



Economic Impact Assessment

The Saskatchewan Outfitting Industry

October 2018

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EXECUTIVE SUMMARY

Introduction

From its inception, subsistence, and later sport hunting and fishing, was, and is, a key economic driver in Canada. With a diversified eco-system, endless forests, clear and pristine bodies of water, Canada remains a choice and year-round tourist destination for those seeking time spent outdoors. The outfitting industry is comprised of establishments primarily engaged in operating hunting and fishing camps. These businesses provide a range of services, such as access to outpost camps or housekeeping cabins, meals, and guides, and may also provide transportation to the facility, sale of food, beverages, and hunting and fishing supplies.

The outfitting industry is a significant economic driver across Canada, helping to power tourism and the economy. Outfitting is often a packaged tourism experience, and it generates tourism revenue often during off-peak seasons, and often in regions of Canada that are typically experience limited leisure or independent tourist visits. A high percentage of outfitted visitors are non-resident, as they are visiting from out of country. In order to provide the packaged outfitted experience, outfitters purchase gear, trucks and boats, gas and food, and provide accommodation at their own camps and lodges, as well as local motels and hotels. These expenditures then ripple through the economy generating more impact through purchases of supplies and labour.

In Saskatchewan, the province's northern forest area is widely inhabited by white-tailed deer, moose and black bears and 100,000 lakes and rivers to sport trophy pike, walleye, and trout. In the southern part of the province, upland and waterfowl populate the prairie landscape.

Guiding the industry in the province is the Saskatchewan Commission of Professional Outfitters (SCPO), an industry-driven, not-for-profit association made up of licensed professional outfitters. Praxis Consulting has been contracted by SPCO to estimate the economic value of the outfitting industry to the Saskatchewan economy.

Summary of Results

In the 2017 calendar year, it was estimated the outfitting industry operations added \$126.4M to Provincial Gross Domestic Product (GDP), \$84.4M to local GDP and created 5,144 jobs provincially and 4,041 jobs in northern Saskatchewan. Total estimated government revenues were \$12M Federally and \$12.3M Provincially.

Cumulative industry investment was estimated to add \$186.3M to Provincial Gross Domestic Product (GDP), \$100.2M to local GDP and create 1,507 person years of employment provincially and 626 person years in northern Saskatchewan. Total estimated government revenues are \$26.4M Federally and \$16.8M Provincially.

Roughly 1 in every 111 jobs in Saskatchewan is dependent directly or indirectly on the operations of the outfitting industry. In northern Saskatchewan, the dependence is even more striking with 1 in every 17 jobs depending directly or indirectly on the outfitting industry.

Results below are the sum of direct, indirect, and induced impacts for both industry operations and capital investment of the outfitting industry in 2017 dollars. All impacts are considered incremental to the Base Case (no industry) scenario.

Direct impact is the total initial expenditure, usually construction or operating outlays. Indirect impact is the secondary impact that includes inter-industry transactions: purchases of inputs from supporting industries. Induced impact is the additional impact from changes in household spending as industries modify labour input requirements in response to altered levels of demand for output. Gross Domestic Product (GDP) measures net economic activity within a prescribed geographic area; representing the payments made to final factors of production: labour, unincorporated business profits, and other operating surplus (corporate profits, interest income, inventory valuation adjustments, and capital consumption allowances). Gross domestic product excludes the value of intermediate goods and services used in production. Labour income includes wages, salaries, and employer contributions to pensions and benefit packages.

Table 1: Summary of 2017 Provincial Impacts – Industry Operations

| Provincial Impacts | Gross Domestic Product (\$M) | Employment (Positions) | Labour Income (\$M) |
|----------------------------|------------------------------|------------------------|---------------------|
| Industry Operations | 126.4 | 5144 | 25.6 |

Table 2: Summary of Cumulative Provincial Impacts – Industry Investment

| Provincial Impacts | Gross Domestic Product (\$M) | Employment (Person Years) | Labour Income (\$M) |
|-------------------------------|------------------------------|---------------------------|---------------------|
| New Capital Investment | 186.3 | 1507 | 85.2 |

Table 3: Summary of 2017 Northern Saskatchewan Impacts – Industry Operations

| Northern Saskatchewan Impacts | Gross Domestic Product (\$M) | Employment (Positions) | Labour Income (\$M) |
|-------------------------------|------------------------------|------------------------|---------------------|
| Industry Operations | 84.4 | 4041 | 10.8 |

Table 4: Summary of Cumulative Northern Saskatchewan Impacts – Industry Investment

| Northern Saskatchewan Impacts | Gross Domestic Product (\$M) | Employment (Person Years) | Labour Income (\$M) |
|-------------------------------|------------------------------|---------------------------|---------------------|
| New Capital Investment | 100.2 | 626 | 41.7 |

INTRODUCTION

The Outfitting Industry in Saskatchewan

From its inception, subsistence, and later sport, hunting and fishing, was, and is, a key economic driver in Canada. With a diversified eco-system, endless forests, clear and pristine bodies of water, Canada remains a choice and year-round tourist destination for those seeking time spent outdoors. The outfitting industry is comprised of establishments primarily engaged in operating hunting and fishing camps. These businesses provide a range of services, such as access to outpost camps or housekeeping cabins, meals and guides, and may also provide transportation to the facility, sale of food, beverages, and hunting and fishing supplies. In addition, outfitters provide clients with accommodation, select areas by the animals their visitors want to hunt or they can organize a tour depending on the territories their customers want to visit. Also, for non-residents, hiring an outfitter may be the only way to access hunting on some territories or some specific kinds of animals. For example, in the arctic, in order to hunt a polar bear, a sport hunter must buy a tag from one of the communities and hire a local guide.

The outfitting industry is a significant economic driver across Canada, helping to power tourism and the economy. Outfitting is often a packaged tourism experience, and it generates tourism revenue often during off-peak seasons, and often in regions of Canada that are typically experience limited leisure or independent tourist visits. A high percentage of outfitted visitors are non-resident, as they are visiting from out of country. In order to provide the packaged outfitted experience, outfitters purchase gear, trucks and boats, gas and food, and provide accommodation at their own camps and lodges, as well as local motels and hotels. These expenditures then ripple through the economy generating more impact through purchases of supplies and labour.

In Saskatchewan, the province's northern forest area is a widely inhabited by white-tailed deer, moose and black bears and 100,000 lakes and rivers sport trophy pike, walleye, and trout. In the southern part of the province, upland and waterfowl populate the prairie landscape. Outfitting in Saskatchewan has the potential to grow, particularly from the US market due to a favorable exchange rate, a first-class outdoor experience in the province, and to the geographic closeness Canada and the province shares with many American outdoor enthusiasts.

Guiding the outfitting industry in the province is the Saskatchewan Commission of Professional Outfitters (SCPO), an industry-driven, not-for-profit association made up of licensed professional outfitters. SCPO was incorporated in February of 2017 as an "industry-led outfitting commission" and its mission is to work in partnership with the provincial government and other stakeholders to ensure a healthy and sustainable outfitting industry exists in Saskatchewan. The members of SCPO are professionals, knowledgeable in the terrain, the weather, and the habits of local fish and game, ensuring an unrivaled guest experience.

METHODOLOGY

To estimate the outfitting industry's benefits, separate economic models were employed for Saskatchewan and Northern Saskatchewan using the latest provincial input-output (IO) tables available. An IO table is a means of presenting a detailed analysis of the process of production, the use of goods and services (products), and the income generated in that production. The Saskatchewan model is rectangular in nature with 35 industries and 66 commodities and based on Statistics Canada's standardized methodology. The Saskatchewan model will yield results similar to Statistics Canada's inter-provincial model and the Conference Board of Canada's STEAM Model. Model description and definitions are available in Appendix A.

Key to this analysis was the estimation of impacts at the regional level for Northern Saskatchewan (license zones C, E, F and L) corresponding roughly to Census Divisions 14, 16, 17, and 18. Regional level impacts were estimated by constructing a separate economic impact model for the region using regional employment by industry to estimate regional output, a community hierarchy model to assess regional trade flows and leakages, and re-balancing to ensure model cohesiveness. The Northern model is a square model with 25 industries. A detailed discussion of the regional (community) IO models is available in Appendix B.

Potential economic impacts of the outfitting industry were estimated across the following 3 dimensions:

1. Industry operating costs including wages and employment;
2. Industry investment in smaller equipment (less than \$10,000 per unit);
3. Industry investment in larger equipment and building (more than \$10,000 per unit);

A survey of SCPO members was undertaken to gather the information required for the economic analysis. The survey asked members to disclose information regarding operating costs, revenues, employment, capitals spending, and other issues of concern to the industry. Survey results provided a large portion of economic model inputs.

Industry operational impacts were calculated by creating a mixed endogenous–exogenous model. This approach allows modification of the input structure of the expanding industry to reflect the output and input structure of a new development or event. This approach is appropriate when the input structure of the new differs significantly from the input structure of the impacted industry. The directly impacted industry in this portion of the study was the accommodation and food services industry. The labour income and employment coefficient in the model was adjusted to reflect estimated employment and income paid to labour provided by the project proponent. Under this approach, gross revenues are treated as industry gross output and expenses are assigned to either inter-industry purchases or final value-added (wages, amortization, and profits). A detailed account of the mixed endogenous–exogenous model methodology is available in Appendix C.

Capital spending impacts were based on allocating investment survey results across the default industry mix of construction and machinery and equipment investment in the Saskatchewan and northern Saskatchewan economic models. Model outputs for Saskatchewan and northern Saskatchewan are gross domestic product, employment, labour income, and federal and provincial tax revenues by type. Provincial results are available at the 35 industry level of detail but were aggregated to 25 industries to provide comparisons with northern Saskatchewan results.

DETAILED RESULTS

Survey results were scaled up by a factor of 4.2824 (the ratio of total number of active outfitters in the province (625 less 163 inactive) to survey respondents (108)). All impacts are considered incremental to the Base Case (no outfitting industry) scenario. Capital Investment and operation impacts are presented separately. Impacts are presented in terms of gross domestic product at basic prices, employment, and labour income.

Gross domestic product measures net economic activity within a prescribed geographic area. It represents the payments made to final factors of production: labour, unincorporated business profits, and other operating surplus (corporate profits, interest income, inventory valuation adjustments, and capital consumption allowances). Gross domestic product excludes the value of intermediate goods and services used in production.

Capital investment employment is cumulative and is measured in person years (PYs). Operational and capital indirect and induced employment and is measured in positions and includes a mix of both full and part-time positions. Labour income includes wages, salaries, and employer contributions to pensions and benefit packages. Impacts are presented for northern Saskatchewan, the province as a whole, and the rest of the province outside of the northern region (ROP).

With the bulk of outfitting activity occurring in northern Saskatchewan, the impact of southern based outfitters was not estimated separately. This also precludes the possibility of double counting indirect and induced impacts. Instead, the impact of southern outfitters are included in ROP impacts.

Industry Operation Impact

2017 industry operation impacts include purchases from other industries primarily transport and warehousing, professional services, finance and insurance, manufactured goods, wages and salaries, and profits. Survey results included percentages of total non-wage expenditures spent on the following categories: rent/lease vehicles and equipment, rent/lease land and buildings, fuel and oil, food and groceries, small equipment, insurance, lodging and accommodations, marketing and advertising, air charters, and “other”. Expenditures were assigned to the appropriate industry in the economic models and “other” was allocated across the remaining industry breakdown for the detailed IO industry of “recreational vehicle parks, recreational camps, and rooming and boarding houses”, which includes outfitting. Default model ratios of provincially and locally sourced inputs were also employed. Results of the model run are displayed below.

Table 5: Industry Operations Impact - Province

| Gross Domestic Product (\$M) | |
|-------------------------------------|-------|
| Direct | 71.8 |
| Indirect | 16.8 |
| Induced | 37.8 |
| Total Gross Domestic Product | 126.4 |
| Employment (Positions) | |
| Direct | 4702 |
| Indirect | 99 |
| Induced | 343 |
| Total Employment | 5144 |
| Labour Income (\$M) | |
| Direct | 4.6 |
| Indirect | 5.7 |
| Induced | 15.4 |
| Total Labour Income | 25.6 |

Table 6: Industry Operations Impact – Northern Saskatchewan

| Gross Domestic Product (\$M) | |
|-------------------------------------|------|
| Direct | 65.6 |
| Indirect | 7.9 |
| Induced | 10.9 |
| Total Gross Domestic Product | 84.4 |
| Employment (Positions) | |
| Direct | 3931 |
| Indirect | 49 |
| Induced | 61 |
| Total Employment | 4041 |
| Labour Income (\$M) | |
| Direct | 4.3 |
| Indirect | 2.9 |
| Induced | 3.5 |
| Total Labour Income | 10.8 |

Table 7: Industry Operations Impact - ROP

| | |
|-------------------------------------|------|
| Gross Domestic Product (\$M) | |
| Direct | 6.1 |
| Indirect | 8.9 |
| Induced | 26.9 |
| Total Gross Domestic Product | 42.0 |
| Employment (Positions) | |
| Direct | 771 |
| Indirect | 49 |
| Induced | 283 |
| Total Employment | 1103 |
| Labour Income (\$M) | |
| Direct | 0.3 |
| Indirect | 2.8 |
| Induced | 11.8 |
| Total Labour Income | 14.9 |

Investment Impacts

Investment impacts were estimated by allocating total investment (both less than \$10,000 per unit cost and greater than \$10,000 per unit cost) of \$292.9 million across the average Saskatchewan and northern Saskatchewan construction and machinery industry breakdown. Investment is considered cumulative across the tenure of the current operator and is not for any specific year of operation. Leakages, largely from imported goods and services, were industry averages for both Saskatchewan and northern Saskatchewan. Direct employment was model generated. Results of the model run are displayed below.

Table 8: Investment Impact - Province

| | |
|-------------------------------------|-------|
| Gross Domestic Product (\$M) | |
| Direct | 94.4 |
| Indirect | 47.3 |
| Induced | 44.6 |
| Total Gross Domestic Product | 186.3 |
| Employment (Person Years) | |
| Direct | 748 |
| Indirect | 305 |
| Induced | 454 |
| Total Employment | 1507 |
| Labour Income (\$M) | |
| Direct | 49.5 |
| Indirect | 16.9 |
| Induced | 18.8 |
| Total Labour Income | 85.2 |

Table 9: Investment Impact – Northern Saskatchewan

| Gross Domestic Product (\$M) | |
|-------------------------------------|-------|
| Direct | 68.8 |
| Indirect | 23.7 |
| Induced | 7.7 |
| Total Gross Domestic Product | 100.2 |
| Employment (Person Years) | |
| Direct | 486 |
| Indirect | 98 |
| Induced | 43 |
| Total Employment | 626 |
| Labour Income (\$M) | |
| Direct | 32.7 |
| Indirect | 6.5 |
| Induced | 2.5 |
| Total Labour Income | 41.7 |

Table 10: Investment Impact - ROP

| Gross Domestic Product (\$M) | |
|-------------------------------------|------|
| Direct | 25.5 |
| Indirect | 23.6 |
| Induced | 36.9 |
| Total Gross Domestic Product | 86.1 |
| Employment (Person Years) | |
| Direct | 262 |
| Indirect | 207 |
| Induced | 412 |
| Total Employment | 881 |
| Labour Income (\$M) | |
| Direct | 16.8 |
| Indirect | 10.4 |
| Induced | 16.3 |
| Total Labour Income | 43.5 |

Detailed Impacts by Industry

Impacts of the outfitting industry on the provincial and northern economy are pervasive and wide spread. Table 11 and Table 12 provide total annual impacts (direct, indirect, and induced) by industry of industry operation on the provincial and northern economy in 2017. The bulk of total and direct activity occurs within the accommodation and food service industry. Indirect impacts (industries providing inputs to the accommodation and food service industry) are concentrated in professional services, transportation and warehousing and other services industries. Induced impacts, which represent the additional impacts of consumer spending of wages earned are concentrated in trade and personal services.

Table 13 and Table 14 provide total cumulative impacts (sum of direct, indirect, and induced) by industry of investment on the provincial and northern economies. The bulk of direct activity occurs within the construction industry itself, but further impacts occur within the manufacturing industry. Indirect impacts are observed in the industries providing inputs to the construction industries: manufacturing, professional and technical services and financial services. Induced impacts, which represent the additional impacts of consumer spending of wages earned, is concentrated heavily within the retail trade and service industries.

Table 11: Impacts by Industry – Province - Operations

| Impacts by Industry – Province – Industry Operations | Gross Output Impact (\$M) | GDP at Basic Prices Impact (\$M) | Employment Impact (Positions) | Labour Income Impact (\$M) |
|--|---------------------------|----------------------------------|-------------------------------|----------------------------|
| Crop and Animal Production | 1.5 | 0.5 | 4 | 0.1 |
| Forestry and Logging | 0.1 | 0.0 | 0 | 0.0 |
| Fishing, Hunting and Trapping | 0.0 | 0.0 | 0 | 0.0 |
| Support Activities for Agriculture and forestry | 0.0 | 0.0 | 0 | 0.0 |
| Mining and Oil and Gas Extraction | 2.7 | 1.8 | 2 | 0.3 |
| Utilities | 3.4 | 2.1 | 4 | 0.5 |
| Construction | 2.1 | 0.8 | 7 | 0.4 |
| Manufacturing | 8.7 | 2.3 | 15 | 1.0 |
| Wholesale Trade | 2.6 | 1.7 | 11 | 0.7 |
| Retail Trade | 10.0 | 6.5 | 136 | 4.5 |
| Transportation and Warehousing | 8.8 | 4.7 | 37 | 2.2 |
| Information and Cultural Industries | 2.8 | 1.6 | 12 | 0.8 |
| Finance, Insurance, Real Estate and Rental and Leasing | 33.9 | 23.3 | 72 | 4.5 |
| Professional, Scientific and Technical Services | 3.8 | 2.5 | 24 | 1.4 |
| Administrative and Support, Waste Management and Remediation Services | 1.1 | 0.7 | 14 | 0.5 |
| Educational Services | 0.2 | 0.1 | 3 | 0.1 |
| Health Care and Social Assistance | 2.0 | 1.3 | 16 | 0.5 |
| Arts, Entertainment and Recreation | 1.1 | 0.5 | 14 | 0.4 |
| Accommodation and Food Services | 128.5 | 71.8 | 4702 | 4.6 |
| Other Services (Except Public Administration) | 2.1 | 1.4 | 29 | 0.9 |
| Operating, Office, Cafeteria and Laboratory Supplies | 0.0 | 0.0 | 0 | 0.0 |
| Travel, Entertainment, Advertising and Promotion | 0.0 | 0.0 | 0 | 0.0 |

| Impacts by Industry – Province – Industry Operations | Gross Output Impact (\$M) | GDP at Basic Prices Impact (\$M) | Employment Impact (Positions) | Labour Income Impact (\$M) |
|--|---------------------------|----------------------------------|-------------------------------|----------------------------|
| Transportation Margins | 0.0 | 0.0 | 0 | 0.0 |
| Non-Profit Institutions Serving Households | 0.7 | 0.4 | 12 | 0.4 |
| Government Sector | 3.7 | 2.4 | 29 | 2.0 |
| Total | 220.0 | 126.4 | 5144 | 25.6 |

Table 12: Impacts by Industry – Northern Saskatchewan - Operations

| Impacts by Industry – Northern Saskatchewan – Industry Operations | Gross Output Impact (\$M) | GDP at Basic Prices Impact (\$M) | Employment Impact (Positions) | Labour Income Impact (\$M) |
|--|---------------------------|----------------------------------|-------------------------------|----------------------------|
| Crop and Animal Production | 0.1 | 0.0 | 0 | 0.0 |
| Forestry and Logging | 0.0 | 0.0 | 0 | 0.0 |
| Fishing, Hunting and Trapping | 0.0 | 0.0 | 0 | 0.0 |
| Support Activities for Agriculture and forestry | 0.0 | 0.0 | 0 | 0.0 |
| Mining and Oil and Gas Extraction | 1.8 | 1.2 | 1 | 0.2 |
| Utilities | 2.2 | 1.4 | 3 | 0.3 |
| Construction | 0.8 | 0.3 | 3 | 0.2 |
| Manufacturing | 3.0 | 0.8 | 5 | 0.4 |
| Wholesale Trade | 0.7 | 0.5 | 3 | 0.2 |
| Retail Trade | 0.0 | 0.0 | 0 | 0.0 |
| Transportation and Warehousing | 6.6 | 3.5 | 28 | 1.6 |
| Information and Cultural Industries | 0.7 | 0.4 | 3 | 0.2 |
| Finance, Insurance, Real Estate and Rental and Leasing | 11.1 | 7.6 | 24 | 1.5 |
| Professional, Scientific and Technical Services | 2.0 | 1.3 | 13 | 0.7 |
| Administrative and Support, Waste Management and Remediation Services | 0.3 | 0.2 | 4 | 0.1 |
| Educational Services | 0.0 | 0.0 | 0 | 0.0 |
| Health Care and Social Assistance | 0.7 | 0.4 | 5 | 0.2 |
| Arts, Entertainment and Recreation | 0.0 | 0.0 | 0 | 0.0 |
| Accommodation and Food Services | 118.8 | 65.6 | 3931 | 4.3 |
| Other Services (Except Public Administration) | 0.4 | 0.3 | 6 | 0.2 |
| Operating, Office, Cafeteria and Laboratory Supplies | 0.0 | 0.0 | 0 | 0.0 |
| Travel, Entertainment, Advertising and Promotion | 0.0 | 0.0 | 0 | 0.0 |

| Impacts by Industry – Northern Saskatchewan – Industry Operations | Gross Output Impact (\$M) | GDP at Basic Prices Impact (\$M) | Employment Impact (Positions) | Labour Income Impact (\$M) |
|---|---------------------------|----------------------------------|-------------------------------|----------------------------|
| Transportation Margins | 0.0 | 0.0 | 0 | 0.0 |
| Non-Profit Institutions Serving Households | 0.2 | 0.1 | 2 | 0.1 |
| Government Sector | 1.1 | 0.7 | 9 | 0.6 |
| Total | 150.6 | 84.4 | 4041 | 10.8 |

Table 13: Impacts by Industry - Province - Investment

| Impacts by Industry – Province – Industry Investment | Gross Output Impact (\$M) | GDP at Basic Prices Impact (\$M) | Employment Impact (Person Years) | Labour Income Impact (\$M) |
|--|---------------------------|----------------------------------|----------------------------------|----------------------------|
| Crop and Animal Production | 3.6 | 1.3 | 10 | 0.1 |
| Forestry and Logging | 0.2 | 0.1 | 1 | 0.0 |
| Fishing, Hunting and Trapping | 0.0 | 0.0 | 0 | 0.0 |
| Support Activities for Agriculture and forestry | 0.1 | 0.1 | 1 | 0.0 |
| Mining and Oil and Gas Extraction | 32.6 | 21.5 | 27 | 3.0 |
| Utilities | 4.8 | 3.0 | 6 | 0.7 |
| Construction | 203.7 | 76.5 | 645 | 42.4 |
| Manufacturing | 24.1 | 6.4 | 42 | 2.9 |
| Wholesale Trade | 12.2 | 8.0 | 50 | 3.4 |
| Retail Trade | 13.8 | 8.9 | 189 | 6.2 |
| Transportation and Warehousing | 7.5 | 4.0 | 32 | 1.8 |
| Information and Cultural Industries | 4.7 | 2.6 | 21 | 1.3 |
| Finance, Insurance, Real Estate and Rental and Leasing | 39.4 | 27.0 | 84 | 5.2 |
| Professional, Scientific and Technical Services | 15.3 | 9.9 | 97 | 5.5 |
| Administrative & Support, Waste Management & Remediation Services | 2.7 | 1.6 | 34 | 1.1 |
| Educational Services | 0.2 | 0.2 | 4 | 0.1 |
| Health Care and Social Assistance | 2.7 | 1.7 | 21 | 0.7 |
| Arts, Entertainment and Recreation | 1.4 | 0.7 | 17 | 0.5 |
| Accommodation and Food Services | 5.0 | 2.4 | 78 | 1.8 |
| Other Services (Except Public Administration) | 2.9 | 1.9 | 40 | 1.2 |
| Operating, Office, Cafeteria and Laboratory Supplies | 0.0 | 0.0 | 0 | 0.0 |
| Travel, Entertainment, Advertising and Promotion | 0.0 | 0.0 | 0 | 0.0 |

| Impacts by Industry – Province – Industry Investment | Gross Output Impact (\$M) | GDP at Basic Prices Impact (\$M) | Employment Impact (Person Years) | Labour Income Impact (\$M) |
|--|---------------------------|----------------------------------|----------------------------------|----------------------------|
| Transportation Margins | 0.0 | 0.0 | 0 | 0.0 |
| Non-Profit Institutions Serving Households | 1.1 | 0.6 | 16 | 0.6 |
| Government Sector | 12.1 | 7.9 | 94 | 6.5 |
| Total | 390.1 | 186.3 | 1507 | 85.2 |

Table 14: Impacts by Industry - Northern Saskatchewan - Investment

| Impacts by Industry – Northern Saskatchewan - Industry Investment | Gross Output Impact (\$M) | GDP at Basic Prices Impact (\$M) | Employment Impact (Person Years) | Labour Income Impact (\$M) |
|--|---------------------------|----------------------------------|----------------------------------|----------------------------|
| Crop and Animal Production | 0.1 | 0.0 | 0 | 0.0 |
| Forestry and Logging | 0.0 | 0.0 | 0 | 0.0 |
| Fishing, Hunting and Trapping | 0.0 | 0.0 | 0 | 0.0 |
| Support Activities for Agriculture and forestry | 0.0 | 0.0 | 0 | 0.0 |
| Mining and Oil and Gas Extraction | 41.7 | 27.6 | 34 | 3.8 |
| Utilities | 2.2 | 1.4 | 3 | 0.3 |
| Construction | 134.5 | 50.5 | 426 | 28.0 |
| Manufacturing | 6.9 | 1.8 | 12 | 0.8 |
| Wholesale Trade | 2.6 | 1.7 | 11 | 0.7 |
| Retail Trade | 0.0 | 0.0 | 0 | 0.0 |
| Transportation and Warehousing | 3.5 | 1.9 | 15 | 0.9 |
| Information and Cultural Industries | 0.8 | 0.4 | 3 | 0.2 |
| Finance, Insurance, Real Estate and Rental and Leasing | 8.8 | 6.0 | 19 | 1.2 |
| Professional, Scientific and Technical Services | 7.3 | 4.7 | 46 | 2.6 |
| Administrative and Support, Waste Management and Remediation Services | 0.9 | 0.6 | 11 | 0.4 |
| Educational Services | 0.0 | 0.0 | 0 | 0.0 |
| Health Care and Social Assistance | 0.6 | 0.4 | 4 | 0.1 |
| Arts, Entertainment and Recreation | 0.0 | 0.0 | 0 | 0.0 |
| Accommodation and Food Services | 0.0 | 0.0 | 0 | 0.0 |
| Other Services (Except Public Administration) | 0.4 | 0.3 | 6 | 0.2 |
| Operating, Office, Cafeteria and Laboratory Supplies | 0.0 | 0.0 | 0 | 0.0 |
| Travel, Entertainment, Advertising and Promotion | 0.0 | 0.0 | 0 | 0.0 |

| Impacts by Industry – Northern Saskatchewan - Industry Investment | Gross Output Impact (\$M) | GDP at Basic Prices Impact (\$M) | Employment Impact (Person Years) | Labour Income Impact (\$M) |
|---|---------------------------|----------------------------------|----------------------------------|----------------------------|
| Transportation Margins | 0.0 | 0.0 | 0 | 0.0 |
| Non-Profit Institutions Serving Households | 0.2 | 0.1 | 2 | 0.1 |
| Government Sector | 4.3 | 2.8 | 33 | 2.3 |
| Total | 214.9 | 100.2 | 626 | 41.7 |

Government Fiscal Impacts

An expansion in economic activity is expected to generate incremental government revenues. The economic impact model's fiscal module is based on the latest provincial and federal budgets and estimates government revenues as follows:

- Provincial personal income tax is calculated by using the provincial personal income tax rate that would apply to average industry annual income. This is applied to model-generated labour income.
- Federal personal income tax is calculated by using the federal personal income tax rate that would apply to average industry annual income applied to model-generated labour income.
- Corporation income tax is calculated by applying the respective provincial and federal corporate tax rate to incremental corporate profits before taxes calculated by the model.
- Unincorporated business income taxes are calculated by applying the small business tax rate to incremental unincorporated business profits calculated by the model.
- Federal and Provincial sales taxes collected on goods are calculated using an estimated split of federal provincial taxes applied to model generated indirect taxes on products. All model generated indirect taxes on services are considered federal sales and excise tax revenues.

Table 15: Summary of Cumulative Fiscal Impacts – Industry Capital Investment

| Government Revenue Impacts - Industry Investment | Personal Income Tax (PIT) | Corporate Income Tax | Taxes Unincorporated Business Profits | Sales and Excise Taxes | Total Revenue |
|--|---------------------------|----------------------|---------------------------------------|------------------------|---------------|
| Federal (\$M) | 18.1 | 3.2 | 4.2 | 1.0 | 26.4 |
| Provincial (\$M) | 9.8 | 2.5 | 3.0 | 1.5 | 16.8 |
| Total (\$M) | 27.8 | 5.7 | 7.2 | 2.4 | 43.1 |

Table 16: Summary of Annual Fiscal Impacts – Operations

| Government Revenue Impacts - Operations | Personal Income Tax (PIT) | Corporate Income Tax | Taxes Unincorporated Business Profits | Sales and Excise Taxes | Total Revenue |
|---|---------------------------|----------------------|---------------------------------------|------------------------|---------------|
| Federal (\$M) | 4.3 | 0.8 | 6.2 | 0.7 | 12.0 |
| Provincial (\$M) | 2.8 | 0.6 | 4.6 | 4.4 | 12.3 |
| Total (\$M) | 7.1 | 1.4 | 10.8 | 5.1 | 24.3 |

Estimated government revenues are for direct, indirect, and induced impacts and do not represent solely the industry's taxes paid. Estimates are not adjusted for any changes to equalization entitlements.

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APPENDIX A: DEFINITIONS AND MODEL DESCRIPTION

Direct Impact: total project expenditure, usually construction or operating outlays.

Employment: measured in positions.

Final Demand: sum of personal expenditure, government purchases of goods and services, business and government investment, and net exports.

GDP at factor cost: measure of net economic activity within a prescribed geographic area. It represents the payments made to final factors of production: labour, unincorporated business profits, and other operating surplus (corporate profits, interest income, inventory valuation adjustments, and capital consumption allowances). GDP at factor cost excludes the value of intermediate goods and services used in production.

GDP at market prices: GDP at factor cost plus indirect taxes less subsidies.

Gross Output: total expenditures on local goods and services as well as payments to labour and business profits. Gross output includes double counting because it includes the value of inputs used in production rather than net value added alone.

Indirect Impact: the secondary impact that includes inter-industry transactions, purchases of inputs from supporting industries

Induced impact: the additional impact from changes in household spending as industries modify labour input requirements in response to altered levels of demand for output.

Industry outputs are calculated as $(I-D(I-\mu-\alpha-\beta)B)^{-1}D((I-\mu-\alpha-\beta)e^*+(I-\mu-\beta)X_d+(I-\mu)X_r)=X$

Where:

I = an identity matrix of industry by industry dimension

D = a matrix of coefficients representing commodity output proportions

B = a matrix of coefficients representing commodity input proportions (technical coefficients) by industry

μ = a diagonal matrix whose elements represent the ratio of imports to use

α = a diagonal matrix whose elements represent the ratio of government production to use

β = a diagonal matrix whose elements represent the ratio of inventory withdrawals to use

e^* = final demand categories of consumption, government purchases of goods and services, business and government investment, and inventory additions.

X_d = final demand category of domestic exports

X_r = final demand category of re-exports.

Employment is calculated as a fixed number of positions per dollar of industry output.

APPENDIX B: DEVELOPING COMMUNITY LEVEL INPUT-OUTPUT MODELS

The latest available provincial input-output tables at the S-Level from Statistics Canada were used as the starting point. The table represents 25 industries and 18 components of final demand (based on the 2014 S-level aggregation). The tables were converted into industry-by-industry space.

In a square input-output table, each industry in the table can be represented as a column. For example industry 1 can be represented as follows:

| |
|-----------|
| Z_{11} |
| Z_{12} |
| . |
| . |
| . |
| Z_{125} |
| W_1 |
| X_1 |

z_{ij} = purchases by industry i of products from industry j . The transactions matrix consists of z_{11} to z_{2525} comprise the transactions matrix of 625 (25 x 25) elements.

W_1 = value added or gross domestic product component of industry 1's output which includes wages, salaries, supplementary labour income, unincorporated business profits, incorporate income profits, other income, and depreciation.

X_1 = industry 1's total output, which equals W_1 plus the sum of z_{11} to z_{25} .

To create sub-provincial models, four challenges must be overcome:

1. Allocation of provincial gross output by community/region
2. Estimation of technical coefficients by industry at a community/regional level
3. Estimation of components of gross domestic product by industry at a community/regional level
4. Allocation of provincial final demand output by community/region.

Census data on labour force by industry will be used to allocate gross output by industry for the region/community. Regional gross output for industry i is estimated:

$$X_i^R = \text{Labour Force}_i^R / \text{Labour Force}_{i}^{\text{Sk}} \times X_i^{\text{Sk}}$$

Where:

X_i^R = regional gross output for industry i

Labour Force_i^R = regional labour force for industry i

$\text{Labour Force}_{i}^{\text{Sk}}$ = provincial labour force for industry i

X_i^{Sk} = provincial gross output for industry i

To estimate items in each regional transaction matrix (z_{ij}) it will be assumed in all cases that the provincial input structure will apply to regional industries. The components of the regional transaction matrix are estimated:

$$z_{ij}^R = z_{ij}^{\text{Sk}} / X_i^{\text{Sk}} \times X_i^R$$

Where:

z_{ij}^R = an element of the regional transactions matrix.

z_{ij}^{Sk} = the corresponding element of the provincial transactions matrix.

The same methodology is used for estimating the components of GDP.

$$W_i^R = W_i^{\text{Sk}} / X_i^{\text{Sk}} \times X_i^R$$

Where:

W_i^R = regional value added or gross domestic product component of industry i's output

W_i^{Sk} = provincial value added or gross domestic product component of industry i's output

The components of final demand are estimated as follows. Personal expenditures are based on a per capita allocation of provincial spending.

$$PE_i^R = PE_i^{\text{Sk}} / \text{Pop}^{\text{Sk}} \times \text{Pop}^R$$

Where:

PE^R_i = Regional personal expenditure on industry i 's output

PE^{Sk}_i = Provincial personal expenditure on industry i 's output

Pop^{Sk} = Provincial population

Pop^R = Regional population

Gross capital formation (GFCF) or investment by industry is estimated applying the regional share industry to total provincial gross capital formation for each industry. The same approach is used to estimate exports (Xd), imports (M), and inventory changes by industry (VPC)

$$GFCF^R_i = X^R_i / X^{Sk}_i \times GFCF^{Sk}_i$$

$$Xd^R_i = X^R_i / X^{Sk}_i \times Xd^{Sk}_i$$

$$M^R_i = X^R_i / X^{Sk}_i \times M^{Sk}_i$$

$$VPC^R_i = X^R_i / X^{Sk}_i \times VPC^{Sk}_i$$

Where:

$GFCF^R_i$ = Regional investment spending on industry i 's output.

$GFCF^{Sk}_i$ = Provincial investment spending on industry i 's output

Xd^R_i = Regional exports of industry i 's output

Xd^{Sk}_i = Provincial exports of industry i 's output

M^R_i = Regional imports of industry i 's output

M^{Sk}_i = Provincial imports of industry i 's output

VPC^R_i = Regional inventory changes of industry i 's output

VPC^{Sk}_i = Provincial inventory changes of industry i 's output

Regional public administration employment is used to allocate provincial government current expenditures by region.

$$GCE^R_i = PAE^R / PAE^{Sk} \times GCE^{Sk}_i$$

Where:

GCE^R_i = Regional government current expenditures on industry i's output

PAE^R = Regional public administration labour force

PAE^{Sk} = Provincial public administration labour force

GCE^{Sk}_i = Provincial government current expenditures on industry i's output

It is also necessary to adjust for leakages for intra-provincial imported factors of production.

These are estimated residually: If the sum of the use (both Final Demand and Inter-industry sales) of industry i's output is less than X_i then, intra-provincial exports are used to balance. Similarly, if use is greater than X_i intra-provincial imports are used the balance.

Intra-provincial exports/imports and exports due to out-shopping are estimated by calculating the marginal propensity to out-shop (the ratio of major community per capita retail sales to provincial per capita retail sales and multiplying by PE. Imports and exports are adjusted by this amount.

The estimation of intra-provincial imports into a region/community and incorporation of intra-provincial imports into the region/community model's leakages will constrain local multipliers to values not exceeding provincial level multipliers.

Developing Community/Regional Impact Models

Industry outputs in response to a shock in final demand are calculated as $(I - (I - \mu - \alpha - \beta)A)^{-1}((I - \mu - \alpha - \beta)e^* + (I - \mu - \beta)X_d + (I - \mu)X_r) = X$

Where:

I = an identity matrix of industry by industry dimension

A = a matrix of technical coefficients representing inter-industry purchases (z_{ij}) divided by own industry gross output X_i .

μ = a diagonal matrix whose elements represent the ratio of imports to use

α = a diagonal matrix whose elements represent the ratio of government production to use

β = a diagonal matrix whose elements represent the ratio of inventory withdrawals to use

e^* = final demand categories of consumption, government purchases of goods and services, business and government investment, and inventory additions.

X_d = final demand category of domestic exports

X_r = final demand category of re-exports.

Employment is calculated as a fixed number of positions per dollar of industry output.

GDP components are calculated based on a fixed ratio of W_i to industry output.

APPENDIX C: MIXED ENDOGENOUS-EXOGENOUS INPUT-OUTPUT IMPACTS

In a 3 industry x 3 industry input-output model with industry 3 exogenized, endogenous industry output and final demand X^M

$$\begin{pmatrix} X_1 \\ X_2 \\ Y_3^L \end{pmatrix}$$

is calculated as follows:

$$X^M = M^{-1} Y^M$$

Where $M =$

$$\begin{pmatrix} (1-a_{11}^L) & -a_{12}^L & 0 \\ -a_{21}^L & (1-a_{22}^L) & 0 \\ -a_{31}^L & -a_{32}^L & -1 \end{pmatrix}$$

$$A^L = (D(I - \mu - \alpha - \beta)B)$$

$Y^M =$

$$\begin{pmatrix} Y_1^L + a_{13}^L X_3 \\ Y_2^L + a_{23}^L X_3 \\ -(1 - a_{33}^L) X_3 \end{pmatrix}$$

$$Y^L = D((I - \mu - \alpha - \beta)e^* + (I - \mu - \beta)X_d + (I - \mu)X_r)$$

Where:

I = an identity matrix of industry by industry dimension

D = a matrix of coefficients representing commodity output proportions

B = a matrix of coefficients representing commodity input proportions (technical coefficients) by industry

μ = a diagonal matrix whose elements represent the ratio of imports to use

α = a diagonal matrix whose elements represent the ratio of government production to use

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e^* = final demand categories of consumption, government purchases of goods and services, business and government investment, and inventory additions.

X_d = final demand category of domestic exports

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