

MARTIN  
**Prosperity***Institute*

# Ontario's Mid-Sized Regions' performance on the 3Ts of Economic Development

**Benchmarking Project: Ontario Competes**  
Ontario in the Creative Age

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## Introduction

We have divided up the CMAs within Ontario by size, in order to benchmark them against peers of similar competitive attributes. In the province of Ontario there are five metro regions with a population between 250,000 and 500,000. Each of these regions has been classified by Statistics Canada as Census Metropolitan Areas (CMAs), they are: Kitchener, London, Oshawa, St. Catharines-Niagara and Windsor. It is important to note the diversity of the regions included in this benchmark. While Oshawa and Windsor are known for their auto manufacturing plants, London and Kitchener are home to some of Canada's top ranked universities, and compete in markets other than manufacturing. While these five regions may have similar population sizes, there are more differences between them than similarities. This means that while all of these regions are in Ontario, and do not have any size advantages (agglomeration or scales of economy), they still perform quite differently on our benchmarks; some doing well, others clearly experiencing the effects of a declining manufacturing industrial sector.

The dichotomy between these regions becomes ever more pronounced as the world in which we live is becoming spiky, with wealth and economic activities becoming highly concentrated in a small number of regions. By benchmarking, we make normative claims based on the current economic and social trends as to what assets regions should be attempting to maximize if they are to achieve economic growth. The 3Ts of economic development: Technology, Talent, or Tolerance all provide a means to judge the performance of Ontario's mid-sized regions relative to other jurisdictions and their future socio-economic prosperity. The jurisdictions chosen as the peers of this size grouping (250,000-500,000) are: Ann Arbor, MI, Canton, OH, Fort Wayne, IN, Lansing, MI, Peoria, IL, Reading, PA, Santa Barbara, CA, Spokane, WA, Tallahassee, FL and Victoria, BC. These peers were chosen based on overall competitiveness, population size and geographic diversity. All of our rankings, unless explicitly stated, are out of 15.

The 3Ts of economic development are part of a theory that gives primacy to the attraction and retention of a specific type of capital – *creative capital*. Creative capital

differs from human capital by identifying the Creative Class as key to economic growth and its focus on the underlying factors that determine their location decisions (Florida, 2002). In the creative economy, brawn and the ability to mass produce goods is subordinate to the innate human capability to generate new ideas, concepts, products and processes. The Creative Class is defined as people in occupations paid to think. Regions that attract and retain this group of workers are best positioned to succeed in the future. The global city hierarchy of the creative age will be determined not by access to natural resources, but by how and which are able to attract this class of worker. With the concentration of Talent and the multitude of perspectives that comes with people being able to carve out their own space in a new community (Tolerance), come new technologies and innovations that support continued growth (Technology). Each of the 3Ts plays an important role in the ability of regions to attract the Creative Class. As a result regions should not choose to focus on any one “T”; each is necessary but not sufficient for economic growth. In the creative age, regions will continued to be judged by their GDP per capita and other traditional measures, but it will be their overall creative output that determines their sustained success.

For more information on our terminology refer to the [Understanding our Terminology](#) section on our website. For an in depth explanation of the 3T’s see “Ontario Competes” (Martin Prosperity Institute, 2009).<sup>1</sup>

## Mid-Sized Regions: 3Ts of Economic Development

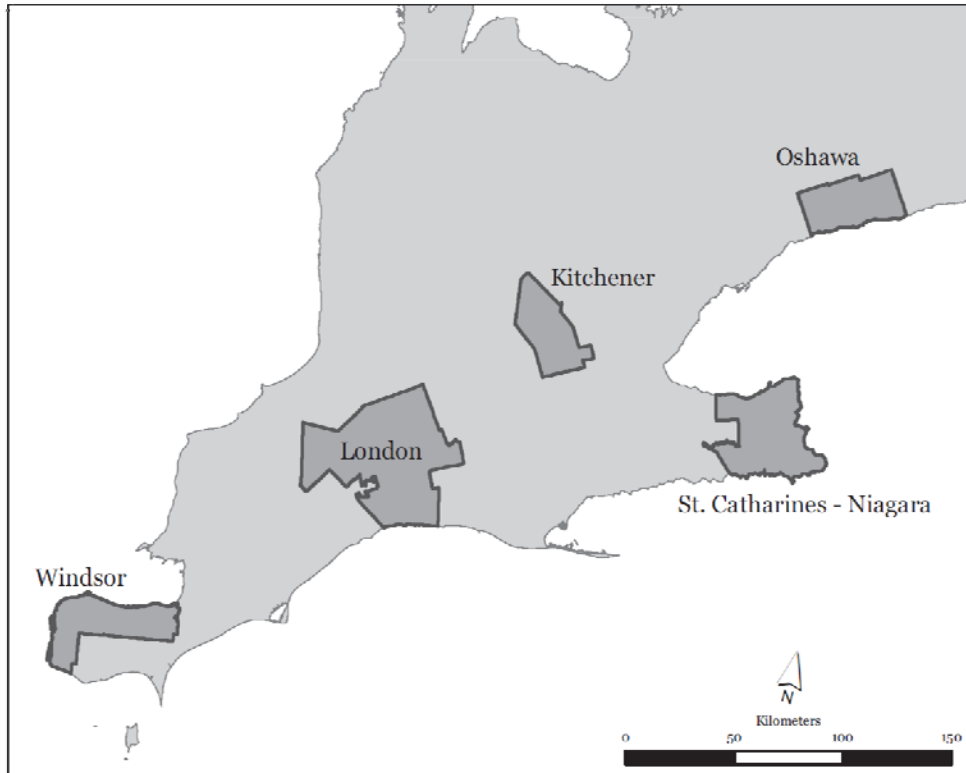
The following is a look at how these five regions are positioned relative to their peers to compete in the creative age. The 3Ts of economic development are used to gauge how Ontario’s mid-sized regions’ Technology, Talent and Tolerance assets are measuring up to their peers. The paper will begin with a look at the occupational mix of Ontario’s mid-sized regions, specifically their Creative Class. It will then look at how

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<sup>1</sup> “Ontario Competes” is the first document released as part of the Martin Prosperity Institute’s benchmarking analysis for the *Ontario in the Creative Age* project. This document acts as a primer for all subsequent benchmarking releases; therefore, we highly recommend that one read this first. Follow this path to do so: [http://martinprosperity.org/media/pdfs/Ontario\\_Competes.pdf](http://martinprosperity.org/media/pdfs/Ontario_Competes.pdf)

these regions are performing on Technology, Talent and Tolerance. The conclusion will discuss an aggregate of the 3Ts, the Creativity Index, and indicator of how Ontario's mid-sized regions are performing overall.

**Figure 1: Ontario Mid-Sized Regions (Population 250,000-500,000)**



Source: MPI. Statistics Canada, 2006

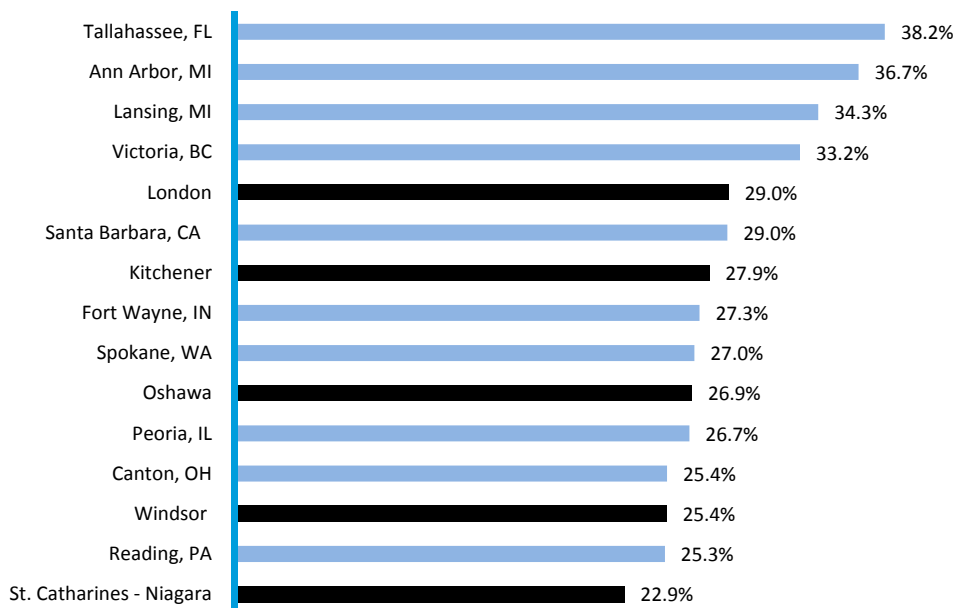
### **Ontario's Mid-Sized Regions (250,000-500,000) and the Creative Class**

As mentioned, the Creative Class is composed of people who are paid to think for a living, including people working in Technology, Arts and Culture, Professional and Education and Health (TAPE) occupations. In Ontario occupations in the Creative Class have an average total income of \$64,100 compared to an average of \$42,600 for all occupations.

The share of the workforce in the Creative Class for the 15 regions ranges from Tallahassee, FL at 38.2% to St. Catharines-Niagara at 22.9%. None of the mid-sized

Ontario CMAs perform well when ranked against their peers. London does the best with 29% of its workforce in the Creative Class. This is not surprising given that the city is home to the University of Western Ontario and a community college. These institutions would add a significant number of Creative Class jobs to the occupational mix. What is surprising is that Kitchener does not rank higher. Home to a number of innovative and technology related companies (the most well known being Research in Motion or RIM), Waterloo, a region in the Kitchener CMA, has garnered international recognition. It has also lured world class talent with the most recent example of Stephen Hawking, who was recently appointed as a research chair at the Perimeter Institute (2008).<sup>2</sup> It is clear however, that the advantages provided by the City of Waterloo are not strong enough to lift Kitchener’s Creative Class into the top five of the peer group.

**Figure 2: Ontario Mid-Sized Regions (250,000 – 500,000) and the Creative Class**



Source: MPI Analysis (2008). Statistics Canada Catalogue no. 94-581-XCB2006007. US Census Bureau, American Community Survey. (2006).

<sup>2</sup> Perimeter Institute for Theoretical Physics is an independent, resident-based research institute devoted to foundational issues in theoretical physics at the highest levels of international excellence in Waterloo, ON.

## Technology

Robert Solow, Paul Romer, and Robert Lucas among others, have shown in different ways that technology is the driving force behind economic growth (e.g. Solow, 1956; Romer, 1990). Regions cannot access the global economy (let alone compete in it) without technologies that connect and provide high speed information processing. Determining success in the creative age is not the difference between have and have not. Rather, the dichotomy that matters between highly competitive regions is that of leader and follower. First movers that introduce innovations and have well developed high-tech industrial complexes are able to reap significant benefits in the form of sustainable growth and the production of new wealth. RIM is an excellent example of this, with the Blackberry becoming a revolutionary piece of technology that is transforming both the way many businesses operate, but also how cell phone manufacturers view the device.

The Overall Technology Ranking is based on three equally weighted separate measures that reflect a region's innovativeness and the size of their high-tech producing industries. The three measures are: the North American Tech-Pole Index based on the share of employment in high-tech industries relative to the North American average, and two innovation measures: 1) total patents and 2) the year over year growth in patents for a five year period. The former is based on information from US County Business Patterns and Statistics Canada. All patent data is based on utility patent data from the United States Patent and Trade Office (USPTO). Utility patents are granted for the discovery of a process, machine, article of manufacture, or composition of matter that is new, useful and non-obvious.

Table 1 ranks the five mid-sized Ontario CMAs and their peer regions according to the composite technology index. Figures 3-5 rank the Ontario regions against their peers on the North American Tech-Pole Index, Patents per 10,000 and Patent Growth. Figures 6 and 7 show the relationship between the technology indicators and the Creative Class respectively.



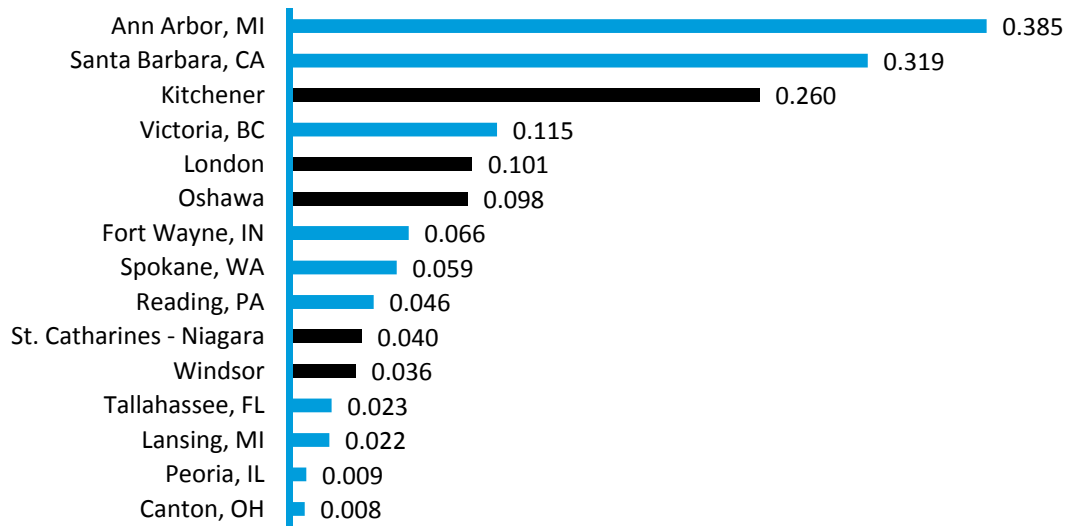
**Results:**

- The top three technology regions are Santa Barbara, Ann Arbor and Kitchener. Here we are clearly seeing Waterloo's influence on the Kitchener region. The other four CMAs do not perform particularly well on the overall ranking. Windsor ranks the highest out of these four, with a rank of 6<sup>th</sup>.
- Aside from Kitchener and St. Catharines, none of the CMAs rank in the top three on any Technology indicator. It is common for Canadian CMAs to underperform on innovation measures such as patents, and this is clearly reflected in the results below. The one area of note here is Patent Growth, where St. Catharines has 20.1% growth. Although, looking at the region's total number of patents (21), it can be seen that even small changes in this number could result in large growth percentages, thus interpreted with caution.
- Kitchener is the only region that ranks well on the North American Tech-Pole, however, both London and Oshawa rank above the median. All five of the Ontario CMAs need to improve in the area of technology if they hope to compete in the creative age.

**Table 1: Overall Technology Ranking**

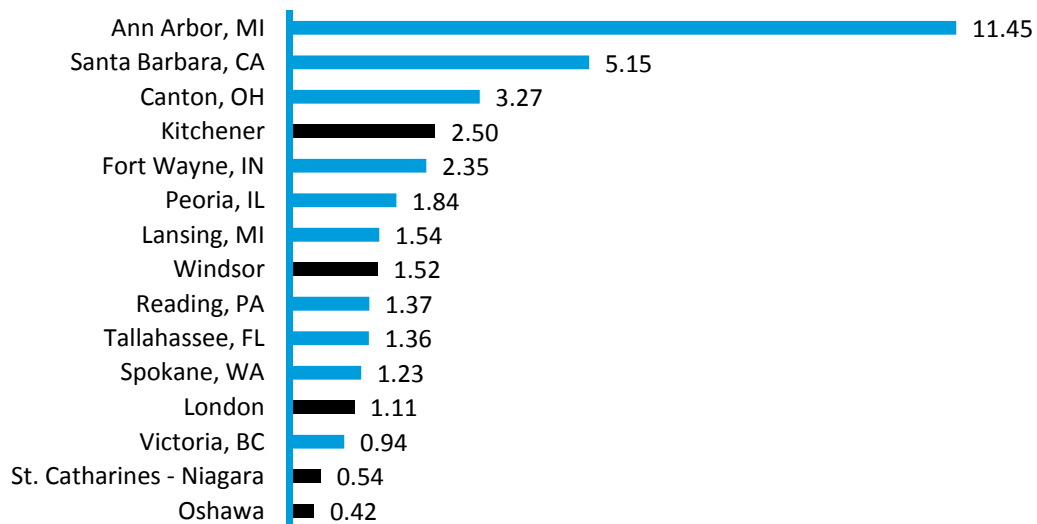
	Overall Technology Ranking	North American Tech-Pole	North American Tech-Pole Ranking	Patent Count (2006)	Patent Count Ranking	Patents per 10,000	Patents per 10,000 Ranking	Patent Growth	Patent Growth Ranking
1	Santa Barbara, CA	0.32	2	206	2	5.15	2	4.9%	6
2	Ann Arbor, MI	0.38	1	394	1	11.45	1	1.3%	10
3	Kitchener	0.26	3	113	4	2.50	4	6.8%	4
4	Victoria, BC	0.11	4	31	13	0.94	13	17.5%	2
5	Spokane, WA	0.06	8	55	8	1.23	11	3.0%	8
6	Windsor	0.04	11	49	11	1.52	8	6.5%	5
7	Tallahassee, FL	0.02	12	46	12	1.36	10	13.2%	3
8	St. Catharines - Niagara	0.04	10	21	14	0.54	14	20.1%	1
9	London	0.10	5	51	10	1.11	12	-1.1%	12
10	Canton-Massillon, OH	0.01	15	134	3	3.27	3	4.7%	7
11	Oshawa	0.10	6	14	15	0.42	15	1.3%	9
12	Lansing, MI	0.02	13	70	6	1.54	7	-0.6%	11
13	Fort Wayne, IN	0.07	7	96	5	2.35	5	-6.5%	13
14	Reading, PA	0.05	9	55	8	1.37	9	-12.7%	15
15	Peoria, IL	0.01	14	68	7	1.84	6	-9.3%	14

**Figure 3: North American Tech-Pole Index, 2006**



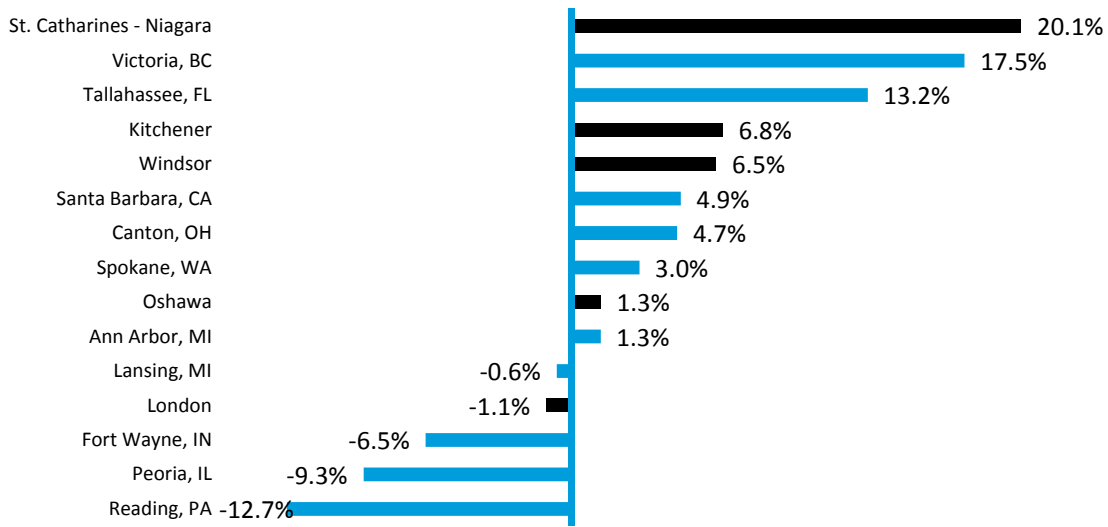
Source: MPI Analysis (2008). Statistics Canada Catalogue no. 97-559-XCB2006009. County Business Patterns, 2006

**Figure 4: Patents per 10,000, 2005**



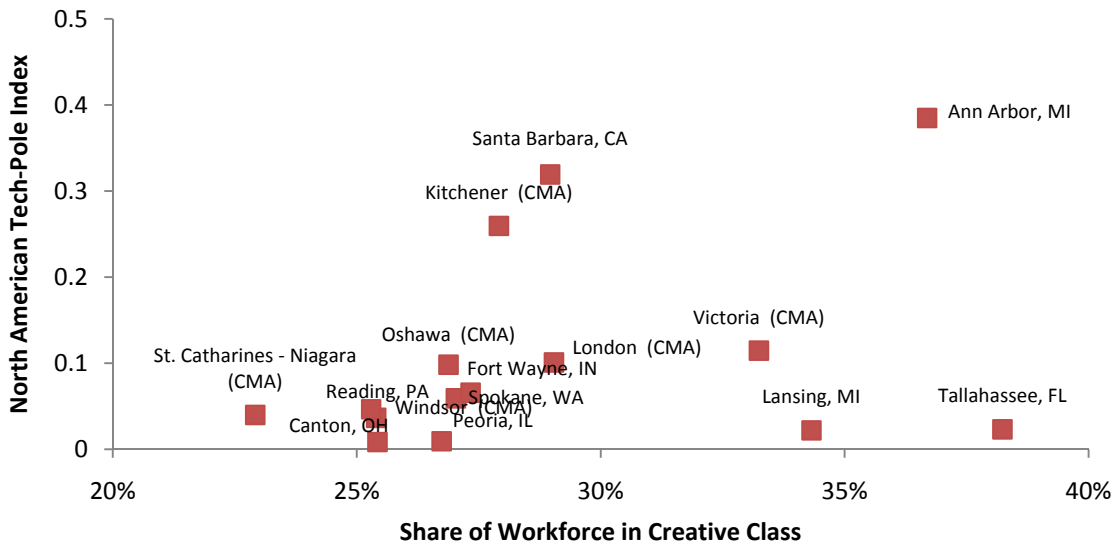
Source: MPI and Dieter Franz Kogler Analysis. USPTO (1975-07).

**Figure 5: Patent Growth, Short, 2000-2005**



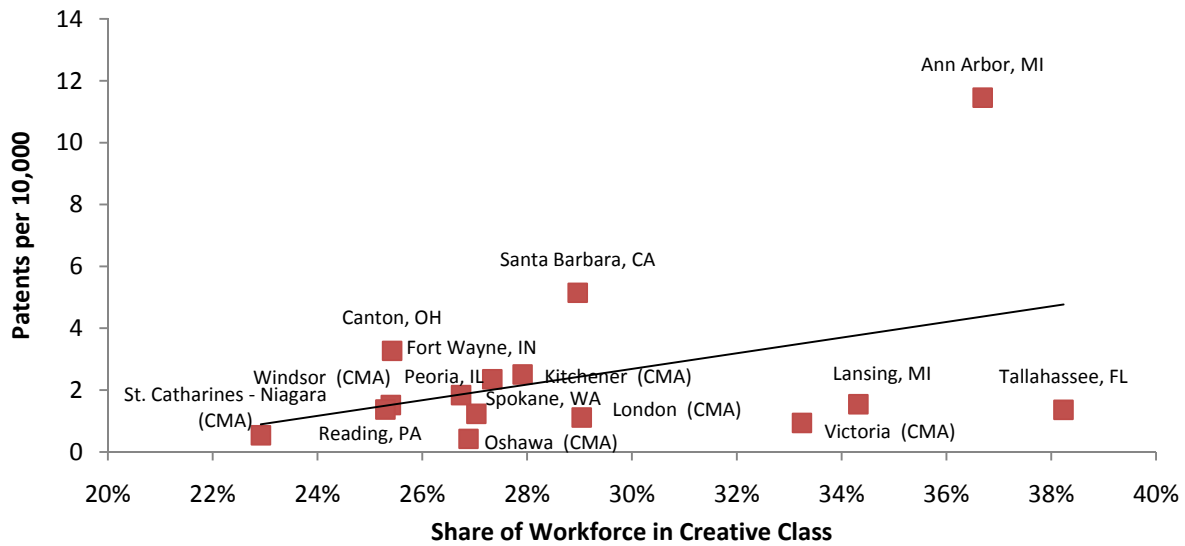
Source: MPI and Dieter Franz Kogler Analysis. USPTO (1975-07).

**Figure 6: North American Tech-Pole Index and the Creative Class**



Source: MPI Analysis (2008). Statistics Canada Catalogue no. 94-581-XCB2006007. US Census Bureau, American Community Survey. (2006). Statistics Canada Catalogue no. 97-559-XCB2006009. County Business Patterns, 2006

**Figure 7: Patents per 10,000 and the Creative Class**



Source: MPI and Dieter Franz Kogler Analysis. USPTO (1975-07). Statistics Canada Catalogue no. 94-581-XCB2006007. US Census Bureau, American Community Survey. Note:  $R^2 = 0.1709$

## Talent

The indicators that we use for Talent combine an examination of the Creative Class with other, more traditional measures of human capital. Using both an occupational measure and educational measures better captures the creative capital of a region but due to the high correlation we chose to only use the Creative Class to determine the Overall Talent Ranking. Human capital became a major theme in economics with the work of Jacob Mincer (1958), Gary Becker (1964), and most recently Ed Glaeser (2001). Their work has demonstrated the importance of investing in personal productivity as a way to generate growth for firms and regions. Due the high correlation between the Talent Index (population greater than 25 years of age with a Bachelor’s Degree or above) and the Creative Class, only the later is used to rank the peer regions on Talent in Table 2. The Creative Class reflects the ability of individuals to transfer their abilities as measured by the Talent Index into high value economic activities manifested in occupations.

The five mid-sized CMAs discussed here do not perform well on our talent indicators. There are a few exceptions, but these regions tend to rank poorly against their peers. Table 2 shows how the regions perform on the various indicators of Talent relative to their peer regions. Figures 8 and 9 visualize the information showing how the regions score on each measure. Figures 10 crosses the Talent Index with the Creative Class to show the relationship between these two indicators.

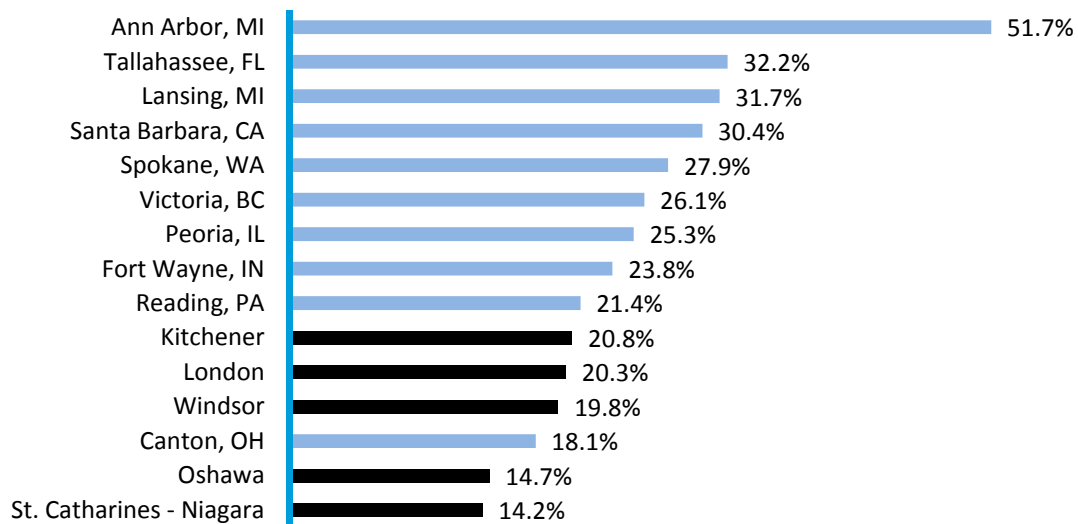
## Results

- All five of the mid-sized Ontario CMAs perform quite poorly on the Talent Index. Only two of the regions (London and Kitchener) has 20% or more of the population with at least a bachelor's degree. St. Catharines ranks 15<sup>th</sup> with only 14.2%. This will prove a major challenge for the region, as an educated workforce is one of the most important elements to be successful in today's economy.
- College towns do the best on the Talent Index, and this certainly holds true for the peers presented here. Ann Arbor is ranked first, followed closely by Tallahassee. Kitchener and London reflect this as well. Although they do not perform competitively, they do better than the other three CMAs.
- The Brain Drain/Gain Index, which is a good reflection of how well a region is attracting and retaining its talent, displays very mixed results for the five CMAs. Oshawa, with an Index of 2.02, appears to be gaining a large amount of talent, which is important for the region, as it ranks last on the Talent Index. However, Kitchener, which ranks best among the CMAs on the Talent Index ranks 15<sup>th</sup> on the Brain Drain/Gain Index. To some extent this reversal is present in all of the regions ranked here. Regions that perform well on the Talent Index have a weak Brain Drain/Gain Index score.

**Table 2: Overall Talent Ranking**

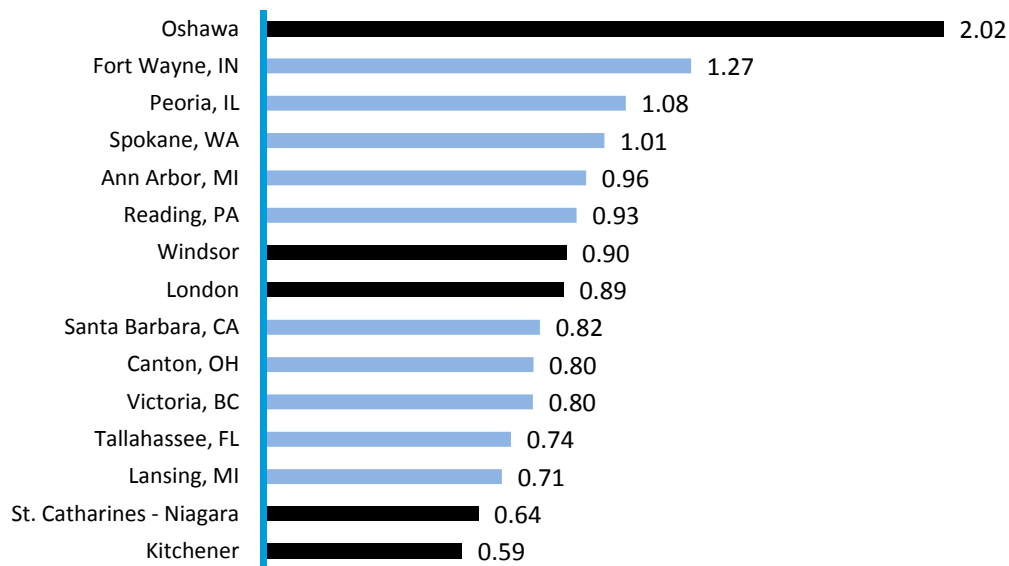
	Talent Ranking	Creative Class	Creative Class Ranking	Bachelor Degrees	Bachelor Degrees Ranking	Graduate Degrees	Graduate Degrees Ranking	Talent Index	Talent Index Ranking	Brain Drain/Brain Gain	Brain Drain/Gain Ranking
1	Tallahassee, FL	38.2%	1	19.1%	4	13.2%	2	32.2%	2	0.74	12
2	Ann Arbor, MI	36.7%	2	25.4%	1	26.2%	1	51.7%	1	0.96	5
3	Lansing, MI	34.3%	3	19.3%	2	12.4%	3	31.7%	3	0.71	13
4	Victoria, BC	33.2%	4	15.5%	8	10.9%	5	26.1%	6	0.80	11
5	London	29.0%	5	11.6%	13	9.0%	7	20.3%	11	0.89	8
6	Santa Barbara, CA	29.0%	6	19.2%	3	11.2%	4	30.4%	4	0.82	9
7	<b>Kitchener</b>	<b>27.9%</b>	<b>7</b>	<b>12.7%</b>	<b>10</b>	<b>8.3%</b>	<b>9</b>	<b>20.8%</b>	<b>10</b>	<b>0.59</b>	<b>15</b>
8	Fort Wayne, IN	27.3%	8	15.7%	7	8.1%	11	23.8%	8	1.27	2
9	Spokane, WA	27.0%	9	18.7%	5	9.2%	6	27.9%	5	1.01	4
10	<b>Oshawa</b>	<b>26.9%</b>	<b>10</b>	<b>9.9%</b>	<b>14</b>	<b>4.9%</b>	<b>15</b>	<b>14.7%</b>	<b>14</b>	<b>2.02</b>	<b>1</b>
11	Peoria, IL	26.7%	11	16.7%	6	8.6%	8	25.3%	7	1.08	3
12	Canton-Massillon, OH	25.4%	12	12.1%	11	6.0%	13	18.1%	13	0.80	10
13	<b>Windsor</b>	<b>25.4%</b>	<b>13</b>	<b>11.8%</b>	<b>12</b>	<b>8.2%</b>	<b>10</b>	<b>19.8%</b>	<b>12</b>	<b>0.90</b>	<b>7</b>
14	Reading, PA	25.3%	14	14.2%	9	7.2%	12	21.4%	9	0.93	6
15	St. Catharines - Niagara	22.9%	15	8.5%	15	5.9%	14	14.2%	15	0.64	14

**Figure 8: Talent Index (Pop > 25, BA and above), 2006**



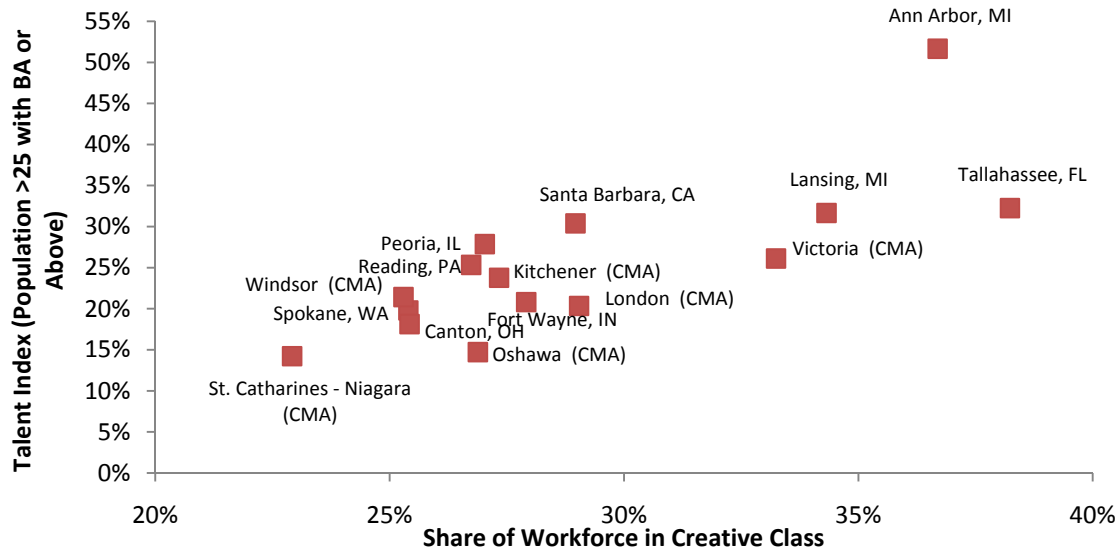
Source: MPI Analysis (2008). Statistics Canada Catalogue no. 94-581-XCB2006007. US Census Bureau, American Community Survey. (2006).

**Figure 9: Brain Drain/Gain Index, 2006**



Source: MPI Analysis (2008). Statistics Canada Catalogue no. 94-581-XCB2006007 and AUCC Enrollment numbers 2007. US Census Bureau, American Community Survey. (2006)

**Figure 10: Talent Index and Creative Class**



Source: MPI Analysis (2008). Statistics Canada Catalogue no. 94-581-XCB2006007. US Census Bureau, American Community Survey. (2006). Statistics Canada Catalogue no. 94-581-XCB2006007. US Census Bureau, American Community Survey. (2006).

## Tolerance

Tolerance is often overlooked in the study of economic development. As the 3<sup>rd</sup> 'T', Tolerance is necessary for regions to act as magnets of creative capital. The collection of Tolerance indicators is not meant to suggest that regions with high levels of gay and lesbians, bohemians, or immigrants cause economic growth. Rather these indicators go deeper to reflecting cultural elements that are difficult to capture empirically. Regions that are receptive to different types of people have a more open-minded culture, which is conducive to creativity. When regions are open to new ideas and tolerant of different views it acts as a signal to others that the creative ecosystem of the region is a place where people can be successful. The ability to tap into the rich diversity of a region is a great competitive advantage that all regions should aspire to.

The Overall Tolerance Ranking is based on four of the five measures that reflect the openness and diversity of the peer regions. The four measures are: 1) the Bohemian Index, which compares the share of regional employment in a select group of occupations against the North American share; 2) the Gay and Lesbian Index which measures the share of a region's same sex marriages relative to the North American average; 3) The Mosaic Index, or the percent of the population that is foreign born; and 4) the Integration Index, which uses neighbourhood and regional data to determine how racially mixed the peer regions are.

### Results:

- In contrast to the performance seen on Technology and Talent, the five CMAs benchmarked here perform well on Tolerance indicators. London ranks 2<sup>nd</sup> on the overall Tolerance ranking, and Kitchener and Oshawa rank 4<sup>th</sup> and 5<sup>th</sup>. While Kitchener is the only region to rank in the top three on more than one indicator, it is the consistency on all Tolerance indicators that helps the five CMAs do well overall.

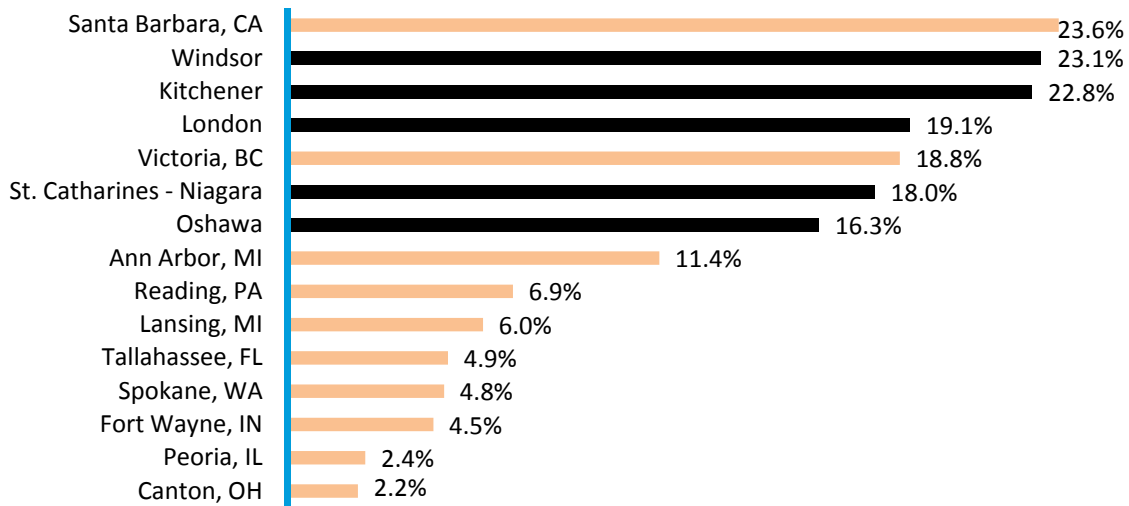


- The Mosaic Index is an indicator that Canadian CMAs often do well on because of the large number of immigrants in Canada. This holds true for these regions. Surprisingly, it is Windsor (23.1%) that does the best ranking 2<sup>nd</sup>. Kitchener (22.8%) is 3<sup>rd</sup> and London (19.1%) is 4<sup>th</sup>.
- The Integration Index is important as it tells us how well cultures are integrating within a region. An impressive score on the Visible Minority Index can be diminished with a low Integration Index score. As this would lead one to believe that although there are lots of races and cultures within a region, they have trouble integrating and thus there are certain barriers causing this. However, most of the CMAs do well on the Integration Index. Only Windsor (0.71) is below the median, ranked 10<sup>th</sup>.
- The Bohemian Index and the Gay and Lesbian Index are two indicators that signal tolerance and low barriers to entry. Performance on the Gay and Lesbian Index is mixed among the five Canadian CMAs, but on the Bohemian Index they all perform well. Therefore it seems that regions in this size range while tolerant of different lifestyles tend to attract bohemians but not Gay and Lesbian couples. This may be due to lower rents attracting bohemians (artists, actors, performers) while cities like Toronto are a more attractive option for Gay and Lesbian couples due to its large established community in the downtown core. Figures 11-15 show how the five mid-sized regions do on our Tolerance indicators. Figures 16 and 17 compare the Bohemian Index and the Gay and Lesbian Index to the Creative Class.

**Table 3: Overall Tolerance Ranking**

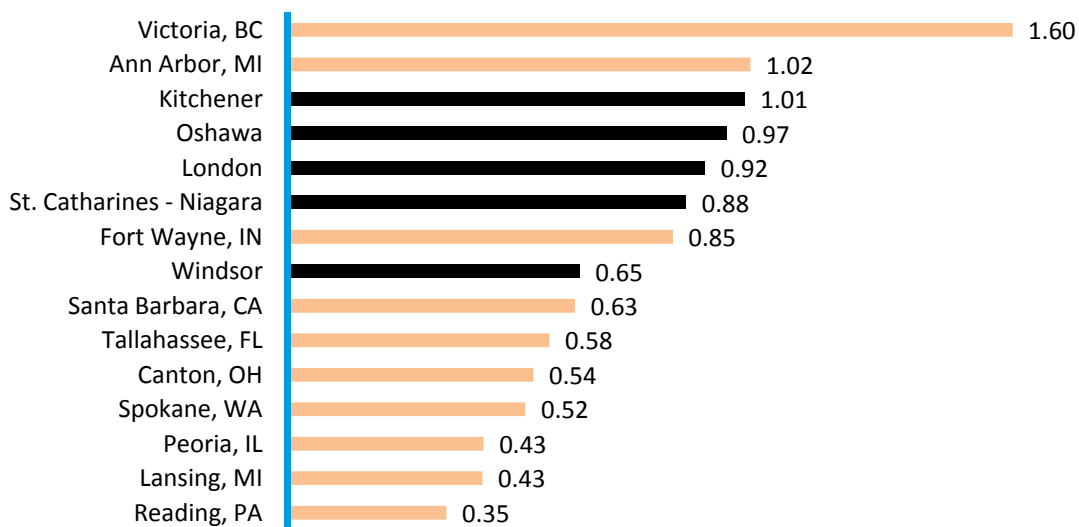
	Tolerance Ranking	Mosaic Index	Mosaic Index Ranking	Integration Index	Integration Index Ranking	Bohemian Index	Bohemian Index Ranking	Gay and Lesbian Index	Gay and Lesbian Index Ranking	Visible Minorities	Visible Minorities Ranking
1	Victoria	18.8%	5	0.80	5	1.60	1	1.62	1	10.3%	11
2	London	19.1%	4	0.78	6	0.92	5	1.10	4	11.0%	10
3	Ann Arbor, MI	11.4%	8	0.65	13	1.02	2	1.29	2	24.2%	2
4	Kitchener	22.8%	3	0.77	7	1.01	3	0.78	8	13.6%	8
5	Oshawa	16.3%	7	0.81	4	0.97	4	0.73	10	10.2%	12
6	Santa Barbara, CA	23.6%	1	0.54	15	0.63	9	1.15	3	22.2%	3
7	St. Catharines - Niagara	18.0%	6	0.84	2	0.88	6	0.63	13	6.5%	15
8	Spokane, WA	4.8%	12	0.90	1	0.52	12	0.85	7	9.2%	14
9	Windsor	23.1%	2	0.71	10	0.65	8	0.67	12	15.8%	6
10	Lansing, MI	6.0%	10	0.71	9	0.43	14	0.95	6	15.9%	4
11	Tallahassee, FL	4.9%	11	0.57	14	0.58	10	0.97	5	37.7%	1
12	Fort Wayne, IN	4.5%	13	0.68	11	0.85	7	0.75	9	15.8%	5
13	Reading, PA	6.9%	9	0.67	12	0.35	15	0.71	11	15.1%	7
14	Canton, OH	2.2%	15	0.82	3	0.54	11	0.59	15	9.7%	13
15	Peoria, IL	2.4%	14	0.73	8	0.43	13	0.62	14	12.9%	9

**Figure 11: Mosaic Index (% Pop), Ontario Regions (250,000-500,000) and Peer Regions, 2006**



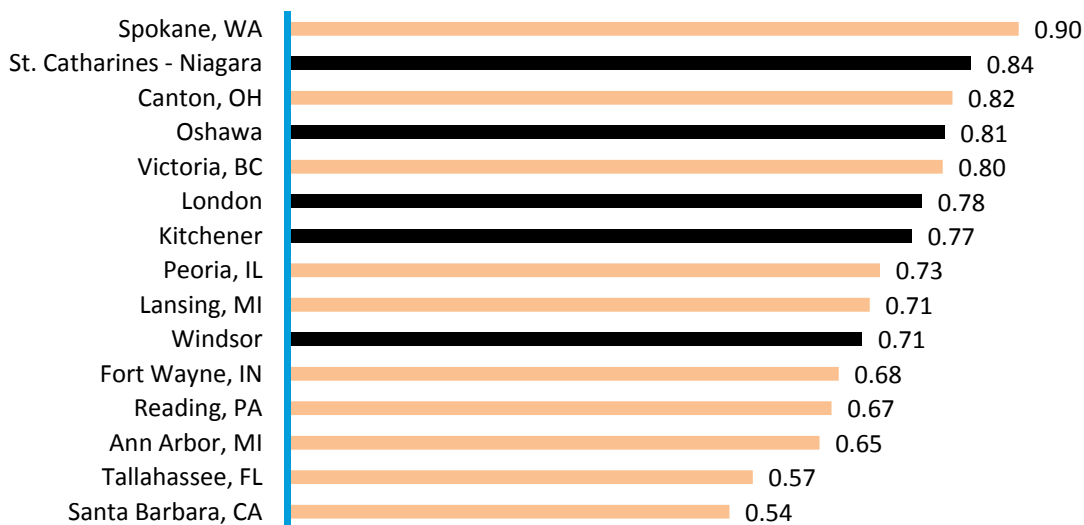
Source: MPI Analysis (2008). Statistics Canada Catalogue no. 94-581-XCB2006007. US Census Bureau, American Community Survey. (2006).

**Figure 12: Bohemian Index, Ontario Regions (250,000-500,000) and Peer Regions, 2006**



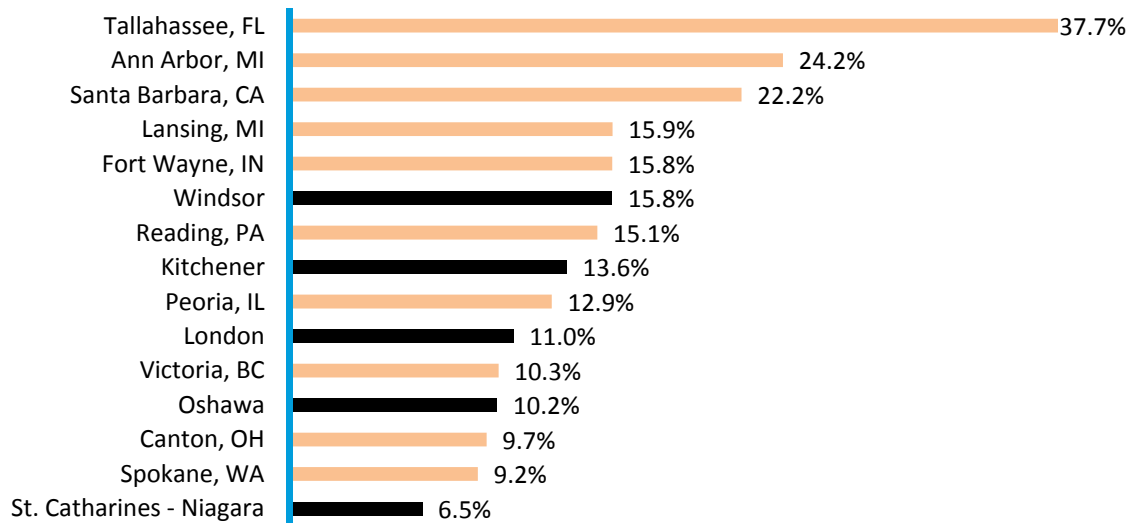
Source: MPI Analysis (2008). Statistics Canada Catalogue no. 97-559-XCB2006011 and 97-F0012-XCB-01049. US, County Business Patterns, 2006

**Figure 11: Integration Index, Ontario Regions (250,000-500,000) and Peer Regions, 2006**



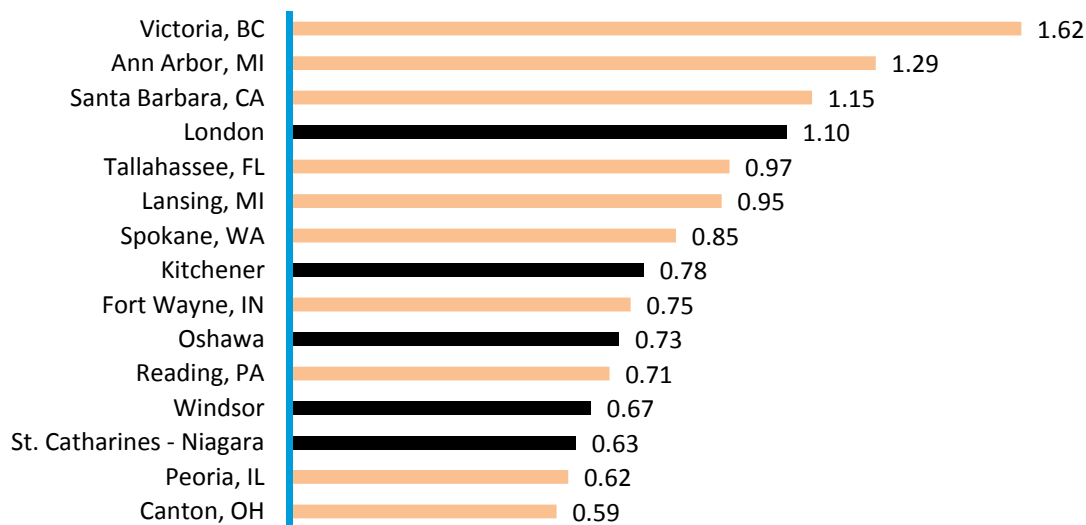
Source: Statistics Canada Catalogue no. 94-581-XCB2006007 and 94-580-XCB2006005. US Census Bureau, American Community Survey. (2006).

**Figure 14: Visible Minorities (% Pop), Ontario Regions (250,000-500,000) and Peer Regions, 2006**



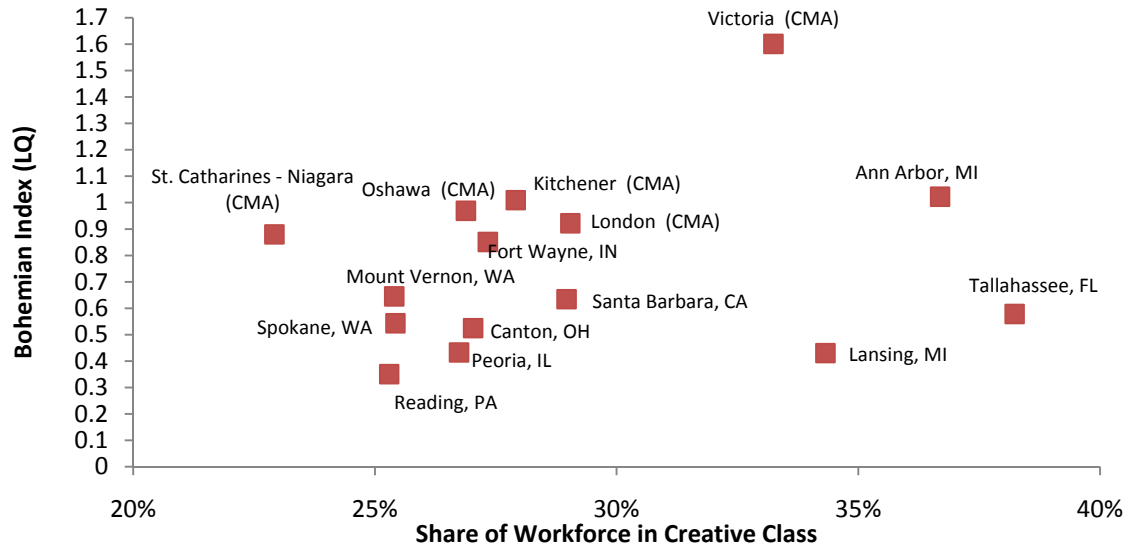
Source: MPI Analysis (2008). Statistics Canada Catalogue no. 94-581-XCB2006007. US Census Bureau, American Community Survey. (2006).

**Figure 1512: Gay and Lesbian Index, Ontario Regions (250,000-500,000) and Peer Regions, 2006**



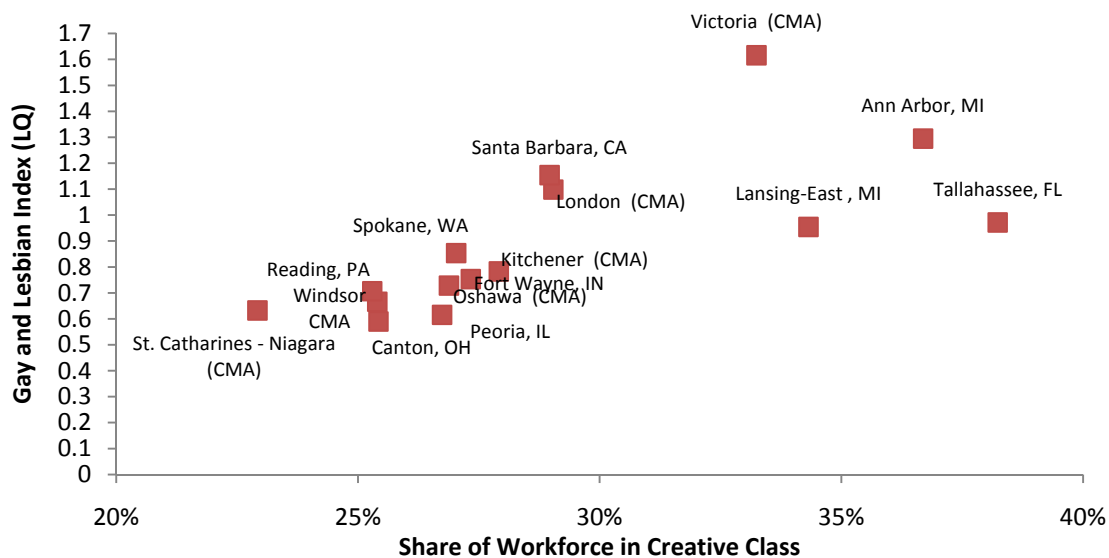
Source: MPI Analysis (2008). Statistics Canada Catalogue no. 97-553-XWE2006002 and 97-552-XCB2006007. US Census (2006).

**Figure 16: Bohemian Index and the Creative Class**



Source: MPI Analysis (2008). Statistics Canada Catalogue no. 97-559-XCB2006011 and 97-F0012-XCB-01049. US, County Business Patterns, 2006. Statistics Canada Catalogue no. 94-581-XCB2006007. US Census Bureau, American Community Survey. (2006).

**Figure 17: Gay and Lesbian Index and the Creative Class**



Source: MPI Analysis (2008). Statistics Canada Catalogue no. 97-553-XWE2006002 and 97-552-XCB2006007. US Census (2006). Statistics Canada Catalogue no. 94-581-XCB2006007. US Census Bureau, American Community Survey. (2006).

## Conclusions for Ontario's Mid-Sized Regions

The five CMAs in Ontario with populations between 250,000 and 500,000 perform quite poorly on our benchmarks. Tolerance is the only 'T' where the regions performed well, and even on these indicators there was no clear sign of a leader. There were notable points, but on the whole, these CMAs will need to improve in many areas to be competitive in the future.

- Only London and Kitchener rank above the median, but neither are within the top three of the peer regions on the Creativity Index.
- Oshawa, Windsor, and St. Catharines all lag significantly. Each ranks below the median among the peers, and among all North American Metro regions they rank 140<sup>th</sup>, 165<sup>th</sup> and 185<sup>th</sup> respectively.

**Table 4: Creativity Index**

	Creativity Index Ranking	Creativity Index	Technology Ranking	Talent Ranking	Tolerance Ranking
1	Ann Arbor, MI	0.83	2	2	3
2	Victoria, BC	0.83	4	4	1
3	Tallahassee, FL	0.70	7	1	11
4	Santa Barbara, CA	0.70	1	6	6
5	<b>London</b>	<b>0.68</b>	<b>9</b>	<b>5</b>	<b>2</b>
6	<b>Kitchener</b>	<b>0.69</b>	<b>3</b>	<b>7</b>	<b>4</b>
7	Lansing, MI	0.67	12	3	10
8	Spokane, WA	0.57	5	9	8
9	<b>Oshawa</b>	<b>0.56</b>	<b>11</b>	<b>10</b>	<b>5</b>
10	<b>Windsor</b>	<b>0.52</b>	<b>6</b>	<b>13</b>	<b>9</b>
11	Fort Wayne, IN	0.50	13	8	12
12	<b>St. Catharines - Niagara</b>	<b>0.48</b>	<b>8</b>	<b>15</b>	<b>7</b>
13	Canton, OH	0.44	10	12	14
14	Reading, PA	0.39	14	14	13
15	Peoria, IL	0.36	15	11	15

Ontario CMAs (population 250,000-500,000) are clearly lagging behind their peer regions. They are not just lagging behind the American regions either; Victoria, BC was quite competitive overall, ranking 2<sup>nd</sup> on the Creativity Index and above 4<sup>th</sup> or higher on Technology, Talent and Tolerance. Ontario's mid-sized regions need to improve their or they will quickly be left behind in the creative age. It is not unfair to say that we are seeing the early effects of this, with large numbers of manufacturing jobs being lost and companies shutting their doors. However, this problem is not isolated to industrial towns, as neither London nor Kitchener are overly competitive relative to their peers. Talent seems to be the biggest concern for these regions. Only Oshawa displayed an impressive Brain Gain, and given the overall poor rankings on the Talent Index and the Creative Class, it will be hard for these regions to be competitive in tomorrow's economy.

## Appendix A: Metric Definitions for Ontario Project Benchmarking

Summary Statistics	
Population	Population Counts from ACS and Statistics Canada, 2006
Median Age	Median Age from ACS and Statistics Canada, 2006
Overall Cost of Living Index	Composite measure that uses CPI data from both the US and Canada.

Overall Statistics	
Population Growth (2000-2005)	$(\text{Population}(2005) - \text{Population}(2000)) / \text{Population}(2000)$
Job Growth (2000-2005)	$(\text{Labor Force, Total Employment}(2005) - \text{Labor Force, Total Employment}(2000)) / \text{Labor Force, Total Employment}(2000)$
GDP per Capita, 2006	GDP/Population, PPP adjusted. Canadian GDP numbers are calculated based on the relationship between the Bureau of Economic Analysis regional GDP numbers and average total income.
Change in Average Wage (2000-2005)	$(\text{Average Wage}(2005) - \text{Average Wage}(2000)) / \text{Average Wage}(2000)$
Creativity Index	State and Province: Technology (North American Tech Pole, Patent Growth (00-05) and Total Patents, Tolerance (Bohemian Index, Integration Index, Gay Index and Mosaic Index), Talent (Creative Class) each account for 1/3 of index

Technology Measures	
Total Patents, 2005	Total number of patents issued to primary inventors in region 2005; US Patent & Trademark Office (USPTO)
Patents per 10,000, 2005	Total patents issued per 10,000 residents 2005; USPTO & U.S. Census
Patent Growth, Short Term (00-05)	Average annual growth in number of patents issued 2000-2005; USPTO
North American High Tech LQ, 2006	A location quotient captures the difference between a specific regions concentration of a characteristic and the average concentration across the entire country or larger regions. The high tech LQ measures the concentration of high technology among employment for a region against the concentration of high technology among employment for the US and Canada combined.
North American Tech Pole Index	Combination of two factors (1) the share of a region's employment that is high-tech and (2) the high tech location quotient (below) for U.S and Canada combined. High Tech includes software, electronics, biomedical products, and engineering

Talent Measures	
Creative Class, 2006	Percentage of the employed population in the region in the Super Creative occupations (see below) or occupations in the following categories: Management, Business/Finance, Law, Healthcare (does not include Healthcare support)
Super Creative Core, 2006	Percentage of the employed population in the region in occupations in the following categories: Computers, Architecture/Engineering, Science, Education, Arts and Design
Pop > 25, Above High School Below BA, 2006	Percentage of the population aged 25 and above in the region that has a high school diploma or equivalent and Percentage of the population aged 25 and above in the region that has a college certificate (associate's degree for U.S.)
Talent Index (Pop >25, BA and Above)	Percentage of the population aged 25 and above with a bachelor's degree or higher
Graduate and/or Professional Degree	Percentage of population aged 25 and above with a graduate and or professional degree
Brain Gain/ Brain Drain Index	Percentage of the population, age 25 and above, with at least a bachelor's degree divided by the percentage of the population age 18 to 34 currently attending university

Tolerance Measures (Inclusiveness)	
Visible Minorities (% Pop)	Percentage of Non-white population
Mosaic Index (% Pop)	Percent of population that is foreign born
Gay and Lesbian Index	Location quotient that is the ratio of same sex unmarried partners to total partners in the region over same sex unmarried partners to total partners for the entire U.S. (from 2000); Census
Bohemian Index	Bohemian Index; Location quotient that measures whether a region has more or fewer professional artistically creative people than the average region 2006; estimated from Census, ACS
Integration Index	$\text{Integration Index} = 1 - \left( \frac{\text{Total Visible Minority}_{region}}{\text{Total Population}_{region}} \right) \sum \left  \frac{V_{GroupDA,G}}{V_{GroupG}} - \frac{V_{GroupDA,H}}{V_{GroupH}} \right $ <p>Where VGroupDA,G is the population of group G in the dissemination area .                      And where VGroupDA,H is the population of group H in the dissemination area                      Where VGroupG is the total population of group G in the CMA.                      Where VGroupH is the total population in group H in the CMA.                      The integrations index measure the degree to which a cities visible minority population is intermixed with non-visible minorities.</p>



## Appendix B: High-Tech Industries – NAICS

Computer systems design and related services
Architectural, engineering and related services
Other professional, scientific and technical services
Wired telecommunications carriers
Scientific research and development services
Motion picture and video industries
Pharmaceutical and medicine manufacturing
Aerospace product and parts manufacturing
Semiconductor and other electronic component manufacturing
Communications equipment manufacturing
Navigational, measuring, medical and control instruments manufacturing
Wireless telecommunications carriers (except satellite)
Software publishers
Medical equipment and supplies manufacturing
Computer and peripheral equipment manufacturing
Internet service providers, web search portals
Telecommunications resellers

## Appendix C: Research Methods

The process of benchmarking the Province of Ontario and its 15 Census Metropolitan Areas (CMAs) against peer regions in both the United States and Canada was conducted as part of the *Ontario in the Creative Age* project commissioned by the government of Ontario. In order to better understand the competitiveness of Ontario and its CMAs we conducted a quantitative analysis of North America by collecting data from national statistical agencies on over 30 different indicators that have been shown to influence regional economic prosperity. These collections of indicators developed by Florida (2002) are representative of the 3Ts of economic development (Technology, Talent and Tolerance) and are part of his larger Creative Class theory.

In selecting the North American regions for the benchmarking, the main determinate of peers for Ontario's CMAs was population. Population is a highly important variable to control for because each of the following factors is size and density dependent: the division of labour, economies of scope, agglomeration and scale. In total we compared the province to 20 peer states and provinces, selecting sub-national regions with a population of 6 million or more (17 states) and the 3 largest provinces (Quebec, British Columbia and Alberta). For the CMAs which range from Toronto with a population of 5.1 million to Peterborough with just under 120,000 people, we subdivided the 15 regions into five class categories (Population >2 million, 1-2 million, 0.5-1 million, 250,000-500,000 and 100,000-250,000) for which 10 peer regions having a similar population were selected. In total 50 peer regions were selected from the 20 peer states and provinces.

The indicators used to inform this report were based on previous research conducted by Richard Florida (2002) which showed that Technology, Talent, and Tolerance are key elements for the success and continued development of a region. A region needs substantial but balanced performance across ALL of the "Three Ts" to grow and be prosperous.

In order to maintain objectivity, the analysis involved in this benchmarking process was entirely quantitative. This may lead to results that seem odd when discussed out of context or by an individual with specific regional knowledge. For example, our analysis found that Ottawa-Gatineau is incredibly competitive on certain occupation measures which are a result of the large federal government presence in the CMA. When viewing the results it is important to remember that they have not been informed by specific knowledge that is local to the regions.

## Works Cited

Unspecified author (2008). Stephen Hawking coming to Waterloo, Ont.'s Perimeter Institute. National Post. Toronto.

Becker, G. S. (1964). Human Capital: A theoretical and empirical analysis with special reference to education. New York, National Bureau of Economic Research.

Florida, R. (2002). Rise of the Creative Class. New York: Basic Books.

Glaeser, E. L. and D. C. Mare, "Cities and skills," Journal of Labor Economics 19, no. 2 (2001): 316-342.

Institute for Competitiveness and Prosperity. (2004). Re-inventing innovation and commercialization policy in Ontario. Ontario Regions: Institute for Competitiveness and Prosperity.

Martin Prosperity Institute. (2009). Ontario Competes: Performance overview using the 3Ts of economic development. Toronto: Martin Prosperity Institute.

Mincer, J "Investment in Human Capital and Personal Income Distribution," The Journal of Political Economy 66, no. 4 (August 1958): 281-302.

Romer, P. M., (1990), "Endogenous Technological Change", Journal of Political Economy, 98/5: S71-102

Solow, Robert M. (1956), "A Contribution to the Theory of Economic Growth", Quarterly Journal of Economics, 70:65-94.

## Research Team

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## Benchmarking Project

This paper is part of the *Ontario in the Creative Age* series, a project we are conducting for the Ontario Government. The project was first announced in the 2008 Ontario Budget Speech, and its purpose is to understand the changing composition of Ontario's economy and workforce, examine historical changes and projected future trends affecting Ontario, and provide recommendations to the Province for ensuring that Ontario's economy and people remain globally competitive and prosperous.

The purpose of the benchmarking papers in this series was to gather and analyze data on Ontario's CMAs and assess how well they compete with similar jurisdictions across North America our 3Ts of Economic Development. The assessments are intended to inform a constructive discussion on what factors contribute to regional economic development. They are not intended to be all encompassing.

## Disclaimer

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Any omissions or errors remain the sole responsibility of the research team. Any comments or questions regarding the content of this report may be directed to [info@martinprosperity.org](mailto:info@martinprosperity.org).