

An Independent Study Commissioned by



RESIDENTIAL AND
CIVIL
CONSTRUCTION
ALLIANCE OF
ONTARIO
Constructing Ontario's Future

Detailed SRI0 modelling used for the report

Investing in Ontario's Infrastructure for Economic Growth and Job Creation: An Input-Output Analysis

May 2013

by Regional Analytics Inc.





RCCAO

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The Residential and Civil Construction Alliance of Ontario (RCCAO) is composed of management and labour groups that represents a wide spectrum of the Ontario construction industry. The RCCAO's goal is to work in cooperation with governments and related stakeholders to offer realistic solutions to a variety of challenges facing the construction industry and which also have wider societal benefits. For more information on the RCCAO or to view copies of other studies and submissions, please visit the RCCAO website at www.rccao.com

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INTRODUCTION

The purpose of this analysis is to evaluate the impact of infrastructure investments by the Government of Ontario in terms of provincial industrial output, GDP and employment by industry.

METHODOLOGY

A synthetic regional Input-Output (IO) model (SRIO) is used to estimate the economic impacts associated with specified levels of infrastructure spending in the Province of Ontario. The SRIO model is based on the most recent (2008) Link (L) level IO tables for Canada as a whole. Information relating the economic structure and size of the Province of Ontario was used to create a synthetic IO database reflective of the provincial economy. The link-level IO data allows the provincial economy to be represented with an unparalleled level of industrial detail (104 4-digit NAICS industries).

While survey-based IO data is available for the Province of Ontario, it is very problematic. First, the provincial IO data is very coarse, with fewer than 25 industries. Secondly, the provincial data is fraught with “confidentiality holes” which seriously limit the utility of this data. These confidentiality holes occur both in specific rows and columns as well as in the totals. As a result, there is very little a researcher can do to balance a table.

The coarseness of the provincial IO data combined with the confidentiality problem means that these data are very difficult to use in provincial economic impact analysis. As a result of these and other problems associated with survey-based provincial IO tables, we have chosen to rely on ‘synthetic’ methods of producing regional tables, based on the use of finely grained national IO tables.

The SRIO model has the following general structure:

$$\Delta \dot{X}^R = (I - \hat{\Phi} \dot{A})^{-1} \Delta \dot{Y}^R$$

where

$$\Delta \dot{X}^R = \begin{bmatrix} \Delta x_1^R \\ \Delta x_2^R \\ \Delta x_3^R \\ \vdots \\ \Delta x_n^R \\ \Delta x_h^R \end{bmatrix} \text{ and where; } \Delta \dot{Y}^R = \begin{bmatrix} \Delta y_1^R \\ \Delta y_2^R \\ \Delta y_3^R \\ \vdots \\ \Delta y_n^R \\ \Delta y_h^R \end{bmatrix}$$

where

$$\hat{\Phi} = \begin{pmatrix} \phi_1 & \dots & 0 \\ \vdots & \ddots & \vdots \\ 0 & \dots & \phi_n \end{pmatrix}$$

where

$$\phi_i = \left(\frac{\frac{e_i^R}{\sum_l e_l^R}}{\frac{e_i^{CAN}}{\sum_l e_l^{CAN}}} \right)$$

and where the matrices \dot{X} , \dot{Y} and \dot{A} denote standard IO matrices that have been augmented to allow for the endogenous treatment of consumption expenditures. In the above equations:

X denotes a vector of industry gross output;

Y denotes a vector of industry final demand;

M denotes imports;

e denotes employment;

i and j represent industries where i is typically a row (selling) industry and j is typically a column (purchasing) industry;

ϕ_i denotes an employment-based index of relative specialization;

$\hat{\Phi}$ is a diagonal matrix of ϕ_i 's;

l typically denotes occupations;

V denotes total employment; and,

K denotes a matrix of occupation- and industry-specific employment multipliers.

The SRIO model described above generates industry output values across n industries (in this case $n = 104$). Industry output is a monetary measurement of the amount of output each industry in the economy has to produce in order to satisfy all direct, indirect and induced input requirements associated with all rounds of spending triggered by a given exogenous shock to external final demand categories (e.g., investment). Industry output (denoted above as X) generally includes all margins added to the value of inputs as they proceed through the respective value chains. As such, while industry output is a useful measure of the amount of economic activity taking place in the economy, it does involve some double counting. For example, consider a bakery that purchases flour to produce baked goods; the price of the flour includes the price of the wheat plus the value added by the miller. When the bakery sells the bread, the price reflects the cost of all inputs (including the flour) as well as the baker's value added. So, while the both the activity at the mill and at the bakery each generate activity (i.e., employment) the value of inputs gets counted and re-counted with each round of spending. To get around this problem and to compute the value of the unduplicated (net) economic production, economists rely on a measure known as Gross Domestic Product (GDP). GDP is computed from the elements of the payments sector (e.g., subsidies on products, wages, taxes and tariffs etc.) and, as noted, is a reflection of the net value-created as a result of a given external shock. The SRIO model used in this analysis computes both gross industry output (X) and GDP by industry in response to a given economic shock.

While information pertaining to the total amount of employment that is likely to accompany a given scenario is a very useful piece of information (and one that typically flows from a scenario-based forecasting exercise), even more useful is information on the exact industrial and occupational nature of this employment impact (e.g., α aerospace manufacturing jobs, λ engineers, ζ managers, χ nurses etc.). And, of the two, the occupational composition of the total employment is far more useful and broadly applicable than is a single number of newly created jobs in a given industry. This becomes even more true in the context of potential supply constraints on key inputs such as appropriately-skilled labour. The demographic and occupational composition of a region's labour force has much to do with its long-term economic growth and development since these issues play key roles in the locational decision-making processes of firms (and workers). From an intra-provincial perspective, the spatial distribution of employment and the spatial distribution of appropriately skilled labour has much to do with the determination of commuting patterns and the demand for new transportation systems. In light of this, the infrastructure development scenario discussed above will be examined in terms of its impact on the demand for labour in the province on an occupationally specific basis.¹ The estimation of occupation-specific employment

¹ Occupational detail will consist of 26 2-digit Major Groups in the 2002 NOCS.

impacts for any run of the impact model discussed above is made possible via by a matrix of occupation- and industry-specific employment multipliers that are defined as follows:

$$\epsilon_j^l = \left(\frac{V_j^l}{X_j} \right)$$

where this equation denotes a linear employment multiplier that is specific to industry j and occupation l .

Output from the SRIO model above is easily translated into industry and occupation-specific employment impacts as follows:

$$\Delta V = E \left[(I - \hat{\Phi} \hat{A})^{-1} \Delta \dot{Y} \right]$$

where

$$E = [\epsilon_j^l]$$

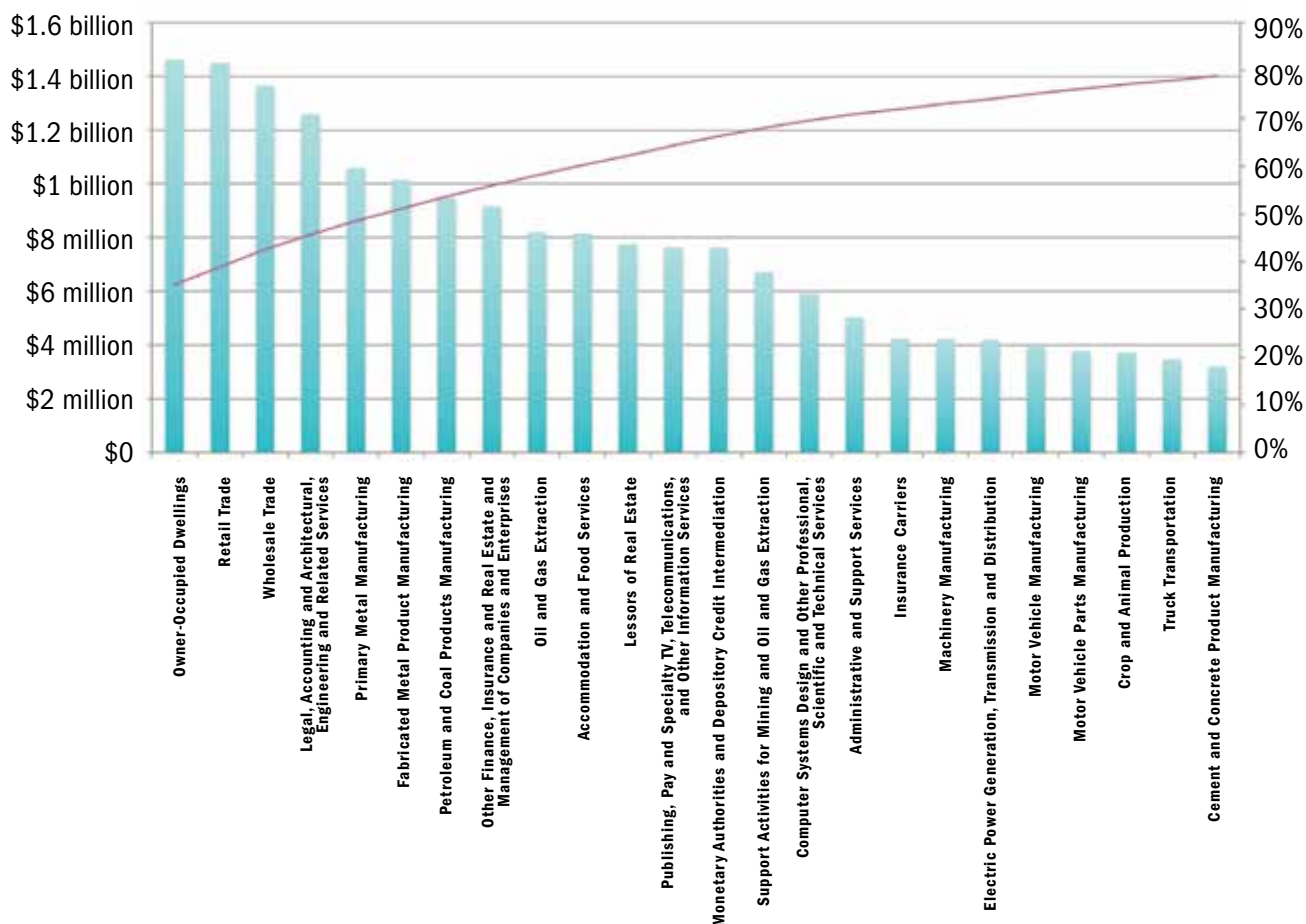
where V denotes occupation-specific employment impacts.

Measuring the Economic Impact of Infrastructure Spending in Ontario

Aggregate Impacts

A shock of \$12 Billion (2008CDN) in Non-residential Building and Engineering Construction would have a very substantial impact on the provincial economy. Based on the 2008 provincial industrial structure, this level of infrastructure expenditure would stimulate a total economic impact, province-wide, on the order of \$38.4 Billion including all direct (14 percent), indirect (43 percent) and induced (44 percent) impacts. This level of industry output translates into a GDP impact of nearly \$18.5 Billion.

Figure 1: Output Impacts by Industry for the 25 Top-Ranked Industries, 2008 Industry Structure²



Output Impacts by Industry

Figure 1 shows that the \$38.4 Billion impact to total gross industry output is distributed across many industries. Indeed, more than 80 percent of the industry output impact is concentrated in 25 industrial sectors (see Figure 1), with “Owner-Occupied Dwellings”, “Retail Trade”, “Wholesale Trade”, “Legal, Accounting and Architectural, Engineering and Related Service” and “Primary Metal Manufacturing” industries accounting for the largest impacts.

Employment Impacts by Industry

In the process of generating this activity, these expenditures would create or sustain more than 203,533 jobs in Ontario across most economic sectors in the economy.

² Industry output impacts for all 104 industries in the 2008 Link-level IO tables are shown in Appendix A.

Figure 2: Employment Impacts by Industry for the 25 Top-Ranked Industries in Ontario, 2008 Industry Structure

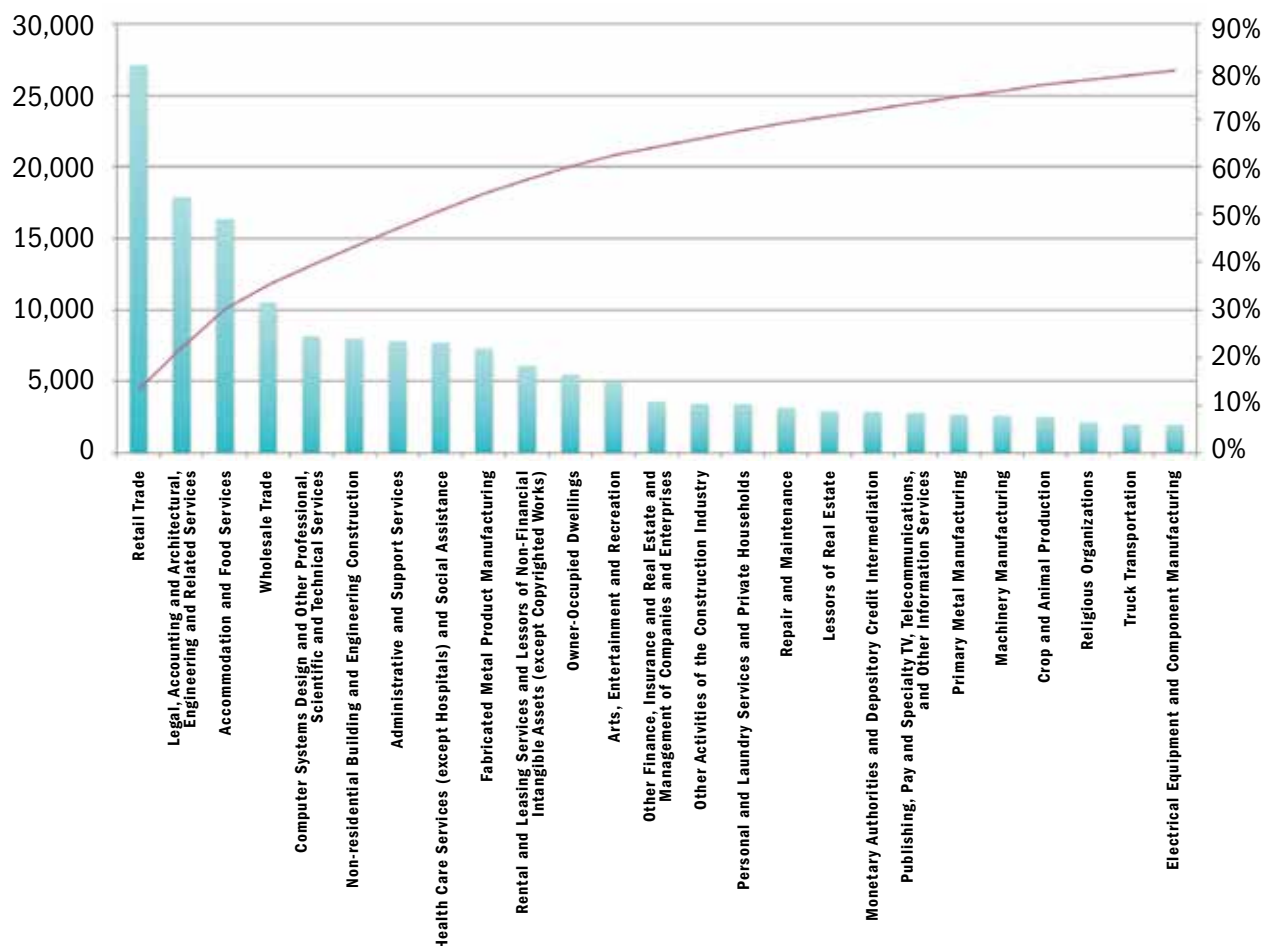


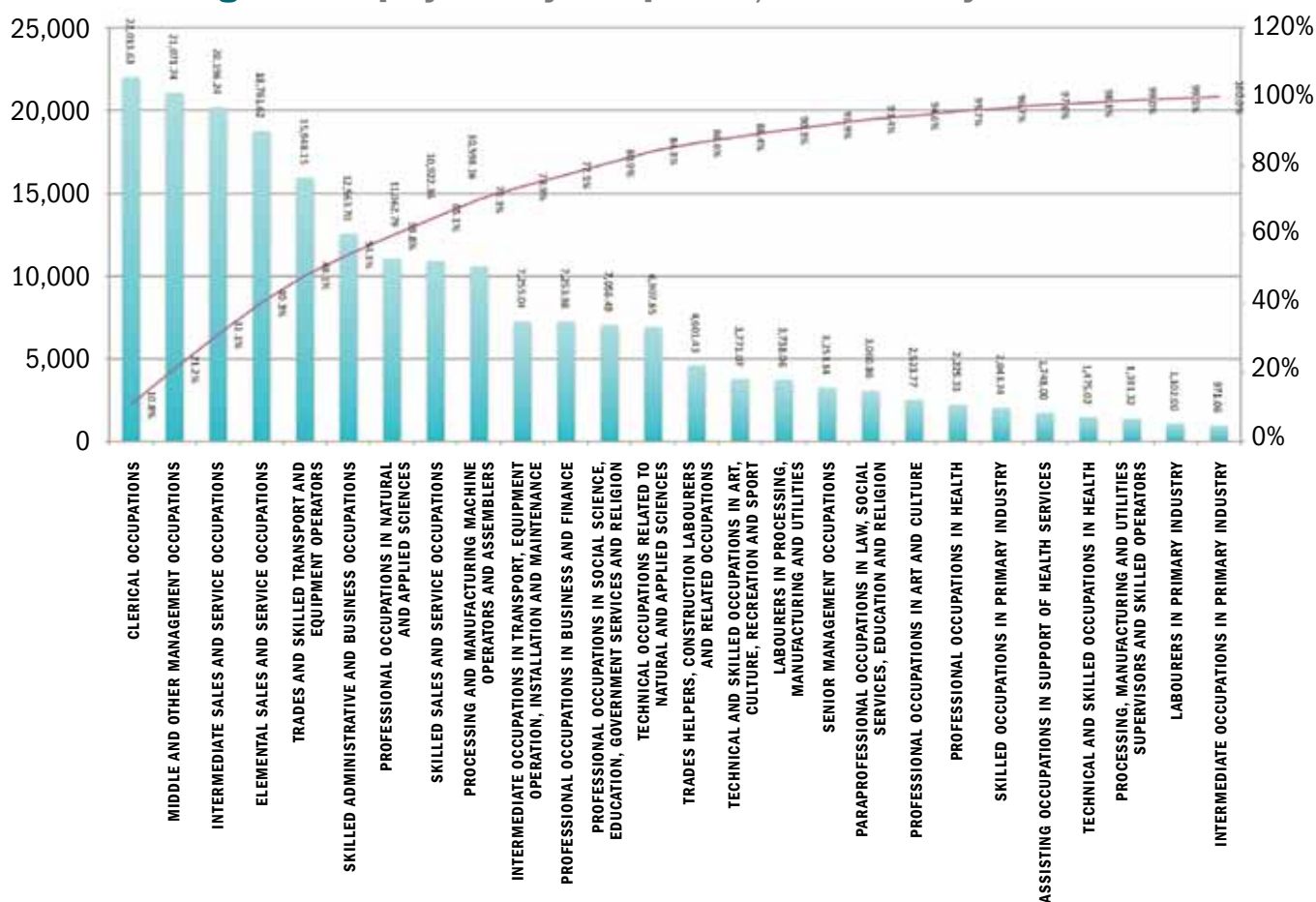
Figure 2 shows that very nearly 80 percent of the employment impact generated by the industrial activities previously described is captured by the top-ranked 25 industrial sectors in terms of employment impacts. The “Retail Trade industry”, followed by the “Legal, Accounting and Architectural, Engineering and Related Services” industry, the “Accommodation and Food Services” industry, “Wholesale Trade” and “Computer Systems Design and Other Professional, Scientific, and Technical Services” industries account for the largest employment impacts. The fact that high value-added service industries figure so prominently in the impact pattern is a reflection of the demanding nature of infrastructure development and the maturity and diversity of the provincial economy. Clearly, sustained infrastructure spending would create substantial demand for employees of all sorts.

Employment Impacts by Occupation

While knowledge of how a total employment impact is distributed across the industries is important, it is also very helpful to know how these jobs are distributed across the spectrum of occupations. Indeed, it stands to reason that firms in any given industry can employ a broad range of skills in their labour force – from low skill levels to extremely high skill levels. Failure to distinguish the occupational distribution of employment impacts therefore results in an inability to distinguish those industries likely to nurture the development of the “Creative Class” from those who are more likely to support those jobs associated with *Fordist* or *Taylorist* modes of production.

Figure 3 shows how the total employment impact alluded to above is distributed across broad occupational categories.³

Figure 3: Employment by Occupations, 2008 Industry Structure



³ These broad occupational categories conform to the 2-digit National Occupational Classification (NOC) system used to track occupations in Canada.

Figure 3 shows that an infrastructure shock of \$12 Billion in one year (assuming the 2008 industrial structure) has the potential to generate more than 203,000 jobs in the provincial economy and that these jobs will be created in many different occupational groups, ranging from low- to extremely highly-skilled occupations. Nearly 11 percent of the jobs created will be for “Clerical Occupations”, followed by “Middle and Other Management Occupations” (10.4 percent), “Intermediate Sales and Service Occupations” (9.9 percent), “Elemental Sales and Service Occupations” (9.2 percent), “Trades and Skilled Transport and Equipment Operators” (7.8 percent) and “Skilled Administrative and Business Occupations” (6.2 percent). These top five occupational groups account for more than 54 percent of the total employment impact in the Province. It is interesting to note that the occupations capturing the smallest shares of total employment are those associated with the low-end of the value-added/skill continuum (however, it is worth noting that these least important occupational groups in terms of the number of jobs they capture amount to less than two percent of all of the employment generated).

**Appendix A: Output Impacts by Industry, 2008 Industry Structure,
by Direct, Indirect, Induced and Total Impact Categories**

	Direct	Indirect	Induced	Total
Crop and Animal Production	\$5,483,933.71	\$25,078,962.16	\$342,203,070.66	\$372,765,966.53
Forestry and Logging	\$2,749,621.07	\$15,092,081.72	\$19,527,146.85	\$37,368,849.63
Fishing, Hunting and Trapping	\$8,281.61	\$125,938.97	\$6,167,073.07	\$6,301,293.66
Support Activities for Agriculture and Forestry	\$938,206.4	\$1,613,342.76	\$6,329,501.8	\$8,881,050.95
Oil and Gas Extraction	\$14,350,592.72	\$315,375,918.32	\$490,755,210.79	\$820,481,721.83
Coal Mining	\$592,574.52	\$15,343,011.35	\$16,519,833.17	\$32,455,419.04
Metal Ore Mining	\$4,828,055.04	\$188,434,960.55	\$59,042,506.12	\$252,305,521.71
Non-Metallic Mineral Mining and Quarrying	\$75,552,969.31	\$33,105,320.49	\$20,304,948.11	\$128,963,237.91
Support Activities for Mining and Oil and Gas Extraction	\$659,261,962.21	\$7,445,268.86	\$4,797,682.95	\$671,504,914.02
Electric Power Generation, Transmission and Distribution	\$17,067,589.26	\$82,416,181.22	\$320,099,127.87	\$419,582,898.35
Natural Gas Distribution, Water, Sewage and Other Systems	\$2,043,613.54	\$9,343,145.21	\$50,282,540.32	\$61,669,299.07
Residential Building Construction	\$-	\$-	\$-	\$-
Non-residential Building and Engineering Construction	\$-	\$12,000,000,000	\$-	\$12,000,000,000
Repair Construction	\$5,357,199.93	\$34,382,756.4	\$207,261,276.76	\$247,001,233.09
Other Activities of the Construction Industry	\$12,317,770.37	\$9,502,934.51	\$12,832,724.61	\$34,653,429.49

	Direct	Indirect	Induced	Total
Animal Food Manufacturing	\$1,876,350.05	\$3,199,811.39	\$37,671,719.57	\$42,747,881.01
Sugar and Confectionery Product Manufacturing	\$643,769.95	\$1,313,503.71	\$47,016,263.51	\$48,973,537.17
Fruit and Vegetable Preserving and Specialty Food Manufacturing	\$1,428,201.85	\$2,400,070.43	\$73,316,024.51	\$77,144,296.79
Dairy Product Manufacturing	\$1,260,938.35	\$5,170,310.27	\$149,638,119.61	\$156,069,368.24
Meat Product Manufacturing	\$3,424,948.99	\$10,127,570.41	\$202,417,053.97	\$215,969,573.38
Seafood Product Preparation and Packaging	\$182,132.75	\$744,354.1	\$20,547,375.8	\$21,473,862.64
Miscellaneous Food Manufacturing	\$3,273,746.81	\$12,774,922.28	\$246,597,612.6	\$262,646,281.69
Soft Drink and Ice Manufacturing	\$211,808.53	\$1,177,568.64	\$47,773,113.9	\$49,162,491.06
Breweries	\$1,048,000.51	\$2,745,131.88	\$59,649,337.01	\$63,442,469.39
Wineries	\$137,838.67	\$877,711.33	\$31,638,484.54	\$32,654,034.53
Distilleries	\$184,642.33	\$563,206.38	\$14,073,595.9	\$14,821,444.61
Tobacco Manufacturing	\$762,912.25	\$1,126,473.75	\$30,977,220.22	\$32,866,606.21
Textile and Textile Product Mills	\$16,754,832.88	\$11,702,535	\$82,249,855.65	\$110,707,223.53
Clothing Manufacturing	\$2,455,498.32	\$2,660,639.38	\$139,705,331.7	\$144,821,469.41
Leather and Allied Product Manufacturing	\$892,343.83	\$1,656,284.63	\$42,894,598.71	\$45,443,227.16
Wood Product Manufacturing	\$65,067,505.86	\$19,142,591.4	\$34,942,497.57	\$119,152,594.83

**Appendix A: Output Impacts by Industry, 2008 Industry Structure,
by Direct, Indirect, Induced and Total Impact Categories (Continued)**

	Direct	Indirect	Induced	Total
Pulp, Paper and Paperboard Mills	\$2,922,719.34	\$26,128,009.62	\$67,373,221.19	\$96,423,950.15
Converted Paper Product Manufacturing	\$8,872,744.75	\$23,013,126.94	\$75,370,835.92	\$107,256,707.6
Printing and Related Support Activities	\$6,292,143.87	\$32,258,454.45	\$91,738,836.48	\$130,289,434.8
Petroleum and Coal Products Manufacturing	\$256,886,545.26	\$163,212,112.88	\$528,517,493.94	\$948,616,152.08
Basic Chemical Manufacturing	\$9,258,341.68	\$90,927,145.33	\$110,523,782.23	\$210,709,269.24
Resin, Synthetic Rubber, and Artificial and Synthetic Fibres and Filaments Manufacturing	\$5,031,581.95	\$70,432,939.1	\$85,817,091.17	\$161,281,612.23
Pesticides, Fertilizer and Other Agricultural Chemical Manufacturing	\$992,915.24	\$6,634,414.02	\$28,902,518.24	\$36,529,847.5
Pharmaceutical and Medicine Manufacturing	\$4,488,132.46	\$14,594,967.96	\$110,117,329.85	\$129,200,430.26
Miscellaneous Chemical Product Manufacturing	\$24,683,473.72	\$54,336,885	\$127,269,141.4	\$206,289,500.12
Plastic Product Manufacturing	\$92,621,813.35	\$46,247,917.87	\$111,702,498.82	\$250,572,230.04
Rubber Product Manufacturing	\$18,195,519.89	\$15,027,530.91	\$46,814,710.98	\$80,037,761.77
Cement and Concrete Product Manufacturing	\$253,472,011.03	\$55,429,314.69	\$11,470,663.5	\$320,371,989.21
Miscellaneous Non-Metallic Mineral Product Manufacturing	\$69,964,574.34	\$30,079,097.84	\$42,212,919.72	\$142,256,591.9

	Direct	Indirect	Induced	Total
Primary Metal Manufacturing	\$273,377,182.13	\$547,501,060.96	\$238,839,735.56	\$1,059,717,978.65
Fabricated Metal Product Manufacturing	\$649,525,859.28	\$196,156,927.56	\$170,560,799.22	\$1,016,243,586.07
Machinery Manufacturing	\$187,513,039.69	\$97,505,300.61	\$137,713,685.85	\$422,732,026.15
Computer and Peripheral Equipment Manufacturing	\$2,051,581.46	\$25,534,420.29	\$36,933,286.19	\$64,519,287.94
Electronic Product Manufacturing	\$118,322,357.01	\$62,136,249.47	\$123,175,308.6	\$303,633,915.08
Household Appliance Manufacturing	\$5,746,686.71	\$1,902,462.36	\$44,453,504.37	\$52,102,653.44
Electrical Equipment and Component Manufacturing	\$140,575,679.17	\$69,789,363.13	\$78,956,922.58	\$289,321,964.87
Motor Vehicle Manufacturing	\$4,404,626.19	\$7,749,508.04	\$381,757,833.91	\$393,911,968.14
Motor Vehicle Body and Trailer Manufacturing	\$2,433,727.72	\$1,949,621.38	\$29,668,359.92	\$34,051,709.02
Motor Vehicle Parts Manufacturing	\$14,523,063.59	\$40,768,720.13	\$322,203,807.98	\$377,495,591.7
Aerospace Product and Parts Manufacturing	\$1,308,118.45	\$9,138,484.79	\$15,079,784.2	\$25,526,387.44
Railroad Rolling Stock Manufacturing	\$35,322.34	\$538,286.87	\$671,344.07	\$1,244,953.27
Ship and Boat Building	\$139,407.16	\$561,874.29	\$4,989,411.6	\$5,690,693.04
Other Transportation Equipment Manufacturing	\$947,931.02	\$1,423,076.32	\$32,803,515.14	\$35,174,522.48
Furniture and Related Product Manufacturing	\$10,705,616.33	\$2,589,915.04	\$59,853,392.69	\$73,148,924.06

**Appendix A: Output Impacts by Industry, 2008 Industry Structure,
by Direct, Indirect, Induced and Total Impact Categories (Continued)**

	Direct	Indirect	Induced	Total
Miscellaneous Manufacturing	\$35,601,776.94	\$15,407,845.39	\$156,630,616.77	\$207,640,239.1
Wholesale Trade	\$352,417,526.22	\$253,630,224.81	\$760,775,545.6	\$1,366,823,296.63
Retail Trade	\$58,553,766.09	\$71,965,147.84	\$1,320,976,116.93	\$1,451,495,030.86
Air Transportation	\$13,468,349.96	\$32,834,624.62	\$191,313,623.52	\$237,616,598.1
Rail Transportation	\$19,201,484.94	\$20,368,548.75	\$45,292,978.25	\$84,863,011.94
Water Transportation	\$6,927,255.77	\$4,705,574.66	\$17,261,849.63	\$28,894,680.07
Truck Transportation	\$79,800,809.5	\$92,721,755.53	\$175,497,516.63	\$348,020,081.66
Transit and Ground Passenger Transportation	\$2,445,585.48	\$6,725,360.41	\$76,041,734.76	\$85,212,680.65
Pipeline Transportation	\$1,069,582.9	\$13,183,887.66	\$26,749,267.15	\$41,002,737.71
Scenic and Sightseeing Transportation and Support Activities for Transportation	\$14,307,051.52	\$42,639,509.41	\$98,156,180.43	\$155,102,741.36
Postal Service and Couriers and Messengers	\$10,897,160.01	\$33,378,208.82	\$91,337,317.74	\$135,612,686.56
Warehousing and Storage	\$1,153,716.56	\$7,916,637.87	\$19,238,874.85	\$28,309,229.29
Motion Picture and Sound Recording Industries	\$1,753,945.3	\$16,543,684.85	\$72,051,520	\$90,349,150.15
Radio and Television Broadcasting	\$4,585,504.15	\$12,360,772.04	\$33,829,049.1	\$50,775,325.29
Publishing, Pay and Specialty TV, Telecommunications, and Other Information Services	\$30,052,719.63	\$140,350,656.29	\$593,424,180.48	\$763,827,556.4

	Direct	Indirect	Induced	Total
Monetary Authorities and Depository Credit Intermediation	\$79,631,726.56	\$84,236,903.57	\$598,501,410.78	\$762,370,040.92
Insurance Carriers	\$23,064,543.81	\$37,279,932.1	\$363,821,044.33	\$424,165,520.24
Lessors of Real Estate	\$18,220,992.12	\$92,348,420.33	\$665,352,490.02	\$775,921,902.47
Owner-Occupied Dwellings	\$-	\$-	\$1,463,562,226.56	\$1,463,562,226.56
Rental and Leasing Services and Lessors of Non-Financial Intangible Assets (except Copyrighted Works)	\$111,309,650.05	\$52,814,068.84	\$134,381,516.87	\$298,505,235.76
Other Finance, Insurance and Real Estate and Management of Companies and Enterprises	\$86,521,275.9	\$164,475,198.13	\$666,241,547.87	\$917,238,021.89
Advertising and Related Services	\$5,509,907.86	\$17,681,794.39	\$47,475,646.24	\$70,667,348.49
Legal, Accounting and Architectural, Engineering and Related Services	\$915,052,887.68	\$136,220,293.02	\$208,315,915.15	\$1,259,589,095.86
Computer Systems Design and Other Professional, Scientific and Technical Services	\$129,668,857.28	\$166,058,373.89	\$296,482,422.51	\$592,209,653.68
Administrative and Support Services	\$37,095,102.38	\$146,137,749.05	\$320,774,430.18	\$504,007,281.6
Waste Management and Remediation Services	\$1,776,845.21	\$18,195,831.72	\$41,811,791.55	\$61,784,468.48
Educational Services (except Universities)	\$2,394,891.97	\$3,094,796.3	\$29,295,585.89	\$34,785,274.16
Health Care Services (except Hospitals) and Social Assistance	\$281,449.37	\$3,835,566.97	\$262,197,184.36	\$266,314,200.69

**Appendix A: Output Impacts by Industry, 2008 Industry Structure,
by Direct, Indirect, Induced and Total Impact Categories (Continued)**

	Direct	Indirect	Induced	Total
Arts, Entertainment and Recreation	\$2,922,970.29	\$13,017,610.13	\$245,550,174.29	\$261,490,754.72
Accommodation and Food Services	\$14,998,879.92	\$51,302,962.54	\$748,399,285.72	\$814,701,128.17
Repair and Maintenance	\$12,890,770.17	\$38,310,590.24	\$152,274,787.37	\$203,476,147.78
Grant-Making, Civic, and Professional and Similar Organizations	\$7,104,557.58	\$10,176,166.76	\$27,684,756.47	\$44,965,480.8
Personal and Laundry Services and Private Households	\$4,485,434.66	\$4,563,171.8	\$174,275,602.36	\$183,324,208.82
Religious Organizations	\$-	\$-	\$65,181,263.22	\$65,181,263.22
Non-Profit Welfare Organizations	\$-	\$-	\$73,819,836.61	\$73,819,836.61
Non-Profit Sports and Recreation Clubs	\$105,716.05	\$450,092.36	\$28,090,914.23	\$28,646,722.63
Other Non-Profit Institutions Serving Households	\$-	\$447,126.01	\$156,861,903.04	\$157,309,029.05
Non-Profit Education Institutions	\$3,387.93	\$72,551.16	\$33,046,899.32	\$33,122,838.41
Hospitals	\$1,053,145.15	\$4,765,672.63	\$44,751,638.13	\$50,570,455.91
Government Residential Care Facilities	\$-	\$68,734.74	\$16,673,689.67	\$16,742,424.41
Universities	\$12,169,956.12	\$4,417,950.18	\$86,187,584.18	\$102,775,490.49
Government Education Services	\$480,019.87	\$2,067,589.89	\$37,210,928.53	\$39,758,538.28
Other Municipal Government Services	\$12,298,195.65	\$21,378,033.77	\$123,013,434.05	\$156,689,663.47
Other Provincial and Territorial Government Services	\$5,840,795.95	\$11,008,104.83	\$52,961,449.9	\$69,810,350.68
Other Federal Government Services	\$7,140,632.79	\$12,968,161.61	\$39,562,731.94	\$59,671,526.34
HHId Income			\$10,463,311,227.77	\$10,463,311,227.77
Total	\$5,189,709,384.04	\$16,370,335,581.24	\$16,815,059,046.28	\$38,375,104,011.56

Appendix B: Employment Impacts by Industry, 2008 Industry Structure

Crop and Animal Production	2,506.50
Forestry and Logging	34.36
Fishing, Hunting and Trapping	6.20
Support Activities for Agriculture and Forestry	49.82
Oil and Gas Extraction	57.32
Coal Mining	466.42
Metal Ore Mining	33.07
Non-Metallic Mineral Mining and Quarrying	390.90
Support Activities for Mining and Oil and Gas Extraction	658.12
Electric Power Generation, Transmission and Distribution	785.75
Natural Gas Distribution, Water, Sewage and Other Systems	846.83
Residential Building Construction	-
Non-residential Building and Engineering Construction	7,981.11
Repair Construction	1,554.90
Other Activities of the Construction Industry	3,434.37
Animal Food Manufacturing	124.34
Sugar and Confectionery Product Manufacturing	156.84
Fruit and Vegetable Preserving and Specialty Food Manufacturing	244.08
Dairy Product Manufacturing	526.65
Meat Product Manufacturing	723.32
Seafood Product Preparation and Packaging	64.00
Miscellaneous Food Manufacturing	863.33
Soft Drink and Ice Manufacturing	124.63
Breweries	168.17
Wineries	78.79
Distilleries	34.65
Tobacco Manufacturing	85.39

**Appendix B: Employment Impacts by Industry,
2008 Industry Structure (Continued)**

Textile and Textile Product Mills	632.31
Clothing Manufacturing	1,088.61
Leather and Allied Product Manufacturing	357.13
Wood Product Manufacturing	262.35
Pulp, Paper and Paperboard Mills	216.47
Converted Paper Product Manufacturing	243.02
Printing and Related Support Activities	1,146.49
Petroleum and Coal Products Manufacturing	226.64
Basic Chemical Manufacturing	285.59
Resin, Synthetic Rubber, and Artificial and Synthetic Fibres and Filaments Manufacturing	211.42
Pesticides, Fertilizer and Other Agricultural Chemical Manufacturing	49.20
Pharmaceutical and Medicine Manufacturing	170.75
Miscellaneous Chemical Product Manufacturing	266.06
Plastic Product Manufacturing	347.80
Rubber Product Manufacturing	99.84
Cement and Concrete Product Manufacturing	437.23
Miscellaneous Non-Metallic Mineral Product Manufacturing	182.19
Primary Metal Manufacturing	2,663.43
Fabricated Metal Product Manufacturing	7,289.59
Machinery Manufacturing	2,598.46
Computer and Peripheral Equipment Manufacturing	400.57
Electronic Product Manufacturing	1,861.30
Household Appliance Manufacturing	337.70
Electrical Equipment and Component Manufacturing	1,937.95
Motor Vehicle Manufacturing	1,479.42
Motor Vehicle Body and Trailer Manufacturing	144.54

Motor Vehicle Parts Manufacturing	1,452.72
Aerospace Product and Parts Manufacturing	99.47
Railroad Rolling Stock Manufacturing	5.48
Ship and Boat Building	18.74
Other Transportation Equipment Manufacturing	125.36
Furniture and Related Product Manufacturing	601.73
Miscellaneous Manufacturing	1,833.91
Wholesale Trade	10,502.93
Retail Trade	27,118.19
Air Transportation	789.92
Rail Transportation	199.16
Water Transportation	23.09
Truck Transportation	1,981.92
Transit and Ground Passenger Transportation	1,671.55
Pipeline Transportation	6.79
Scenic and Sightseeing Transportation and Support Activities for Transportation	1,121.77
Postal Service and Couriers and Messengers	1,842.81
Warehousing and Storage	411.61
Motion Picture and Sound Recording Industries	717.34
Radio and Television Broadcasting	753.46
Publishing, Pay and Specialty TV, Telecommunications, and Other Information Services	2,807.01
Monetary Authorities and Depository Credit Intermediation	2,874.54
Insurance Carriers	1,532.61
Lessors of Real Estate	2,899.51
Owner-Occupied Dwellings	5,468.49
Rental and Leasing Services and Lessors of Non-Financial Intangible Assets (except Copyrighted Works)	6,059.33

Appendix B: Employment Impacts by Industry, 2008 Industry Structure (Continued)

Other Finance, Insurance and Real Estate and Management of Companies and Enterprises	3,578.51
Advertising and Related Services	957.94
Legal, Accounting and Architectural, Engineering and Related Services	17,867.77
Computer Systems Design and Other Professional, Scientific and Technical Services	8,143.47
Administrative and Support Services	7,796.73
Waste Management and Remediation Services	448.78
Educational Services (except Universities)	608.31
Health Care Services (except Hospitals) and Social Assistance	7,717.49
Arts, Entertainment and Recreation	4,920.96
Accommodation and Food Services	16,340.34
Repair and Maintenance	3,139.59
Grant-Making, Civic, and Professional and Similar Organizations	1,293.69
Personal and Laundry Services and Private Households	3,420.56
Religious Organizations	2,119.93
Non-Profit Welfare Organizations	-
Non-Profit Sports and Recreation Clubs	-
Other Non-Profit Institutions Serving Households	-
Non-Profit Education Institutions	536.20
Hospitals	623.25
Government Residential Care Facilities	-
Universities	1,650.92
Government Education Services	634.08
Other Municipal Government Services	1,154.13
Other Provincial and Territorial Government Services	184.03
Other Federal Government Services	541.29
TOTAL	203,533.31

Appendix C: Employment by Occupation, 2008 Industry Structure

SENIOR MANAGEMENT OCCUPATIONS	3,253.14
MIDDLE AND OTHER MANAGEMENT OCCUPATIONS	21,071.74
PROFESSIONAL OCCUPATIONS IN BUSINESS AND FINANCE	7,253.98
SKILLED ADMINISTRATIVE AND BUSINESS OCCUPATIONS	12,563.70
CLERICAL OCCUPATIONS	22,013.63
PROFESSIONAL OCCUPATIONS IN NATURAL AND APPLIED SCIENCES	11,062.79
TECHNICAL OCCUPATIONS RELATED TO NATURAL AND APPLIED SCIENCES	6,907.85
PROFESSIONAL OCCUPATIONS IN HEALTH	2,225.33
TECHNICAL AND SKILLED OCCUPATIONS IN HEALTH	1,475.02
ASSISTING OCCUPATIONS IN SUPPORT OF HEALTH SERVICES	1,748.00
PROFESSIONAL OCCUPATIONS IN SOCIAL SCIENCE, EDUCATION, GOVERNMENT SERVICES AND RELIGION	7,056.49
PARAPROFESSIONAL OCCUPATIONS IN LAW, SOCIAL SERVICES, EDUCATION AND RELIGION	3,060.86
PROFESSIONAL OCCUPATIONS IN ART AND CULTURE	2,523.77
TECHNICAL AND SKILLED OCCUPATIONS IN ART, CULTURE, RECREATION AND SPORT	3,771.07
SKILLED SALES AND SERVICE OCCUPATIONS	10,922.36
INTERMEDIATE SALES AND SERVICE OCCUPATIONS	20,196.24
ELEMENTAL SALES AND SERVICE OCCUPATIONS	18,761.62
TRADES AND SKILLED TRANSPORT AND EQUIPMENT OPERATORS 1	5,948.15
INTERMEDIATE OCCUPATIONS IN TRANSPORT, EQUIPMENT OPERATION, INSTALLATION AND MAINTENANCE	7,255.04
TRADES HELPERS, CONSTRUCTION LABOURERS AND RELATED OCCUPATIONS	4,601.43
SKILLED OCCUPATIONS IN PRIMARY INDUSTRY	2,043.74
INTERMEDIATE OCCUPATIONS IN PRIMARY INDUSTRY	971.06
LABOURERS IN PRIMARY INDUSTRY	1,102.00
PROCESSING, MANUFACTURING AND UTILITIES SUPERVISORS AND SKILLED OPERATORS	1,391.32
PROCESSING AND MANUFACTURING MACHINE OPERATORS AND ASSEMBLERS	10,598.16
LABOURERS IN PROCESSING, MANUFACTURING AND UTILITIES	3,738.06
TOTAL	203,516.56



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