** Toronto is in need of a substantial shift in public energy policy to ensure this crucial input for businesses is effectively maintained. Without significant investment from government to replace aging infrastructure and improve the grid, Toronto will continue to face rising energy costs and poor reliability.

**HUMAN CAPITAL MANAGEMENT IS CRITICAL**

Toronto should consider a new vocational approach to post-secondary education. Lack of skilled labour to fulfill business requirements is a primary concern among Board members and key stakeholders. Throughout the e-Brainstorming sessions with Board members and during its 2012 Economic Summit, the Board heard frequently the growing challenge for business leaders to attract skilled workers to meet their needs. Trends toward advanced manufacturing, technological change, and global competition have all highlighted the need for the best people to fill job requirements.

To connect people more effectively with the skills required to help businesses grow and become more innovative, programs should be created with job requirements in mind. Education is a foundation initiative that provides students with the necessary skills to become the future business leaders who will work toward achieving Toronto’s 2025 productivity goal. To get there, educators and business leaders must work in concert and strive to address regional labour demands.

Tackling this challenge is one of the most pressing tasks facing policy makers and business leaders today, but Toronto stands on solid ground. With a growing Education and Knowledge Creation cluster and an ever-increasing pool of skilled labour from all over the world, Toronto has the tools to succeed in the race to secure the best talent.

73 Toronto Region Board of Trade, Businesses take the lead, Economic Summit Report, 2012.
75 Tom Rand, “MaRS client Hydrostor signs underwater energy storage agreement in Aruba,” MaRS, 29 October 2013.
AREAS FOR CONSIDERATION

Expansion of co-op and entrepreneurship programs. Education in the province and Toronto region could benefit from a more vocational pedagogy in its teachings. This would emphasize a combination of core skills, such as numeracy and literacy, and work-based learning to ensure students are adaptable and have the hard skills that they can apply to the workplace. By increasing core and practical skill development in post-secondary education, Toronto will be much better equipped to fulfill its future labour market needs.

Various colleges and universities have established entrepreneurship and co-op components to their programs to ensure graduates have useful skills for employment. For example, over the next twenty years, Ryerson University aims to have 10 percent of its students involved in the development of a company, product, or service by the time they graduate following the success of its Digital Media Zone in 2010. This program and approach are effective in translating academic learning into business-oriented skills. Toronto post-secondary institutions should strive to add vocational elements, either through partnerships or the development of their own experiential learning curriculum, to all programs to maximize their economic value.

Tailoring university and college programs to meet cluster organization and business needs.

Toronto has an extensive network of cluster organizations aiming to connect companies with skilled labour and to establish common needs and challenges across their respective industries. This practice is commonplace among colleges, but should be expanded and upgraded to include all post-secondary institutions and extend to newer and evolving industries. Partnering with cluster organizations could facilitate the development of highly successful programs. University-college joint programs are becoming increasingly popular in Toronto, as they take advantage of the academic and applied learning offered by each type of institution. The next step in creating innovative programs that maximize the productivity potential of our labour force is to partner with business leaders to design programs that are industry-specific. In today’s fast-paced economy with shifting business needs, closer connections between business leaders and educators are vital to remain competitive.

Businesses, labour, citizens, and governments draw on Toronto’s existing infrastructure to increase productivity and innovation. The region requires continued investment in its transit, road transportation, and energy systems. Big Data and smart technologies can make these systems more efficient, and Toronto can capitalize on these emerging and existing technologies through public-private partnerships. In turn, a technologically advanced infrastructure network in Toronto will help pave the way toward the economic vision of productivity growth that this region needs. Post-secondary institutions must refine their programs to reflect the skills required for the workplace.
5

ORGANIZATION AND IMPLEMENTATION

REGIONAL GOVERNANCE CAN TACKLE CHALLENGING ISSUES
Enhancing Toronto’s regional strength demands a governance structure that can operate across geographic boundaries. Strong governance structures will help the region build better transportation networks, attract more business, and tackle core economic issues collectively. Each of these is necessary to realize this report’s economic vision for Toronto.
TORONTO REGION LEADERS FACE TOUGH GOVERNANCE CHALLENGES

THE BOARD HAS CONDUCTED extensive research on city regions around the world that have successfully integrated many of their planning, infrastructure, and governance activities. It found that strong economic performance is predicated on effective regional governance structures. Conversely, weak governance structures have the potential to stymie infrastructure planning and upgrades and the competitiveness of businesses.76

The e-Brainstorming session participants lamented the state of regional politics and demanded that strong leadership and increased collaboration be in place. These sentiments add to the Board’s extensive commentary on the coordination and governance challenges plaguing the Toronto region. Governance, or the way problems are solved and society’s needs are met, go hand in hand with coordination.77 The lack of coordination in the Toronto region is creating fragmentation in by-laws and planning, increasing the administrative hurdles and duplication that businesses and citizens face on a regular basis.

While many areas in the Toronto region require strong governance, the most prominent ones are in transportation planning and execution, fiscal capacity and taxation powers, trade missions to attract foreign direct investment, and productivity-enhancing schemes. Improving governance structures and coordination in these four key areas will enable the Toronto region to meet its productivity growth target of 10 percent by 2025.

REGIONAL TRANSPORTATION NETWORKS REQUIRE STRONG GOVERNANCE

Building regional transit in Toronto is a difficult task because of the coordination required. There are sixteen different transit authorities in the Toronto region, some pan-jurisdictional and some solely operated within a particular region. Each of these municipalities is affected by The

Big Move and is therefore involved in the process. This is in addition to the existing transportation networks that require coordination for upkeep of roads, especially as many of them cross traditional municipal boundaries.

With nearly 197,000 workers commuting out of the City of Toronto daily and more than 453,000 employees commuting in, the need for an integrated transportation system and The Big Move is greater than ever.78 Both higher orders of government are providing some funding but the operation and maintenance of the transportation systems and networks continue to be under local jurisdictions.

AREA FOR CONSIDERATION

Improvements in the governance structure for transportation planning and execution. The province, through Metrolinx, has taken ownership of the planning of regional transit, but the Ontario government must ensure that Metrolinx is an effective organization that has the authority and structure to undertake the necessary actions for transportation expansion. The government must also consider options on how to better integrate multiple transportation systems within the Toronto region. Furthermore, this must be accompanied by coordination in the planning, upgrade, and maintenance of road transportation infrastructure.

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78 Calculations by the Economic Development & Culture department at the City of Toronto using 2011 National Household Survey data from Statistics Canada.
Strong Governance Calls for Increased Fiscal Capacity

Toronto’s infrastructure needs are great but the region is encumbered by what are widely recognized as constraining fiscal relationships with senior levels of government (provincial and federal). Despite the fact that cities are responsible for delivering the bulk of public services, everything from policing to social housing, on average they only collect 8 cents of every dollar, while the other 92 goes to the province and federal government. Given Toronto’s infrastructure deficit, estimated at $30 billion, new funding solutions are required that draw on the funding resources of all three levels of government.79 A potentially important contributor to the infrastructure investment needs of the Toronto region is the federal government’s recently renewed Building Canada Fund. The previous iteration provided important funding for such projects as the Union Station revitalization and the Toronto Spadina York subway extension. Nevertheless, moving forward, all three levels of government should explore opportunities to create reliable and long-term funding streams through this program that are not beholden to the electoral cycle, nor solely dependent on individual project application based processes. Indeed, in certain cases such processes can unduly delay and limit the kinds of investments urban regions like Toronto can make in critical infrastructure.

The region has functioned extraordinarily well given the increased service delivery demands and responsibilities from federal and provincial downloading, but to move forward, changes must occur at all levels of government. Governance structures are in part designed to enable businesses and individuals to be productive. But when they create barriers to increasing efficiency or accessing support systems such as infrastructure, the potential for Toronto to thrive is dampened.

Area for Consideration

Potential for increasing the region’s taxation powers. The Ontario government has attempted to increase the fiscal capacity of the Toronto region. However, the Board found that, in spite of this increase, municipalities simply cannot absorb the projects for improving infrastructure.80 The region faces major capital investment needs, both in terms of operation and new construction. As such, the Board will be releasing a paper documenting the existing fiscal capacity of governments in the region to pay for these investments and advancing creative solutions to closing the infrastructure gap. These will include a mix of strategies and approaches covering both the expenditure and revenue side of the income statement and explore ways of ensuring the burden of paying for these investments is fair and equitable and does not impact the competitiveness of our businesses. To ensure that the region can meet its infrastructure needs, the Ontario government should revise municipal legislation and provide the region with more powers to raise revenue, especially in the area of taxation.

Currently, under the Constitution Act of 1867, cities are “creatures of the province,” and therefore under provincial purview.81 In a Toronto region context, the issue of municipal taxation and fiscal powers was dealt with to some extent in 2006 with introduction of the City of Toronto Act (COTA), which provided broad authority for the city to raise taxes, except in certain prescribed areas (e.g., income tax). Nonetheless, in view of the regional nature of infrastructure demands, most notably transportation, new approaches need to be looked at which strengthen the fiscal capacity for the region as a whole, not just the City of Toronto. Of course, this would entail considering new governance and collaborative structures involving, lower, upper and single-tiered municipalities in the region. Therefore, it is absolutely necessary that the province and municipal governments in the region begin an open dialogue examining new fiscal models that help reduce the infrastructure deficit and thereby improve the competitiveness and productivity of the region’s businesses.

Better Regional Governance Helps Attract Business Investment

Achieving the economic vision highlighted in this report relies on enhancing Toronto’s clusters to improve productivity and innovation. Yet the businesses and individuals operating within these clusters are often situated across the Toronto CMA and are therefore governed by different by-laws and use varying infrastructure systems. The Toronto CMA is made up of a single-tiered municipality (Toronto) and four upper-tiered municipalities or regions (Durham, York, Halton, and Peel), each with its own lower-tiered municipalities for a total of twenty-four lower-tiered jurisdictions. This can create unnecessary administrative hurdles when deciding where to locate a business and pits jurisdictions within the region against each other as they compete for businesses and customers. Therefore, regional coordination must occur in order for the region as a whole to benefit economically and to avoid the competition for businesses and customers between jurisdictions.

A PricewaterhouseCoopers report commissioned by the Greater Toronto Marketing Alliance (GTMA)

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80 Toronto Region Board of Trade, Think Twice, Vote Once – Decision 2014, Discussion Paper, 2014; Toronto Board of Trade, Reaching top speed – Infrastructure Unleashing Ontario’s ability to grow, 2011.
81 According to Constitution Act 1867, s. 92 (8).
recognizes the importance of regional coordination, particularly in light of the objective to increase foreign direct investment (FDI) in the Toronto region. The report found that global FDI is integral to economic growth, as it grew 75 percent faster than GDP between 1990 and 2011 and in order to build on these efforts, the GTMA’s funding and better coordinating efforts at the regional level should be enhanced to attract business investment. However, to ensure municipal alignment and truly maximize efficiencies, Toronto must have a new or revised model of governance to complement any future consideration of increases in funding. The same report highlighted that Montréal and London were able to generate seven and four times, respectively, as many FDI projects as the GTMA in relation to the size of the local economy because of synergies and economies of scale, better coordination with other FDI organizations and a more focused approach to all aspects of their operations. The Toronto region needs to follow this example but to do so beyond just for FDI activities and instead for all economic ones.

**AREA FOR CONSIDERATION**

**Regional coordination of trade missions and investment promotion.** A great challenge for the Toronto region is attracting businesses to invest and locate within the region. While this is common to all urban regions, Toronto’s fragmented approach inhibits its success. The region has a disaggregated approach to representation and trade missions. It is commonplace for individual municipalities within the GTA, such as Toronto, Mississauga, or Markham, to host separate trade missions without the participation of any regional body. Thus efforts to attract investment and businesses are often underfunded or duplicated. To attract global talent and capital, a more regionally focused strategy is essential.

The Toronto region has the potential to attract trade and businesses from a diverse range of industries. No one municipality garners strength in all industries, and together they form a solid base of cluster linkages and diversification. Toronto needs to realize its potential as a region rather than a collection of highly successful yet individual municipalities.

All three levels of government employ over 200 individuals in more than twenty different organizations in an effort to bring jobs and investment to the region. Combined, the governments spend $30 million dollars to sustain a fragmented approach that does not serve the interests of the Toronto region or Ontario. This money could be better directed toward more productive purposes, such as creating or funding a single organization to fulfill these functions.

Toronto should have a singular voice that represents the region internationally to attract investment

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82 PricewaterhouseCoopers, Greater Toronto Marketing Alliance: Roadmap to revitalization, 2013.
83 Ibid.
and new business. The GTMA was founded to fulfill this role, but its roles and responsibilities are often overlapped and duplicated by other municipal bodies. The inevitable outcome, is that each municipality strives to attract business to their respective municipality rather than to the region as a whole, to the detriment of the regional economy. Integrating trade and investment promotion at a regional level would better enhance the region’s ability to entice talent and capital from a broad range of industries and countries. This would generate more opportunities to boost regional cluster development and create a more cohesive global engagement and branding strategy.

A PRODUCTIVITY INITIATIVE FOR THE TORONTO REGION WOULD RAISE BUSINESS COMPETITIVENESS

Low productivity is one of the greatest challenges Toronto faces with an aging population and increasing global competition. This problem affects businesses across the province in all industries. Lack of productivity-enhancing investments and poor adoption of best management practices all contribute to Toronto’s lagging economic performance and missed prosperity potential.

Alberta is one province that has stepped up to the mark in improving its productivity scores. With the highest productivity level and the highest productivity growth of the Canadian city regions measured, Alberta’s largest city of Calgary is unquestionably the national leader in economic performance. This is largely due to the strength and rapid growth of the province’s resource sector; however, one provincial initiative that may have contributed to Calgary’s success is the creation of Productivity Alberta.

In 2008, the provincial government established Productivity Alberta to help increase productivity and competitiveness among small and medium enterprises in the construction and manufacturing sectors. Now a private, non-profit corporation, Productivity Alberta offers a range of services that help businesses identify and address productivity gaps, as well as increase efficiency. Featuring coaching and workshops, it disseminates the latest productivity improvement tools, resources, and services to businesses across the province.

AREA FOR CONSIDERATION

Addressing gaps in productivity through the creation of a Productivity GTA. The Toronto region and Ontario as a whole would greatly benefit from the establishment of an initiative modeled after Productivity Alberta. Ontario’s current public policy approach emphasizes financial incentives to introduce business improvements, such as tax credits for R&D and other investments. Yet this carrot has been met with relatively little uptake. Alberta’s more proactive approach offers a less costly, and potentially more effective, method of encouraging businesses to improve their operations.

While the creation of a Productivity Ontario would be highly beneficial for Toronto, a more regional focus to this initiative may be more successful in disseminating best practices and identifying regional-specific problems. Improving Toronto’s productivity would have tremendous benefits for the province as a whole. Tailoring the program to local needs and challenges may further enhance success.

Leaders must act now to continue the progress made in developing effective regional governance structures and tipping the region’s fiscal imbalance back into its favour. The future of Toronto’s productivity growth and prosperity demands this. Without effective regional governance and initiatives to tackle lagging productivity and business growth, Toronto’s economic strength will continue to deteriorate, as core planning and development challenges persist. But most importantly, Toronto must begin to realize its strength as a region rather than a collection of municipalities. This governing ethos will likely take years to adopt fully, but it is clear that the way forward is to act collectively.
Toronto needs bold action to realize this report’s economic vision.
This report from the Board and the Institute seeks to provide business leaders, policy makers, and stakeholders with guidelines for economic action. Toronto has a number of laudable strengths, but is falling behind on the most important measure for economic performance: productivity. Its competitors are not standing still, making the challenge to compete ever more pressing. The four pillars of regional competitiveness are the tools Toronto needs to succeed.
IMPLEMENTING A REGIONAL ECONOMIC STRATEGY WILL HELP TORONTO ACHIEVE THIS REPORT’S ECONOMIC VISION

THE ECONOMIC VISION for the Toronto region focuses on productivity gains as the core measure for economic success. Achieving greater productivity will enhance the region’s prosperity in countless ways. Having more productive workers will entice more businesses and investment to the region in order to capitalize on the region’s competitiveness. Greater wealth and economic output will expand the region’s tax base and enable policy makers to invest the substantial sums needed to improve infrastructure. But most of all, boosting productivity is necessary for Toronto to take its level of prosperity from good to great.

Toronto’s negative productivity performance cannot continue if the region is to enhance its economic strength. The Board, with research support from the Institute, has set an ambitious but highly feasible target for the region to boost its real GDP per worker by 0.6 percent annually to achieve a growth of 10 percent between 2010 and 2025. This will raise the region’s level of productivity by nearly $7,000 from its 2010 level. The Board has laid out a number of areas for consideration to meet this target, but the key message is that the region needs a strategy and it needs to tackle some hard-hitting issues. The Board and the Institute urge business, academic, and government leaders to consider the critical areas highlighted in the report and work toward a regional strategy that will implement necessary changes.

TORONTO CAN BUILD ON ITS CLUSTERS

A key area to be considered for a regional economic strategy is cluster-led initiatives. Toronto has the second highest share of employment in traded clusters of the North American peers. They are a tremendous asset for the region. But Toronto’s low wages in traded clusters, low productivity, and low patent output compared with US peers indicate that they are not achieving their competitive potential.

However, the Board and the Institute have examined five clusters that could form part of regional efforts to increase productivity. While the combined clusters only account for roughly 15 percent of Toronto’s workforce, they have significant potential to improve their productivity performance as well as create spillover benefits for the regional economy. That way other clusters in the region will draw strength from the clusters highlighted in this report (Exhibit 25).

Exhibit 25: Actions in Toronto’s clusters will have broad economic benefits

**EDUCATION & KNOWLEDGE CREATION**
- Opportunities to capitalize on introduction of innovation vouchers to bridge Toronto’s business and academic communities
- Creation of a higher education advocacy group for Toronto
- Initiatives to build on the excellence of Toronto’s college network

**FINANCIAL SERVICES**
- Opportunities to streamline compliance requirements in order to facilitate greater innovation (e.g., uptake of new software)
- Diversification of revenue sources through consideration of exports and investments in new global markets.

**INFORMATION TECHNOLOGY**
- Ways of building on unique growth opportunities for all business sizes from SMEs to large firms
- Uptake of new Canadian software applications
- Opportunities with senior levels of government to create tax credit for software investment
- Cluster-based strategies (e.g., joint workforce development and capital investments) to spur innovation
- Collaboration with private and public sector funding bodies on ways to expand access to capital

**PROCESSED FOOD**
- Opportunities in markets abroad
- Investment in machinery and equipment to improve productivity
- Potential for increased scale to boost employment and sales
- Ways of encouraging up-skilling of workers to grow the Processed Food cluster

**LIFE SCIENCES**
- Ways to capitalize on enhancing customer sophistication by drawing on government programs in disease management
- Opportunities to improve collaboration between scientists and entrepreneurs
INNOVATION AMONG SMALL- AND MEDIUM-SIZED ENTERPRISES WILL FACILITATE GROWTH

In addition to cluster-led initiatives, a regional economic strategy should also identify ways for businesses to improve their innovation performance. Poor innovation is at the heart of Toronto’s low productivity. Small- and medium-sized enterprises (SMEs), which account for the vast majority of Toronto businesses, are simply not developing or implementing new ideas, processes, or products at a competitive level.

To overcome this, a broad campaign could be initiated to boost innovation among Toronto SMEs. Policy makers could set a target to increase the share of SMEs introducing an innovation from its current level of 40 percent to 50 percent. This could be facilitated through the newly created innovation voucher program, as well as through partnerships with MaRS and OCE. Access to capital to introduce innovations could also be improved by forming partnerships between the NorthLeaf Venture Catalyst Fund and cluster associations. Workshops in management education could also be established to disseminate best practices among SME managers and owners, who have been shown to be less educated on management techniques than leaders in larger business.

This would greatly increase Toronto’s overall innovation levels, as small businesses account for the majority of the region’s firms but are less likely to innovate despite the many incentives and supports offered for them to do so. Toronto needs to improve its drive to develop better products, services, and processes if it is to match the productivity levels of its peers.

INVESTING IN FOUNDATIONAL TOOLS WILL LEAD TO GROWTH

Foundation initiatives form the third pillar of regional competitiveness. These consist of tools needed to enhance the region’s economic base, including transportation, smart technology, energy, and human capital. The region cannot function effectively without reliable and affordable energy or an efficient transportation network. Likewise, to succeed in the modern economy, a region needs to develop a strong, adaptable labour force that will maximize productivity. Toronto excels in many of these areas, but the Board has highlighted a number of ways the region can consider improvements.

UPGRADES TO TRANSPORTATION AND ENERGY INFRASTRUCTURE WILL CREATE BUSINESS OPPORTUNITIES

Toronto’s core infrastructure is long overdue for major investment. With gridlock, power outages, and energy costs all becoming increasingly problematic across the region, government leaders must recognize the importance of these essentials in Toronto’s everyday life and economic vitality. Without a well-functioning transportation network and reliable, affordable power, Toronto will risk becoming less productive and less attractive to businesses. Toronto can no longer be known for crumbling highways and a dysfunctional power grid.

Toronto’s energy and transportation infrastructure are in need of bold decisions and substantial long-term investments. The region should examine ways to develop more cohesive and forward-thinking strategies in these areas. They are necessary to improve the region’s productivity and prevent further deterioration of these economic foundations. Yet government should invest in foundation initiatives that not only upgrade infrastructure, but also create business opportunities.

These initiatives could include:

1. Ongoing innovations in energy research to improve the region’s power grid. Toronto is currently the site of major breakthroughs in energy storage. The province looks for ways to improve the reliability of Ontario’s electricity grid. This presents an area for consideration for policy makers and business leaders, as expanding on this area of research and development could improve Toronto’s energy grid and create export opportunities for high value added technologies. With a growing Power Generation and Transmission cluster, this initiative has clear potential for development.

2. Better transportation planning through a Big Data initiative. To address transportation planning issues, Toronto could create a Big Data public-private partnership that would make use of smart technologies to track the movement of people and goods. This would use smart technology developed by regional players, which could then be marketed to other businesses. The benefits for Toronto’s IT cluster, along with the creation of useful data for transit planning, would have significant economic impact.

These are but two ideas for how to tackle the region’s foundational issues while simultaneously creating business opportunities. Solving the region’s transportation and energy infrastructure problems requires bold and creative thinking on the part of government, but businesses can play a major role in using policy to leverage economic strength.
SKILLS AND BUSINESS REQUIREMENTS NEED TO BE BETTER CONNECTED

Toronto has an excellent network of high-performing colleges and universities that contribute significantly to the region’s innovation activity. However, this human capital strength is failing to translate into productivity gains.

Forming stronger connections between Toronto’s academic and research communities and its businesses will have extensive economic benefits. The growing “jobs without people and people without jobs” conundrum frequently cited in Board consultations will be mitigated through the development of programs that instill skills that are in demand. This will reduce unemployment and ensure businesses’ skill requirements are being met. Furthermore, facilitating partnerships with businesses and higher education to conduct innovation research will improve prospects for commercialization.

Two major steps should take place to realize Toronto’s potential as a landmark for innovation and strong human capital. First, post-secondary institutions should expand co-op and entrepreneurship programs. Ryerson University is one example of an institution that is making business and entrepreneurship skills a key component of its programs. This approach should be applied more widely. Second, universities and colleges must work more closely with cluster organizations to tailor their programs to business needs. In today’s fast-paced economy, business needs are constantly changing. This is why a combination of core and practical skill development is essential to build an effective labour force. Toronto has solid resources and people to build a prosperous economy, but the consensus from business leaders is clear: actions must be taken to maintain a competitive labour force.

Toronto should develop a new approach to post-secondary education that prioritizes core skills in literacy and academic learning, alongside applied skills that are job or industry-specific. Young workers today need to be both adaptable and job-ready. This challenge can be met by combining the strengths of Toronto’s applied and academic learning sectors and connecting businesses with students via educators. This robust approach to curricula development will have a major impact on the region’s human capital potential.

STRONGER REGIONAL GOVERNANCE WILL HELP FURTHER TORONTO’S ECONOMIC GOALS

A clear consensus among business leaders is emerging that, while businesses are becoming increasingly more integrated across the Toronto region, its regional governance is still based on a fragmented, ad hoc approach. This must change if Toronto is to join the ranks of the most prosperous city-regions in North America.

Toronto’s transportation issues are ultimately beset by the lack of cohesive regional governance in place to authorize planning and revenue generation. The municipalities are at the mercy of the province, drawing government leaders into negotiation each time a significant investment is needed. To attain any progress on building more and better public transportation in Toronto, cities and transit planners must have more authority to make decisions and generate revenue that will allow them to meet their economic needs. Transportation investment should no longer be stifled by political debate and negotiation.

The Toronto region could also benefit from more regional coordination of investment promotion. The Board and the Institute recommend consolidation of investment promotion into one agency. The current system of municipalities independently bidding for new businesses and investment fails to take advantage of the region’s strengths as a whole. Toronto’s municipalities need to act in concert and realize their collective interest in presenting one powerful voice to the international business community.

Toronto should also consider establishing a regional productivity initiative that will draw on local cluster-led initiatives to identify gaps in productivity and disseminate best practices across industries. The new organization could partner with Toronto business schools to improve managers’ education, a key impediment to growth and innovation among SMEs. This initiative would address one of Toronto’s productivity challenges and help inform policy decisions and form business linkages. This would help advance this strategy’s economic vision both by encouraging regional integration and boosting productivity.

Toronto’s economic challenges require bold solutions. In turn, its system of governance must move on regional strengths and goals. As the region grows, so too will its policy makers’ need to think big to generate effective solutions to complex problems. But more importantly, policy makers need the ability to organize and implement these solutions across the region. This must start with a regionally-focused governance structure that prioritizes economic needs.
The Board and the Institute call for increased investment in core infrastructure to promote economic growth and innovation. They look to clusters to play a key role in catalyzing business growth and to stronger regional governance to foster greater investment promotion and enhancements in productivity. The region cannot afford to stand idle. As the world becomes increasingly defined by urban regions, Toronto stands to gain enormously. The time is now for Toronto to implement a strategy for regional growth and take its place among the most globally competitive city regions.
APPENDIX I: DEFINITIONS OF CLUSTERS AND LOCATION QUOTIENTS

The methodology used in this report is based on the research of Professor Michael E. Porter and the Cluster Mapping Project.1

Clusters are geographically proximate groups of interconnected companies, suppliers, service providers, and associated institutions in a particular field.2 The raw data used to analyze Canadian CMA clusters were compiled from Statistics Canada’s Canadian Business Patterns database, which includes employment and number of establishments by six-digit NAICS code (North American Industry Classification System), as well as wages by four-digit NAICS code. The raw data for the US peer jurisdictions were compiled from Professor Michael Porter’s Institute for Strategy and Competitiveness Cluster Mapping Project database. These data were obtained from the US Census Bureau’s County Business Patterns database, which includes employment, number of establishments, and wages by six-digit NAICS code.

Industries are classified into three categories: local industries, natural resource-dependent industries, and traded industries. The first type, local industries, provides goods and services primarily to the local market. Such industries compete only in a limited way with other regions. The second type is natural resource-dependent industries. These industries compete with domestic and international locations, and employment is located primarily where natural resources are found. The third type is traded industries that are not resource dependent and sell products and services to other regions and often to other countries. Porter identifies forty-one clusters using the correlation of industry employment across geographic area. The principle is that industries that are normally located together are linked by external economies and constitute a cluster.

Location Quotient (LQ) is a way of quantifying how concentrated a particular industry cluster is in a region as compared to the nation. The formula used in this report is as follows:

\[
LQ = \frac{e_i}{E_i} / \frac{e}{E}
\]

Where:
- \(e_i\) = local employment in industry \(i\)
- \(e\) = total local employment
- \(E_i\) = total national employment in industry \(i\)
- \(E\) = total national employment

If the location quotient of industry \(i\) is higher than 1 for a region, this means the region has a higher concentration in industry \(i\) than the nation overall. The higher the location quotient, the higher the concentration within the region for a particular industry. Industries with a high LQ are typically (but not always) export-oriented industries, which are important because they bring money into the region. Industries which have both high LQ and relatively high total job numbers typically form a region’s economic base.

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## APPENDIX II: TRADED CLUSTER DEFINITIONS

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<tr>
<th>AEROSPACE ENGINES</th>
<th>AEROSPACE VEHICLES AND DEFENSE</th>
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<td>Aircraft; Missiles and Space Vehicles; Defense Equipment</td>
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<th>ANALYTICAL INSTRUMENTS</th>
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<td>Laboratory Instruments; Optical Instruments; Process Instruments; Search and Navigation Equipment; Electronic Components</td>
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<th>APPAREL</th>
<th>AUTOMOTIVE</th>
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<td>Men’s Clothing; Women’s Clothing; Hosiery and Other Garments; Accessories; Knitting Mills</td>
<td>Motor Vehicles; Automotive Parts; Automotive Components; Forgings and Stampings; Glass; Production Equipment; Small Vehicles and Trailers; Marine, Tank and Stationary Engines</td>
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<th>BIOPHARMACEUTICALS</th>
<th>BUILDING FIXTURES, EQUIPMENT AND SERVICES</th>
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<td>Biopharmaceutical Products; Health and Beauty Products; Containers</td>
<td>Plumbing Products; Drapery Hardware; Fabricated Materials; Heating and Lighting; Furniture and Fittings; Clay and Vitreous Products; Floor Coverings; Steam and Air-conditioning; Wood Cabinets, Fixtures and Other Products; Concrete, Gypsum and Other Building Products</td>
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<td>Management Consulting; Computer Services; Computer Programming; Printing Services; Marketing Related Services; Professional Organizations and Services; Engineering Services; Facilities Support Services</td>
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<td>Merchandise Wholesaling; Apparel and Accessories Wholesaling; Catalog and Mail-order; Food Products Wholesaling; Farm Material and Supplies Wholesaling; Transportation Vehicle and Equipment Distribution</td>
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<td>Video Production and Distribution; Recorded Products; Entertainment Equipment; Entertainment Related Services; Entertainment Venues</td>
<td>Depository Institutions; Securities Brokers, Dealers and Exchanges; Insurance Products; Real Estate Investment Trusts; Passenger Car Leasing</td>
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<th>HEAVY MACHINERY</th>
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<td>Final Construction; Subcontractors; Primary Construction Materials; Ceramic Tile; Equipment Distribution and Wholesaling; Fabricated Metal Structures and Piping; Explosives</td>
<td>Construction Machinery; Farm Machinery; Railroad Equipment and Rental; Mining Machinery; Machinery Components; Valves and Pipe Fittings</td>
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</table>
INFORMATION TECHNOLOGY
Computers; Electronic Components and Assemblies; Peripherals; Software; Communications Services; Fiber Optic Cable

JEWELLERY AND PRECIOUS METALS
Jewellery and Precious Metals Products; Costume Jewellery; Cutlery; Collectibles

LEATHER AND RELATED PRODUCTS
Leather products; Coated Fabrics; Related Products; Accessories

LIGHTING AND ELECTRICAL EQUIPMENT
Lighting Fixtures; Electric Lamps; Batteries; Switchgear; Electrical Parts; Metal Parts

MEDICAL DEVICES
Surgical Instruments and Supplies; Dental Instruments and Supplies; Ophthalmic Goods; Medical Equipment; Diagnostic Substances; Biological Products

METAL MANUFACTURING
Fabricated Metal Products; Metal Alloys; Precision Metal Products; Fasteners; Wire and Springs; Metal Processing; Iron and Steel Mills and Foundries; Nonferrous Mills and Foundries; Metal Furniture; Environmental Controls; Pumps; General Industrial Machinery; Saw Blades and Handsaws; Laundry and Cleaning Equipment

MOTOR DRIVEN PRODUCTS
Motors and Generators; Batteries; Motorized Equipment; Refrigeration and Heating Equipment; Appliances; Specialized Pumps; Specialized Machinery; Tires

OIL AND GAS PRODUCTS AND SERVICES
Oil and Gas Machinery; Hydrocarbons; Oil and Gas Exploration and Drilling; Pipeline Transportation; Petroleum Processing

PLASTICS
Plastic Materials and Resins; Plastic Products; Paint & Coating; Synthetic Rubber

POWER GENERATION AND TRANSMISSION
Electric Services; Turbines and Turbine Generators; Transformers; Porcelain, Carbon and Graphite Components; Electronic Capacitors

PREFABRICATED ENClosures
Recreational Vehicles and Parts; Mobile Homes; Trucks and Trailers; Gaskets; Elevators and Moving Stairways; Office Furniture; Household Refrigerators and Freezers; Aluminum Processing

PROCESSED FOOD
Milk and Frozen Desserts; Baked Packaged Foods; Coffee & Tea; Processed Dairy and Related Products; Meat and Related Products and Services; Flour; Specialty Foods and Ingredients; Milling; Candy and Chocolate; Malt Beverages; Paper Containers and Boxes; Metal and Glass Containers; Food Products Machinery

PRODUCTION TECHNOLOGY
Machine Tools and Accessories; Process Equipment Sub-systems and Components; Process Machinery; Industrial Patterns; Fabricated Plate Work; Industrial Trucks and Tractors; Ball and Roller Bearings

PUBLISHING AND PRINTING
Publishing; News Syndicates; Signs and Advertising Specialties; Photographic Services; Photographic Equipment and Supplies; Media Representatives; Printing Services; Printing Inputs; Paper Products; Specialty Paper Products; Inked Paper and Ribbons; Office Equipment and Supplies

SPORTING, RECREATIONAL AND CHILDREN’S GOODS
Sporting and Athletic Goods; Games, Toys, and Children’s Vehicles; Motorcycles and Bicycles

TEXTILES
Fabric Mills; Specialty Fabric Mills; Specialty Fabric Processing; Textile Machinery; Yarn and Thread Mills; Carpets and Rugs; Wool Mills; Fibers; Finishing Mills; Specialty Apparel Components; Tire Cord and Fabrics

TOBACCO
Cigarettes; Other Tobacco Products; Tobacco Processing; Specialty Packaging

TRANSPORTATION AND LOGISTICS
Air Transportation; Bus Transportation; Marine Transportation; Transportation Arrangement and Warehousing; Transportation Support and Operations; Airports
APPENDIX III: INNOVATION PERFORMANCE IN TORONTO CMA

PATENTS

Exhibit A: Toronto is near the bottom of North American regions in patent applications

Toronto CMA and North American peer regions, 2006-2010
Average patent applications per 10,000 employees

Note: Regional patent counts represent patent applications filed under the Patent Co-operation Treaty that are attributed to an inventor with an address in the region.

Exhibit B: Toronto’s patent holders are less likely to be from higher education

Toronto CMA and North American peer regions, 2006-2010
Share of region’s total patent count attributed to business enterprises and higher education (%)
VENTURE CAPITAL

Exhibit C: Toronto performs below the median in venture capital investment

Note: Figures were calculated using 2010 GDP figures converted to PPP.
Source: Institute for Competitiveness & Prosperity analysis based on data from Moneytree, Thomson Reuters; Organisation for Economic Co-operation and Development (OECD).

R&D

Exhibit D: Ontario performs at the median of R&D expenditure

Source: Institute for Competitiveness & Prosperity analysis based on data from the Organisation for Economic Co-operation and Development (OECD).
APPENDIX IV: KPMG E-BRAINSTORMING RESULTS ON BUSINESS COMPETITIVENESS AND CHALLENGES

KPMG and the Board conducted several e-Brainstorming sessions for this report and, in February 2014, spoke with participants on the strengths, challenges, and opportunities of doing business in the Toronto region.

THE PARTICIPANTS...

<table>
<thead>
<tr>
<th>ARE...</th>
<th>WORK FOR...</th>
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<tbody>
<tr>
<td>85% Toronto Region Board of Trade members</td>
<td>76% Toronto-based companies</td>
</tr>
<tr>
<td>76% Toronto-based companies</td>
<td>53% Export-oriented firms</td>
</tr>
<tr>
<td>53% Export-oriented firms</td>
<td>33% Companies that mainly sell outside of the Toronto Region</td>
</tr>
</tbody>
</table>

...the largest industry was professional services (25%)
- Professional services – 25.4%
- Other – 14.3%
- Communications/Media – 11.1%
- Banking/Financial services – 9.5%
- Higher education – 9.5%
- Technology/Software – 6.3%
- Health care – 6.3%
- Real estate – 4.8%
- Energy/Natural resources – 3.2%
- Retail/Consumer goods – 3.2%
- Transportation – 3.2%
- Industrial/Chemicals, Industrial/Construction – 1.6%

...41% work in large companies of 500 employees or more
- 500 or more employees – 41.3%
- 100 to 499 employees – 20.6%
- 50 to 99 employees – 1.6%
- 10 to 49 employees – 11.1%
- 1 to 9 employees – 25.4%

TOP 5 FACTORS THAT...

... ARE IMPORTANT TO BUSINESS
1. Quality of communications infrastructure
2. Quality of transportation
3. Skilled labour force
4. Low cost of doing business
5. Capital from banks

... ARE LESS IMPORTANT TO BUSINESS
1. Specialized facilities and labs for product testing and development
2. Specialized suppliers
3. R&D between post-secondary institutions and business
4. Availability of and ease of joining professional associations
5. Capital from venture capitalists/private equity/angel investors

... TORONTO REGION EXCELS AT PROVIDING
1. Availability of and ease of joining professional associations
2. Skilled labour force
3. Quality communications infrastructure
4. Specialized suppliers
5. Demanding customers

... TORONTO REGION PROVIDES LESS OF
1. Quality transportation
2. Municipal government regulations and procedures
3. Low cost of doing business
4. Capital from venture capitalists/private equity/angel investors
5. Capital from banks
Toronto region excels at providing skilled labour force, professional associations, and quality communications infrastructure that are important to business.

RESPONDENTS VOICED OPINIONS ON...

**...the financial factors that affect business**
- **Capital from banks**
  - Seen as necessary for growth
  - Flexible
  - Less risk adverse
  - For entrepreneurs and small businesses
  - Less regulatory burden
  - High bank fees
- **Cost of doing business**
  - Lower housing costs
  - Lower taxes
  - Lower energy costs
  - Lower labour costs
  - Less red tape

**...the infrastructure factors that affect business**
- **Communications infrastructure**
  - Uninterrupted
  - Reliability
  - High quality
  - Low cost
  - Timely/Fast
  - For customer interaction
  - Free wifi
- **Transportation**
  - Productivity
  - Employee morale
  - Fast
  - Accessible
  - Heavily invested in, including use of taxes
  - Predictable
  - Led by long term policy
  - Integrated across municipalities

**...the support factors that affect business**
- **Skilled labour force**
  - Young people and immigrants
  - Work skills
  - Education infrastructure investment
  - Connect with real career paths (e.g. internships)
  - Collaboration
  - Entrepreneurship
- **Municipal regulations and procedures**
  - Barrier-free
  - Have less red tape
  - Harmonized
  - Faster
  - More transparent
  - Too many regulations
Respondents voiced opinions on...

Things that negatively affect workplace productivity...
- Poor organizational processes
- Lack of reliable and speedy transit
- Technological distractions (e.g., cell phones, email)

Strategic opportunities identified by respondents...
- Improved transportation
- Need strong regional leadership and collaboration
- Better branding and marketing of Toronto region
- Affordable housing and infrastructure
- Decrease precarious employment and levels of immigrant unemployment
- Increase tourism
- Strengthen clusters and trade
- Improve education
- Growth and financing opportunities for small and medium enterprises (SMEs) and entrepreneurs

R&D

Innovation, measured as research & development (R&D) expenditures, are integral to increasing productivity and prosperity.

Respondents worked for companies that...
- 52% Invested in R&D in the last two years
- 47% Invested R&D in the Toronto region
- 49% Will continue to invest in R&D in the next two years

M&E

Investment in machinery and equipment (M&E) is integral for business growth and a driver of innovation.

Respondents worked for companies that...
- 45% Invested in M&E in the last two years
- 35% Invested M&E in the Toronto region
- 43% Will continue to invest in M&E in the next two years

ICT

Information and communications technology (ICT) investment is consistently lower in Ontario than in the US. ICT is important to increasing productivity and profit.

Respondents worked for companies that...
- 94% Invested in ICT in the last two years
- 86% Invested ICT in the Toronto region
- 86% Will continue to invest in ICT in the next two years
Founded in 1845, the Toronto Region Board of Trade is the chamber of commerce for Canada’s largest urban centre, connecting more than 12,000 Members and 250,000 business professionals and influencers throughout the Toronto region.

The Board fuels the economic, social and cultural vitality of the entire Toronto region by fostering powerful collaborations among business, government, thought leaders, and community builders. Toronto Region Board of Trade plays a vital role in elevating the quality of life and global competitiveness of Canada’s largest urban centre.

Membership with the Board offers the opportunity to be part of a network of our region’s most influential business leaders, who are working together to help shape the future of the Toronto region.