Creative Class Workers in Waterloo Region

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Workforce Planning Board
of Waterloo Wellington Dufferin

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Executive Summary

The creative class is a socio-economic class identified as the key driving force for economic development of post-industrial cities.

In 2009, the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) developed a tool which provides information on occupational categories based on the framework of Dr. Richard Florida. The Workforce Planning Board of Waterloo Wellington Dufferin approached OMAFRA to partner on a pilot project using the tool in conjunction with custom industry and employment data available to planning board's across Ontario. This pilot project would showcase how using both sets of data together could significantly increase our understanding of the impact of the creative class at the local level.

The first part of this project provides this research report which can be used by the Workforce Planning Board's local economic development partners in Waterloo Region to support the development of economic development and retention strategies. The second phase will provide a "How-To" template to our local board colleagues across Ontario which will allow them to develop similar reports for their own areas in partnership with their local economic development offices.

Creative class employment was examined in terms of location of work, local representation, and concentration by industry. Opportunities in growth industries for creative class workers in declining industries were also identified.

Data was sourced from the 2001 and 2006 census for Waterloo Region, which consists of the cities of Cambridge, Kitchener, and Waterloo, and the townships of North Dumfries, Wellesley, Wilmot, and Woolwich. Similar data for Ontario was sourced as a benchmark when useful. Industries were examined at the 3-digit level of the North American Industry Classification System (NAICS).

The creative class is comprised of knowledge workers, intellectuals and various types of artists. This class is slightly less prominent in Waterloo Region as it represents 31% of total employment locally compared to 34% of total employment in Ontario. The employment growth rate of the creative class has been higher in Waterloo Region than Ontario, and in both geographies it has grown faster than the average of all occupations.

There is a net surplus of inward commuters to the area working in Computer and mathematical occupations, Business and financial operations occupations, and Education, training, and library occupations. There is a net surplus of outward commuters from the area working in Architecture and engineering occupations, Life, physical, and social science occupations, and Arts, design, entertainment, sports, and media occupations. More people are commuting out of Waterloo Region every day to work than are coming in.

Waterloo Region is highly concentrated in 28 creative class occupations, of which the most fall within Natural and applied science occupations. Five industries in Waterloo Region each employ over 3,000 creative class workers: Educational services, Professional, scientific and technical services, Insurance carriers and related activities, Ambulatory health care services, and Hospitals. Creative class occupations are particularly low in Manufacturing, Construction, and Transportation and warehousing.

Among declining industries in Waterloo Region, the top seven were within Manufacturing. A positive finding is that most of the prevalent creative class occupations in declining industries are equally or more prevalent in at least one growth industry.

1 Overview of Workers by Class

Dr. Richard Florida's framework examines labour markets by classes: Working, Service, and Creative (and its super-creative core). Together with the primary industries of fishing, farming, and forestry, all working people in a given economy are represented.

On a North-American scale, the working class has steadily declined over the past 60 years, while fishing, farming, and forestry have declined greatly for over a century. The service class has been the largest class for 50 years and continues to be nearly 15% larger than any other class. The creative class and its super-creative core each grew gently until 1970 when their employment growth accelerated.

Employment growth both provincially and in Waterloo Region continues to be led by the large service class. However, the growth rate of the creative class has been well above average and examined on its own, the super-creative core of the creative class had a higher growth rate than any class both provincially and locally. The creative class represents 31% of total employment in Waterloo Region and 34% of total employment in Ontario.

WORKERS BY CLASS, 2006

		Share of Workforce		Growth Rate 2001 to 2006	
	Workers in Waterloo Region	Waterloo Region	Ontario	Waterloo Region	Ontario
Total All Occupations	**238,465**			**12%**	**6%**
Creative Class	74,115	31%	34%	14%	8%
Super Creative Core	39,325	17%	17%	23%	12%
Service Class	100,900	42%	45%	16%	9%
Working Class	59,210	25%	18%	3%	-2%
Fishing/Farming/Forestry	4,255	2%	2%	1%	-5%

2 Defining the Creative Class

The Creative Class* is comprised of:

Creative Professionals

These professionals are classic knowledge-based workers. They draw on complex bodies of knowledge to solve specific problems, using high degrees of education to do so. They include:

- Management occupations
- Business and financial operations occupations
- Legal occupations
- Healthcare practitioners and technical occupations
- High-end sales and sales management

Super-Creative Core

Those belonging to this group fully engage in creative and innovative processes. Along with problem solving, their work may entail problem finding. They include:

- Computer and mathematical occupations
- Architecture and engineering occupations
- Life, physical, and social science occupations
- Education, training, and library occupations
- Arts, design, entertainment, sports, and media occupations

*See Appendix for a complete list of creative class occupations.

3 Workforce by Place of Work Compared to Place of Residence

A large majority of Waterloo Region's workforce both lives and works within the region. However, as daily commuting in and out of the region occurs, two subtly different workforces can be recognized by an imbalance of which occupations these commuters work in. The composition of the workforce by place of work compared to the workforce by place of residence reveals different concentrations of certain occupational groups. The following table examines these differences within the creative class occupations.

For example, there are more people who work in Computer and mathematical occupations commuting ***into*** the region to work than there are commuting ***out***. Within this occupational group, there is an especially high net number of inward commuters who work as Computer programmers and interactive media developers, Information systems analysts and consultants, User support technicians, and Software engineers. Conversely there are more people who work in Architecture and engineering occupations commuting ***out*** of the region to work than there are commuting ***in***.

RELATIVELY CONCENTRATED CREATIVE CLASS OCCUPATIONS BY WORKFORCE
Waterloo Region

Place of Work
(net surplus of inward commuters)

Computer and Mathematical Occupations

led by...
- Computer Programmers and Interactive Media Developers
- Information Systems Analysts and Consultants
- User Support Technicians
- Software Engineers

Business and Financial Operations Occupations

led by...
- Insurance Adjusters and Claims Examiners
- Insurance Underwriters

Education, Training, and Library Occupations

led by...
- University Professors, Post-Secondary Teaching and Research Assistants

Place of Residence
(net surplus of outward commuters)

Architecture and Engineering Occupations

led by...
- Industrial and Manufacturing Engineers
- Electronic Service Technicians (household and business equipment)
- Air Pilots, Flight Engineers and Flying Instructors
- Industrial Engineering and Manufacturing Technologists and Technicians

Life, Physical, and Social Science Occupations

led by...
- Family, marriage and other related counselors
- Chemists

Arts, Design, Entertainment, Sports, and Media Occupations

led by...
- Musicians and Singers

4 Concentration of Local Creative Class Workers

Measuring the concentration level of an occupation in Waterloo Region compared to the concentration level in Ontario produces a location quotient. This quotient indicates the Region's areas of specialization, as well as possible shortages.

$$\text{Location Quotient} = \frac{\text{\% of local employment in an occupation}}{\text{\% of provincial employment in an occupation}}$$

A location quotient of 1.00 would mean that the occupation is equally concentrated in this Region as it is at the provincial level.

If a location quotient is ***greater*** than 1.25, the occupation is highly concentrated in the local workforce.

If a location quotient is ***less*** than .75, the occupation may be under-represented in the local workforce.

In Waterloo Region, the most heavily concentrated creative class occupation compared to the provincial average is systems testing technicians. They are over 2.5 times as heavily concentrated in this area as they are in Ontario. In this area, the greatest numbers of these workers are found in Computer systems design and related services, Insurance carriers, and Communications equipment manufacturing.

University professors, Sports officials and referees, Insurance underwriters, Insurance adjusters and claims examiners, and Post-secondary teaching and research assistants are each over twice as heavily concentrated in this region as they are in Ontario.

In total there are 28 creative class occupations that are of high local concentration compared to Ontario. Grouped by their wider occupational groups, the breakdown is as follows:

- 13 Natural and Applied Science Occupations
- 5 Health Occupations
- 3 Social Science, Education, Government Service and Religion Occupations
- 3 Arts, Culture, Recreation and Sports Occupations
- 2 Management Occupations
- 2 Business, Finance and Administrative Occupations.

There are many more creative class occupations that are of low local concentration compared to Ontario. Most are of expectably low concentration because the area's industrial composition doesn't support their employment, however certain occupations may be essential to any workforce and may be under-represented.

HIGH LOCATION QUOTIENTS
Creative Class Occupations-Waterloo Region
(*Super-Creative Core)

Creative Class Occupation (with NOC[1] Code)		Location Quotient
*2283	Systems testing technicians	2.75
*4121	University professors	2.38
*5253	Sports officials and referees	2.13
1234	Insurance underwriters	2.09
1233	Insurance adjusters and claims examiners	2.08
*4122	Post-secondary teaching and research assistants	2.04
3123	Other professional occupations in health diagnosing and treating	1.90
3235	Other technical occupations in therapy and assessment	1.74
*2233	Industrial engineering and manufacturing technologists and technicians	1.59
*2141	Industrial and manufacturing engineers	1.57
*2173	Software engineers	1.57
*2234	Construction estimators	1.53
*2115	Other professional occupations in physical sciences	1.48
0121	Insurance, real estate and financial brokerage managers	1.47
*4143	Educational counsellors	1.45
0211	Engineering managers	1.44
*5134	Dancers	1.44
*2154	Land surveyors	1.43
*5223	Graphic arts technicians	1.42
*2153	Urban and land use planners	1.40
*2133	Electrical and electronics engineers	1.38
3121	Optometrists	1.37
3114	Veterinarians	1.36
*2174	Computer programmers and interactive media developers	1.35
*2232	Mechanical engineering technologists and technicians	1.34
3216	Medical sonographers	1.34
*2253	Drafting technologists and technicians	1.33
*2241	Electrical and electronics engineering technologists and technicians	1.27

Interpretation example:

- For every one Systems testing technician per capita in Ontario, there are 2.75 Systems testing technicians per capita in Waterloo Region.

[1] National Occupation Classification

LOW LOCATION QUOTIENTS
Creative Class Occupations-Waterloo Region
(*Super-Creative Core)

Creative Class Occupation (with NOC Code)		Location Quotient
* 4162	Economists and economic policy researchers and analysts	0.14
* 4168	Program officers unique to government	0.15
* 2255	Mapping and related technologists and technicians	0.18
* 2271	Air pilots, flight engineers and flying instructors	0.18
* 2244	Aircraft instrument, electrical and avionics mechanics, technicians and inspectors	0.19
0411	Government managers, health and social policy development and program administration	0.20
* 2223	Forestry technologists and technicians	0.23
* 2143	Mining engineers	0.27
* 2262	Engineering inspectors and regulatory officers	0.30
* 5135	Actors and comedians	0.30
* 5123	Journalists	0.31
* 5224	Broadcast technicians	0.31
0012	Senior government managers and officials	0.32
* 5227	Support occupations in motion pictures, broadcasting and the performing arts	0.34
* 2146	Aerospace engineers	0.35
* 5131	Producers, directors, choreographers and related occupations	0.35
* 2151	Architects	0.36
0412	Government managers, economic analysis, policy development and program administration	0.39
* 5122	Editors	0.39
* 5125	Translators, terminologists and interpreters	0.39
* 5222	Film and video camera operators	0.39
* 5243	Theatre, fashion, exhibit and other creative designers	0.39
* 4165	Health policy researchers, consultants and program officers	0.40
1113	Securities agents, investment dealers and brokers	0.41
0512	Managers, publishing, motion pictures, broadcasting and performing arts	0.42
* 2123	Agricultural representatives, consultants and specialists	0.42
* 4111	Judges	0.45
* 4112	Lawyers and Quebec notaries	0.47
3143	Occupational therapists	0.48
* 5225	Audio and video recording technicians	0.50
* 2224	Conservation and fishery officers	0.51

Interpretation example:

- The local share of Program officers unique to government per capita is only 15% of the share of Program officers unique to government per capita at the provincial level.

LOW LOCATION QUOTIENTS (continued)
Creative Class Occupations-Waterloo Region
(*Super-Creative Core)

Creative Class Occupation (with NOC Code)		Location Quotient
*2148	Other professional engineers	0.52
3131	Pharmacists	0.52
3144	Other professional occupations in therapy and assessment	0.52
3221	Denturists	0.52
*4169	Other professional occupations in social science	0.52
0212	Architecture and science managers	0.53
0123	Other business services managers	0.53
3111	Specialist physicians	0.53
3223	Dental technologists, technicians and laboratory bench workers	0.53
0122	Banking, credit and other investment managers	0.54
0011	Legislators	0.58
*2112	Chemists	0.58
3212	Medical laboratory technicians	0.60
3211	Medical laboratory technologists and pathologists' assistants	0.61
*5242	Interior designers	0.62
*2122	Forestry professionals	0.63
3234	Ambulance attendants and other paramedical occupations	0.63
*4164	Social policy researchers, consultants and program officers	0.63
*4163	Business development officers and marketing researchers and consultants	0.64
1121	Specialists in human resources	0.66
*5124	Professional occupations in public relations and communications	0.66
1112	Financial and investment analysts	0.67
1122	Professional occupations in business services to management	0.67
1232	Loan officers	0.67
*2172	Database analysts and data administrators	0.68
3214	Respiratory therapists, clinical perfusionists and cardio-pulmonary technologists	0.68
*5136	Painters, sculptors and other visual artists	0.68
0111	Financial managers	0.69
3112	General practitioners and family physicians	0.69
*2243	Industrial instrument technicians and mechanics	0.70
3151	Head nurses and supervisors	0.70
*4161	Natural and applied science policy researchers, consultants and program officers	0.70
*5132	Conductors, composers and arrangers	0.70
0314	Managers in social, community and correctional services	0.71
*2212	Geological and mineral technologists and technicians	0.71
0131	Telecommunication carriers managers	0.72
0311	Managers in health care	0.72
3213	Veterinary and animal health technologists and technicians	0.72
0114	Other administrative services managers	0.74
3152	Registered nurses	0.74

5 Creative Class Workers by Industry

In the following tables, a high or low concentration of creative class workers in an industry is any in which the concentration is more than eight percentage points above or below the average of all industries. ie. A creative class employment share of more than 39.1% is considered high and an employment share less than 23.1% is considered low.

High Concentrations

Five industries in this area employ over 3,000 creative class workers, with 2 industries employing over 10,000 creative class workers. Of these top 5 industries with the highest volume of creative class workers, each also has at least half of its workforce comprised of creative class workers. Only one manufacturing industry, Computer and electronic products, has a high creative class concentration.

Waterloo Region's Professional, scientific and technical services industry has a higher share of creative class workers compared to the provincial level of that industry (76% locally compared to 73% provincially). Local Insurance carriers also enjoy this higher creative class content (54% locally compared to 47% provincially). Local Credit intermediation has a significantly lower share of creative class workers than the provincial industry (48% locally compared to 56% provincially).

HIGH CREATIVE CLASS CONTENT INDUSTRIES
Waterloo Region

Industry (with NAICS[2] code)		Total Employment	Creative Class Employment	Creative Class Employment Share
	ALL INDUSTRIES	238,465	74,115	31.1%
611	Educational services	19,645	14,185	72.2%
541	Professional, scientific and technical services	15,510	11,860	76.5%
524	Insurance carriers and related activities	9,835	5,300	53.9%
621	Ambulatory health care services	5,865	3,295	56.2%
622	Hospitals	4,905	3,285	67.0%
334	Computer and electronic product manufacturing	5,585	2,890	51.7%
522	Credit intermediation and related activities	2,980	1,440	48.3%
813	Religious, grant-making, civic, and professional and similar organizations	2,650	1,170	44.2%
523	Securities, commodity contracts, and other financial investment and related activities	1,825	1,165	63.8%
511	Publishing industries (except Internet)	1,605	975	60.7%
713	Amusement, gambling and recreation industries	1,955	800	40.9%
711	Performing arts, spectator sports and related industries	700	515	73.6%
519	Other information services	935	480	51.3%
911	Federal government public administration	1,165	460	39.5%
515	Broadcasting (except Internet)	400	320	80.0%
912	Provincial and territorial public administration	600	235	39.2%
551	Management of companies and enterprises	n/a	n/a	64.8%
518	Internet service providers, web search portals, and data processing services	205	150	73.2%
712	Heritage institutions	160	140	87.5%
526	Funds and other financial vehicles	75	55	73.3%

[2] North American Industry Classification System

Low Concentrations

Of the industries with a low concentration of creative class workers, Social assistance has the largest volume of creative class workers, followed by Administrative and support services. 15 of the 21 manufacturing sectors have low creative class concentrations, as do each of the construction sectors and most transportation and warehousing sectors.

Amongst the most prominent local industries with low creative class concentrations, there are none that have significantly higher shares of creative class workers compared to the provincial level of that industry. There are however several industries that have a lower local share of creative class workers than at the provincial level. They include Administrative and support services (12% locally compared to 17% provincially), Transportation equipment manufacturing (9% locally compared to 13% provincially), Clothing and clothing accessories stores (21% locally compared to 24% provincially), and Food manufacturing (9% locally compared to 12% provincially). These local industries, with low concentrations of creative class workers compared to other local industries as well as the provincial level of the same industry, could be experiencing shortages of creative class workers.

LOW CREATIVE CLASS CONTENT INDUSTRIES
Waterloo Region

Industry (with NAICS code)		Total Employment	Creative Class Employment	Creative Class Employment Share
	ALL INDUSTRIES	238,465	74,115	31.1%
624	Social assistance	4,505	985	21.9%
561	Administrative and support services	7,610	950	12.5%
336	Transportation equipment manufacturing	9,990	910	9.1%
332	Fabricated metal product manufacturing	6,575	875	13.3%
445	Food and beverage stores	6,925	855	12.3%
238	Specialty trade contractors	5,190	650	12.5%
811	Repair and maintenance	3,880	630	16.2%
448	Clothing and clothing accessories stores	2,850	585	20.5%
531	Real estate	2,885	555	19.2%
311	Food manufacturing	6,285	540	8.6%
326	Plastics and rubber products manufacturing	5,530	505	9.1%
416	Building material and supplies wholesaler-distributors	2,770	500	18.1%
452	General merchandise stores	3,645	455	12.5%
236	Construction of buildings	2,640	450	17.0%
444	Building material and garden equipment and supplies dealers	2,420	440	18.2%
812	Personal and laundry services	3,040	385	12.7%
337	Furniture and related product manufacturing	3,220	320	9.9%
323	Printing and related support activities	1,515	300	19.8%
484	Truck transportation	4,500	290	6.4%
413	Food, beverage and tobacco wholesaler-distributors	1,745	260	14.9%
418	Miscellaneous wholesaler-distributors	1,320	255	19.3%

LOW CREATIVE CLASS CONTENT INDUSTRIES (continued) Waterloo Region				
Industry (with NAICS code)		Total Employment	Creative Class Employment	Creative Class Employment Share
	ALL INDUSTRIES	238,465	74,115	31.1%
221	Utilities	1,110	235	21.2%
415	Motor vehicle and parts wholesaler-distributors	1,145	235	20.5%
327	Non-metallic mineral product manufacturing	1,140	210	18.4%
442	Furniture and home furnishings stores	1,120	200	17.9%
532	Rental and leasing services	1,040	195	18.8%
331	Primary metal manufacturing	1,210	175	14.5%
237	Heavy and civil engineering construction	800	165	20.6%
111-112	Farms	2,995	150	5.0%
721	Accommodation services	1,180	140	11.9%
722	Food services and drinking places	12,860	140	1.1%
447	Gasoline stations	755	135	17.9%
454	Non-store retailers	525	110	21.0%
314	Textile product mills	1,015	95	9.4%
321	Wood product manufacturing	1,155	80	6.9%
562	Waste management and remediation services	470	75	16.0%
313	Textile mills	395	70	17.7%
493	Warehousing and storage	540	70	13.0%
322	Paper manufacturing	525	60	11.4%
491	Postal service	865	45	5.2%
315	Clothing manufacturing	475	40	8.4%
412	Petroleum product wholesaler-distributors	135	30	22.2%
316	Leather and allied product manufacturing	140	30	21.4%
324	Petroleum and coal products manufacturing	155	30	19.4%
492	Couriers and messengers	605	25	4.1%
485	Transit and ground passenger transportation	1,105	15	1.4%
411	Farm product wholesaler-distributors	45	10	22.2%
481	Air transportation	55	10	18.2%
482	Rail transportation	55	10	18.2%
113	Forestry and logging	105	10	9.5%
115	Support activities for agriculture and forestry	145	10	6.9%
212	Mining (except oil and gas)	135	0	0.0%
213	Support activities for mining and oil and gas extraction	30	0	0.0%
483	Water transportation	10	0	0.0%
486	Pipeline transportation	10	0	0.0%
533	Lessors of non-financial intangible assets (except copyrighted works)	15	0	0.0%
814	Private households	690	0	0.0%

6 Opportunities in Growth Sectors for Creative Class Workers in Declining Industries

There were 20 industries at the 3 digit NAIC code level that experienced net employment loss of over 50 workers between 2001 and 2006 in Waterloo Region. The top seven were each manufacturing industries. A total of 19% of the region's workforce was employed in industries that had experienced significant employment loss in the previous five years. Of the 20 sectors with significant employment loss, 13 of these were sectors that had a particularly low creative class content. Three sectors with a high creative class content declined in employment during this period: Credit intermediation and related activities, Religious, grant-making, civic, and professional and similar organizations, and Provincial and territorial public administration.

DECLINING INDUSTRIES
Waterloo Region (2001 to 2006)

Industry (with NAICS code)		2001 Employment	2006 Employment	Change	Creative Class Content
332	Fabricated metal product manufacturing	8,005	6,580	-1,425	Low
315	Clothing manufacturing	1,820	470	-1,350	Low
336	Transportation equipment manufacturing	10,575	9,985	-590	Low
313	Textile mills	905	395	-510	Low
335	Electrical equipment, appliance and component manufacturing	2,650	2,305	-345	Average
333	Machinery manufacturing	6,430	6,185	-245	Average
339	Miscellaneous manufacturing	1,515	1,295	-220	Average
111-112	Farms	3,165	3,000	-165	Low
522	Credit intermediation and related activities	3,110	2,980	-130	High
813	Religious, grant-making, civic, and professional and similar organizations	2,775	2,655	-120	High
912	Provincial and territorial public administration	715	600	-115	High
454	Non-store retailers	625	525	-100	Low
411	Farm product wholesaler-distributors	130	45	-85	Low
492	Couriers and messengers	675	605	-70	Low
325	Chemical manufacturing	1,140	1,075	-65	Average
811	Repair and maintenance	3,945	3,880	-65	Low
721	Accommodation services	1,230	1,175	-55	Low
316	Leather and allied product manufacturing	190	140	-50	Low
447	Gasoline stations	805	755	-50	Low
485	Transit and ground passenger transportation	1,155	1,105	-50	Low

Among these top 5 declining industries in Waterloo Region, a positive finding is that each of the prevalent creative class occupations in each industry is equally or more prevalent in at least one growth industry, with one exception: transportation equipment manufacturing, a declining industry, is the most common industry for the creative class occupation of industrial and manufacturing engineers.

The following tables examine growth industries where creative class workers in the top nine declining industries could possibly seek work. For this purpose, a growth industry is any industry that had positive employment change from 2001 to 2006 in Waterloo Region. With each occupation and industry listed is the number of workers in 2006.

Declining Industry: FABRICATED METAL PRODUCT MANUFACTURING
Jobs lost 2001 to 2006: 1,425
Number of Employers lost 2003 to 2007 : 19

Creative class occupations in Fabricated metal product manufacturing	Growth industries where this occupation is prevalent and offers employment opportunities
Senior managers - goods production, utilities, transportation and construction (125)	• Computer and electronic product manufacturing (125) • Specialty trade contractors (85) • Construction of buildings (75) • Furniture and related product manufacturing (55) • Plastics and rubber products manufacturing (50)
Mechanical engineers (65)	• Professional, scientific and technical services (220) • Computer and electronic product manufacturing (110) • Plastics and rubber products manufacturing (25)
Industrial engineering and manufacturing technologists and technicians (65)	• Computer and electronic product manufacturing (90) • Plastics and rubber products manufacturing (70) • Professional, scientific and technical services (20) • Food manufacturing (20)
Drafting technologists and technicians (65)	• Professional, scientific and technical services (165) • Construction of buildings (40) • Specialty trade contractors (25) • Furniture and related product manufacturing (20)
Engineering managers (55)	• Computer and electronic product manufacturing (110) • Professional, scientific and technical services (95) • Primary metal manufacturing (20) • Building material and supplies wholesaler-distributors (20)
Financial auditors and accountants (50)	• Professional, scientific and technical services (1,010) • Insurance carriers and related activities (315) • Real estate (50) • Local, municipal and regional public administration (45) • Educational services (45) • Management of companies and enterprises (50) • Motor vehicle and parts dealers (45) • Securities, commodity contracts, and other financial investment and related activities (45)
Mechanical engineering technologists and technicians (50)	• Professional, scientific and technical services (690) • Insurance carriers and related activities (495) • Computer and electronic product manufacturing (130) • Machinery, equipment and supplies wholesaler-distributors (85) • Educational services (70)

Interpretation example:

- As of 2006, there were 125 senior managers in the declining industry of fabricated metal product manufacturing. The growth industry of computer and electronic product manufacturing has 125 senior managers in its workforce, while specialty trade contractors has 85 senior managers.

Declining Industry: CLOTHING MANUFACTURING
Jobs lost 2001 to 2006: 1,350
Number of Employers lost 2003 to 2007 : 5

Creative class occupations in Clothing manufacturing	Growth industries where this occupation is prevalent and offers employment opportunities
Senior managers - goods production, utilities, transportation and construction (10)	• Computer and electronic product manufacturing (125) • Specialty trade contractors (85) • Construction of buildings (75) • Furniture and related product manufacturing (55) • Plastics and rubber products manufacturing (50)
Sales, marketing and advertising managers (10)	• Professional, scientific and technical services (360) • Machinery, equipment and supplies wholesaler-distributors (250) • Computer and electronic product manufacturing (175) • Personal and household goods wholesaler-distributors (140) • Insurance carriers and related activities (125) • Food, beverage and tobacco wholesaler-distributors (125) • Miscellaneous wholesaler-distributors (100)
Industrial instrument technicians and mechanics (10)	• Computer and electronic product manufacturing (10) • Building material and supplies wholesaler-distributors (10) • Primary metal manufacturing (10)
Theatre, fashion, exhibit and other creative designers (10)	• Professional, scientific and technical services (10) • Personal and household goods wholesaler-distributors (10) • Miscellaneous store retailers (10) • General merchandise stores (10)

Declining Industry: TRANSPORTATION EQUIPMENT MANUFACTURING
Jobs lost 2001 to 2006: 590
Number of Employers lost 2003 to 2007 : 2

Creative class occupations in Transportation equipment manufacturing	Growth industries where this occupation is prevalent and offers employment opportunities
Industrial and manufacturing engineers (110)	• Computer and electronic product manufacturing (90) • Professional, scientific and technical services (60) • Furniture and related product manufacturing (30)
Mechanical engineers (65)	• Professional, scientific and technical services (220) • Computer and electronic product manufacturing (110) • Plastics and rubber products manufacturing (25)
Industrial engineering and manufacturing technologists and technicians (65)	• Computer and electronic product manufacturing (90) • Plastics and rubber products manufacturing (70) • Professional, scientific and technical services (20) • Food manufacturing (20)
Human resources managers (60)	• Professional, scientific and technical services (60) • Machinery, equipment and supplies wholesaler-distributors (35) • Insurance carriers and related activities (30) • Building material and supplies wholesaler-distributors (30) • Administrative and support services (30)

Declining Industry: TEXTILE MILLS
Jobs lost 2001 to 2006: 510
Number of Employers lost 2003 to 2007 : 0

Creative class occupations in Textile mills	Growth industries where this occupation is prevalent and offers employment opportunities
Industrial and manufacturing engineers (15)	• Computer and electronic product manufacturing (90) • Professional, scientific and technical services (60) • Furniture and related product manufacturing (30)
Industrial engineering and manufacturing technologists and technicians (15)	• Computer and electronic product manufacturing (90) • Plastics and rubber products manufacturing (70) • Professional, scientific and technical services (20) • Food manufacturing (20)
Human resources managers (10)	• Professional, scientific and technical services (60) • Machinery, equipment and supplies wholesaler-distributors (35) • Insurance carriers and related activities (30) • Building material and supplies wholesaler-distributors (30) • Administrative and support services (30)
Facility operation and maintenance managers (10)	• Amusement, gambling and recreation industries (45) • Specialty trade contractors (35) • Nursing and residential care facilities (35) • Warehousing and storage (30)
Mechanical engineers (10)	• Professional, scientific and technical services (220) • Computer and electronic product manufacturing (110) • Plastics and rubber products manufacturing (25)
Information systems analysts and consultants (10)	• Professional, scientific and technical services (690) • Insurance carriers and related activities (495) • Computer and electronic product manufacturing (130) • Management of companies and enterprises (135) • Machinery, equipment and supplies wholesaler-distributors (85) • Educational services (70)

Declining Industry:	ELECTRICAL EQUIPMENT, APPLIANCE AND COMPONENT MANUFACTURING Jobs lost 2001 to 2006: 345 Number of Employers lost 2003 to 2007 : 0
Creative class occupations in Electrical equipment, appliance and component manufacturing	Growth industries where this occupation is prevalent and offers employment opportunities
Sales, marketing and advertising managers (75)	• Professional, scientific and technical services (360) • Machinery, equipment and supplies wholesaler-distributors (250) • Computer and electronic product manufacturing (175) • Personal and household goods wholesaler-distributors (140) • Insurance carriers and related activities (125) • Food, beverage and tobacco wholesaler-distributors (125) • Miscellaneous wholesaler-distributors (100)
Electrical and electronics engineering technologists and technicians (70)	• Computer and electronic product manufacturing (175) • Professional, scientific and technical services (105) • Machinery, equipment and supplies wholesaler-distributors (55) • Specialty trade contractors (30) • Telecommunications (25) • Utilities (20)
Electrical and electronics engineers (60)	• Professional, scientific and technical services (275) • Computer and electronic product manufacturing (240)
Drafting technologists and technicians (40)	• Professional, scientific and technical services (165) • Construction of buildings (40) • Specialty trade contractors (25)
Industrial and manufacturing engineers (35)	• Computer and electronic product manufacturing (90) • Professional, scientific and technical services (60) • Furniture and related product manufacturing (30)
Software engineers and designers (35)	• Professional, scientific and technical services (580) • Computer and electronic product manufacturing (120) • Publishing industries (except Internet) (110) • Insurance carriers and related activities (90)

Declining Industry: MACHINERY MANUFACTURING
Jobs lost 2001 to 2006: 245
Number of Employers lost 2003 to 2007 : 4

Creative class occupations in Machinery manufacturing	Growth industries where this occupation is prevalent and offers employment opportunities
Mechanical engineers (215)	• Professional, scientific and technical services (220) • Computer and electronic product manufacturing (110) • Plastics and rubber products manufacturing (25)
Sales, marketing and advertising managers (100)	• Professional, scientific and technical services (360) • Machinery, equipment and supplies wholesaler-distributors (250) • Computer and electronic product manufacturing (175) • Personal and household goods wholesaler-distributors (140) • Insurance carriers and related activities (125) • Food, beverage and tobacco wholesaler-distributors (125) • Miscellaneous wholesaler-distributors (100)
Mechanical engineering technologists and technicians (90)	• Professional, scientific and technical services (45) • Plastics and rubber products manufacturing (15) • Primary metal manufacturing (15)
Industrial engineering and manufacturing technologists and technicians (85)	• Computer and electronic product manufacturing (90) • Plastics and rubber products manufacturing (70) • Professional, scientific and technical services (20) • Food manufacturing (20)
Financial auditors and accountants (75)	• Professional, scientific and technical services (1,010) • Insurance carriers and related activities (315) • Real estate (50) • Local, municipal and regional public administration (45) • Educational services (45) • Motor vehicle and parts dealers (45) • Securities, commodity contracts, and other financial investment and related activities (45)
Electrical and electronics engineers (75)	• Professional, scientific and technical services (275) • Computer and electronic product manufacturing (240)
Industrial and manufacturing engineers (70)	• Computer and electronic product manufacturing (90) • Professional, scientific and technical services (60) • Furniture and related product manufacturing (30)

Declining Industry:	MISCELLANEOUS MANUFACTURING Jobs lost 2001 to 2006: 220 Number of Employers lost 2003 to 2007 : 0
Creative class occupations in Miscellaneous manufacturing	Growth industries where this occupation is prevalent and offers employment opportunities
Graphic designers and illustrators (75)	• Professional, scientific and technical services (250) • Printing and related support activities (115)
Dental technologists, technicians, and laboratory bench workers (25)	• Ambulatory health care services (30)
Senior managers - goods production, utilities, transportation and construction (20)	• Computer and electronic product manufacturing (125) • Specialty trade contractors (85) • Construction of buildings (75) • Furniture and related product manufacturing (55) • Plastics and rubber products manufacturing (50)
Drafting technologists and technicians (20)	• Professional, scientific and technical services (165) • Construction of buildings (40) • Specialty trade contractors (25)

Miscellaneous manufacturing includes: medical equipment and supplies, jewelry, silverware, sporting and athletic goods, toys and games, office supplies (except paper), signs, and all other manufacturing not classified elsewhere.

Declining Industry: FARMING Jobs lost 2001 to 2006: 42	
Creative class occupations in Farming	Growth industries where this occupation is prevalent and offers employment opportunities
Senior managers - goods production, utilities, transportation and construction (25)	• Computer and electronic product manufacturing (125) • Specialty trade contractors (85) • Construction of buildings (75) • Furniture and related product manufacturing (55) • Plastics and rubber products manufacturing (50)
Landscape and horticultural technicians and specialists (20)	• Local, municipal and regional public administration (40) • Professional, scientific and technical services (20)

Declining Industry: CREDIT INTERMEDIATION AND RELATED ACTIVITIES Jobs lost 2001 to 2006: 130	
Creative class occupations in Credit intermediation and related activities	Growth industries where this occupation is prevalent and offers employment opportunities
Banking, credit and other investment managers (475)	• Securities, commodity contracts, and other financial investment and related activities (60) • Insurance carriers and related activities (45)
Loan officers (360)	• Insurance carriers and related activities (40) • Securities, commodity contracts, and other financial investment and related activities (15)
Other financial officers (195)	• Securities, commodity contracts, and other financial investment and related activities (405) • Insurance carriers and related activities (180) • Professional, scientific and technical services (45)
Financial and investment analysts (70)	• Local, municipal and regional public administration (15)

Appendix

Complete List: CREATIVE CLASS OCCUPATIONS (*Super-Creative Core)	
0011	Legislators
0012	Senior government managers and officials
0013	Senior managers - Financial, communications and other business services
0014	Senior managers - Health, education, social and community services and membership organizations
0015	Senior managers - Trade, broadcasting and other services, n.e.c.
0016	Senior managers - Goods production, utilities, transportation and construction
0111	Financial managers
0112	Human resources managers
0113	Purchasing managers
0114	Other administrative services managers
0211	Engineering managers
0213	Computer and information systems managers
0212	Architecture and science managers
0611	Sales, marketing and advertising managers
0712	Facility operation and maintenance managers
0621	Retail trade managers
0121	Insurance, real estate and financial brokerage managers
0122	Banking, credit and other investment managers
0123	Other business services managers
0131	Telecommunication carriers managers
0311	Managers in health care
0312	Administrators, post-secondary education and vocational training
0313	School principals and administrators of elementary and secondary education
0314	Managers in social, community and correctional services
0411	Government managers, health and social policy development and program administration
0412	Government managers, economic analysis, policy development and program administration
0413	Government managers, education policy development and program administration
0414	Other managers in public administration
0511	Library, archive, museum and art gallery managers
0512	Managers, publishing, motion pictures, broadcasting and performing arts
0513	Recreation and sports program and service directors
1111	Financial auditors and accountants
1112	Financial and investment analysts
1113	Securities agents, investment dealers and brokers
1114	Other financial officers
1121	Specialists in human resources
1122	Professional occupations in business services to management
1231	Bookkeepers
1232	Loan officers
1233	Insurance adjusters and claims examiners
1234	Insurance underwriters
1235	Assessors, valuators and appraisers
1236	Customs, ship and other brokers
* 2111	Physicists and astronomers
* 2112	Chemists
* 2113	Geologists, geochemists and geophysicists
* 2114	Meteorologists
* 2115	Other professional occupations in physical sciences
* 2121	Biologists and related scientists

Complete List: CREATIVE CLASS OCCUPATIONS (continued) (*Super-Creative Core)

* 2122	Forestry professionals
* 2123	Agricultural representatives, consultants and specialists
* 2131	Civil engineers
* 2132	Mechanical engineers
* 2133	Electrical and electronics engineers
* 2134	Chemical engineers
* 2141	Industrial and manufacturing engineers
* 2142	Metallurgical and materials engineers
* 2143	Mining engineers
* 2144	Geological engineers
* 2145	Petroleum engineers
* 2146	Aerospace engineers
* 2147	Computer engineers (except software engineers)
* 2148	Other professional engineers, n.e.c.
* 2151	Architects
* 2152	Landscape architects
* 2153	Urban and land use planners
* 2154	Land surveyors
* 2161	Mathematicians, statisticians and actuaries
* 2171	Information systems analysts and consultants
* 2172	Database analysts and data administrators
* 2173	Software engineers
* 2174	Computer programmers and interactive media developers
* 2175	Web designers and developers
* 2211	Chemical technologists and technicians
* 2212	Geological and mineral technologists and technicians
* 2213	Meteorological technicians
* 2221	Biological technologists and technicians
* 2222	Agricultural and fish products inspectors
* 2223	Forestry technologists and technicians
* 2224	Conservation and fishery officers
* 2225	Landscape and horticultural technicians and specialists
* 2231	Civil engineering technologists and technicians
* 2232	Mechanical engineering technologists and technicians
* 2233	Industrial engineering and manufacturing technologists and technicians
* 2234	Construction estimators
* 2241	Electrical and electronics engineering technologists and technicians
* 2242	Electronic service technicians (household and business equipment)
* 2243	Industrial instrument technicians and mechanics
* 2244	Aircraft instrument, electrical and avionics mechanics, technicians and inspectors
* 2251	Architectural technologists and technicians
* 2252	Industrial designers
* 2253	Drafting technologists and technicians
* 2254	Land survey technologists and technicians
* 2255	Mapping and related technologists and technicians
* 2261	Non-destructive testers and inspectors
* 2262	Engineering inspectors and regulatory officers
* 2263	Inspectors in public and environmental health and occupational health and safety
* 2264	Construction inspectors
* 2271	Air pilots, flight engineers and flying instructors
* 2272	Air traffic control and related occupations

Complete List: CREATIVE CLASS OCCUPATIONS (continued) (*Super-Creative Core)

* 2273	Deck officers, water transport
* 2274	Engineer officers, water transport
* 2275	Railway traffic controllers and marine traffic regulators
* 2281	Computer and network operators and web technicians
* 2282	User support technicians
* 2283	Systems testing technicians
3111	Specialist physicians
3112	General practitioners and family physicians
3113	Dentists
3114	Veterinarians
3121	Optometrists
3122	Chiropractors
3123	Other professional occupations in health diagnosing and treating
3131	Pharmacists
3132	Dietitians and nutritionists
3141	Audiologists and speech-language pathologists
3142	Physiotherapists
3143	Occupational therapists
3144	Other professional occupations in therapy and assessment
3151	Head nurses and supervisors
3152	Registered nurses
3211	Medical laboratory technologists and pathologists' assistants
3212	Medical laboratory technicians
3213	Veterinary and animal health technologists and technicians
3214	Respiratory therapists, clinical perfusionists and cardio-pulmonary technologists
3215	Medical radiation technologists
3216	Medical sonographers
3217	Cardiology technologists
3218	Electroencephalographic and other diagnostic technologists, n.e.c.
3219	Other medical technologists and technicians (except dental health)
3221	Denturists
3222	Dental hygienists and dental therapists
3223	Dental technologists, technicians and laboratory bench workers
3231	Opticians
3232	Midwives and practitioners of natural healing
3233	Licensed practical nurses
3234	Ambulance attendants and other paramedical occupations
3235	Other technical occupations in therapy and assessment
* 4111	Judges
* 4112	Lawyers and Quebec notaries
* 4151	Psychologists
* 4152	Social workers
* 4153	Family, marriage and other related counselors
* 4154	Ministers of religion
* 4155	Probation and parole officers and related occupations
* 4161	Natural and applied science policy researchers, consultants and program officers
* 4162	Economists and economic policy researchers and analysts
* 4163	Business development officers and marketing researchers and consultants
* 4164	Social policy researchers, consultants and program officers
* 4166	Education policy researchers, consultants and program officers

Complete List: CREATIVE CLASS OCCUPATIONS (continued) (*Super-Creative Core)

* 4167	Recreation, sports and fitness program supervisors and consultants
* 4168	Program officers unique to government
* 4169	Other professional occupations in social science, n.e.c.
* 4165	Health policy researchers, consultants and program officers
* 4121	University professors
* 4122	Post-secondary teaching and research assistants
* 4131	College and other vocational instructors
* 4141	Secondary school teachers
* 4142	Elementary school and kindergarten teachers
* 4143	Educational counsellors
* 5111	Librarians
* 5112	Conservators and curators
* 5113	Archivists
* 5121	Authors and writers
* 5122	Editors
* 5123	Journalists
* 5124	Professional occupations in public relations and communications
* 5125	Translators, terminologists and interpreters
* 5131	Producers, directors, choreographers and related occupations
* 5132	Conductors, composers and arrangers
* 5133	Musicians and singers
* 5134	Dancers
* 5135	Actors and comedians
* 5136	Painters, sculptors and other visual artists
* 5211	Library and archive technicians and assistants
* 5212	Technical occupations related to museums and art galleries
* 5221	Photographers
* 5222	Film and video camera operators
* 5223	Graphic arts technicians
* 5224	Broadcast technicians
* 5225	Audio and video recording technicians
* 5226	Other technical and co-ordinating occupations in motion pictures, broadcasting and the performing arts
* 5227	Support occupations in motion pictures, broadcasting and the performing arts
* 5231	Announcers and other broadcasters
* 5232	Other performers
* 5241	Graphic designers and illustrators
* 5242	Interior designers
* 5243	Theatre, fashion, exhibit and other creative designers
* 5244	Artisans and craftspersons
* 5245	Patternmakers, textile, leather and fur products
* 5251	Athletes
* 5252	Coaches
* 5253	Sports officials and referees
* 5254	Program leaders and instructors in recreation and sport

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