
BC Input-Output Model Report

Mountain Biking in Rossland and Golden

Executive Summary: Economic Significant of Mountain Biking in Rossland and Golden

Data collection conducted between July 1, 2011 and September 5, 2011 from mountain bike visitors to Rossland and Golden was used to gather information on their incremental spending and to produce visitor spending profiles. The information collected from the sample of mountain bike visitors who were interviewed was factored up to represent all mountain bike visitors to Rossland and Golden during the study period. Residents of both communities were not included.

Rossland:

Mountain bike visitors to Rossland were divided into three distinct groups, depending on their trail use. These groups included visitors who rode Seven Summits trail only (Seven Summits Only), Seven Summits and other trails (Seven Summits and Other), or other trails only (Other Only).

The economic impact of each group on British Columbia can be found in the following pages of this report. When combined, mountain bike visitors to Rossland spent a total of \$589,000 and their spending had the following associated impacts on the province:

- Total output (revenue) of \$362,000
- Gross Domestic Product of \$290,000 in all supplier industries
- Commodity taxes (HST, GST, fuel and other taxes) of \$122,000 paid directly (or embedded in the cost of goods purchases) by mountain bike visitors
- Taxes paid by supplier industries of \$35,000.

Please note: Relative to previous years, Seven Summits trail remained closed late into the mountain bike season due to weather conditions.

Golden:

Mountain bike visitors to Golden were divided into four distinct groups. These groups included visitors with a Kicking Horse Mountain Resort season pass (Kicking Horse Mountain Resort Season Pass Only), visitors who rode at Kicking Horse Mountain Resort only (Kicking Horse Mountain Resort Only), Kicking Horse Mountain Resort and other trails (Kicking Horse Mountain Resort and Other), or other trails only (Other Only).

The economic impact of each group on the province can also be found in the following pages of this report. When combined, mountain bike visitors to Golden spent a total of \$930,000 and their spending had the following associated impacts on the province:

- Total output (revenue) of \$656,000
- Gross Domestic Product of \$518,000 in all supplier industries
- Commodity taxes (HST, GST, fuel and other taxes) of \$161,000 paid directly (or embedded in the cost of goods purchases) by mountain bike visitors
- Taxes paid by supplier industries of \$66,000.

Framework

This report summarizes the results of an input-output analysis that assesses the economic impact of the mountain biking industry in Rossland and Golden.

The British Columbia Input-Output Model (BCIOM) was used to generate the estimates. A description of the BCIOM, and the assumptions underlying input-output analysis, is included in the Appendix.

About input-output analyses

Input-output analyses highlight the relationships among producers and consumers (businesses as well as individuals) of goods and services. An input-output analysis is based on first identifying a basket of goods and services used by a specific project¹ and then tracing through all of the steps involved in producing those goods and services to identify the total extent to which the British Columbia economy will be affected by project expenditures.

Three types of impacts

Three different types of impacts are reported in a typical input-output analysis:

The **direct impact** measures the impact on BC industries supplying goods and services directly used by the project.

The **indirect impact** measures the impact on BC industries that are further back in the supply chain. The indirect impact is cumulative, and includes transactions going all the way back to the beginning of the supply chain.

The **induced impact** measures the effect that spending by workers (those employed by the

project, or by direct and indirect supplier industries) has on the economy.

How are economic impacts measured?

Output, GDP, employment and tax revenues are the key measures used to assess the economic impacts associated with a project. In order to properly interpret the results of a BCIOM analysis, some background information about what these measures represent and how they are calculated may be helpful. A brief explanation of terms and concepts follows.

Output is simply a measure of the total value of production associated with a project. In an *industry-based* analysis, output is equal to the value of goods and services produced by the BC industry or industries that are affected by a specific project. In an *expenditure-based* analysis, it can be measured as the total dollar amount of all spending on *goods and services produced in BC*. It should be noted that purchases of goods and services produced outside the province do not directly affect BC businesses, so these expenditures are explicitly excluded from the analysis. This is usually the main reason why the direct impact on BC industries is less than initial project expenditures.

Gross Domestic Product (GDP) is a measure of the value added (the unduplicated total value of goods and services) to the BC economy by current productive activities attributable to the project. It includes **household income** (wages, salaries and benefits, as well as income earned by proprietors of unincorporated businesses) from current productive activities as well as profits and other income earned by corporations. Only activities that occur within the province are included in GDP.

Employment estimates generated by the model are derived from estimated wage costs using information on average annual wages in an industry. They are not full-time equivalent (FTE)

¹ Or, in the case of an industry analysis, the total value of production by one or more industries.

measures. Instead, they reflect the wages paid and hours spent on the job by a typical worker in an industry. For an industry where most employees work full time, the numbers will be very similar to FTE counts. However, in an industry where part-time work is more common, the job counts will be quite different from FTEs.

Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. *Provincial and federal tax revenues* include federal and provincial personal and corporation income taxes. Also included are PST, GST and other *commodity* taxes such as gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Property tax revenues are not included in the estimates. *Municipal tax revenues* are primarily related to accommodation taxes.

A more detailed explanation of input-output modelling in general and the BCIOM in particular is included in the Appendix.

Output or GDP: which measure should be used to evaluate economic impacts associated with a project?

Output and GDP are both valid economic measures. However, there are some key differences between them that should be kept in mind when analyzing the results of an input-output analysis.

Output measures correspond to total spending or production, but may overstate the economic impact of a project because the value of a good or service is counted each time it changes hands.

If one is only looking at direct effects, output is a meaningful measure since it shows the total dollar value of industry production. However, there is a danger of double-counting when activities in industries further up the supply chain are also included. Output measures may overstate the indirect economic impact associated with a particular project since the activities of every industry that has contributed in some way to the creation of a final product are

counted each time a good or service changes hands.

For example, when a construction company builds a house, the selling price of the house includes:

- the cost of the land on which it is built;
- the cost of inputs (lumber, shingles, cement, carpets, paint, hardware, plumbing fixtures, architectural services and so on) purchased and used by the builder; and
- the value of the work done by the construction company.

An **output-based impact measure** would include the entire selling price of the house (including all these imbedded costs) in the direct output of the construction industry. The value of architectural services included in the cost of the house would also be counted as an indirect output impact on the architectural services industry. The value of the lumber used would be counted as an indirect output impact on the wood industry, and going further back in the supply chain, the value of the logs used by the sawmill would be counted in the indirect output impact on the logging industry. In this example, the value of the logs used to produce the building materials is counted at least three times: once in the direct output impact, and twice in the indirect output impacts on the sawmill and logging industries. In other words, the indirect output impact could be quite high simply because goods (or services) used in production have changed hands many times.

Indirect output impacts provide useful information about the total amount of money that has changed hands as goods and services are transformed into final products. GDP is a better measure of the economic impact since the value of the work done by each industry is attributed only to the producing industry, and is counted only once.

GDP is calculated by subtracting the cost of purchased goods, services and energy from the total value of an industry's output. As a result,

the value of the work done by a producing industry is only counted once. In the construction example, the direct GDP impact would only include the value of the work done by the construction firm. The indirect impact on the sawmill industry would only include the value of the work done to transform the logs into lumber, and the indirect impact on the logging industry would be a measure of the value of the work done by the loggers. There is no double counting in GDP measures.

It should be noted that the relationship between GDP and output is a useful analytical measure

since it shows the extent to which industries rely on labour and capital as opposed to material and service inputs in production. The analysis of economic impacts relies on this relationship, since output is more easily and directly measured than GDP. In fact, the starting point for most input-output analyses is a measure of the direct output associated with a project. From this, known relationships between output and other indicators such as GDP and employment can be used to estimate the economic impact associated with a specific project.

Summary of Results, Mountain Biking in Rossland and Golden

Sources of data

The data inputs used for this study were provided to BC Stats by Destination British Columbia. This information is based on survey data collected between July 1, 2011 and September 5, 2011 and used to produce visitor

spending profiles. Model runs were performed to determine the impact in Rossland and Golden separately, by visitor location. Further details by visitor location are included in the attached data file.

Summary of Input Data, Mountain Biking									
Visitor Expenditures (\$)									
	Seven Summits Only Visitors	Seven Summits and Other Visitors	Other Only Visitors	Rosland Total	KHMR Season Pass Only Visitors	KHMR Only Visitors	KHMR and Other Visitors	Other Only Visitors	Golden Total
TRANSPORTATION									
Transportation Operation - Including gasoline and repairs for vehicle	50,249	17,122	40,463	107,834	5,827	60,516	29,261	25,671	121,275
Transportation Rentals (car/truck, insurance, etc.)	4,874	376	5,647	10,897	-	17,010	1,438	496	18,944
Local Transportation - Including local taxis, buses, subway, and parking	1,039	1,274	385	2,698	-	280	47	595	923
ACCOMMODATION									
Paid accommodation/lodging (hotel, motel, hostel, B&B, campgrounds, etc.)	40,584	29,481	37,826	107,891	10,189	119,435	53,711	25,624	208,960
FOOD & BEVERAGE									
Groceries/beverages (at grocery/liquor stores)	39,055	17,785	69,324	126,164	8,268	47,474	28,940	28,438	113,120
Food & beverage at restaurants, lounges, bars, clubs	31,743	10,767	37,108	79,619	8,417	51,525	30,650	70,271	160,864
SHOPPING									
Mountain bike repairs, rentals, equipment/related expenditures	6,786	7,557	62,689	77,032	8,855	59,364	18,953	3,607	90,780
Other shopping - Including clothing	14,384	5,241	30,222	49,847	8,144	22,263	10,757	16,005	57,169
RECREATION									
Mountain bike lift ticket	2,282	146	1,454	3,882	1,978	54,736	23,959	2,790	83,463
Other recreation/entertainment	5,436	4,540	8,695	18,670	6,057	31,403	17,873	17,855	73,189
OTHER									
All other spending	4,707	14	-	4,721	-	1,498	109	57	1,664
TOTAL	201,140	94,304	293,812	589,256	57,736	465,506	215,699	191,410	930,351

Key Assumptions

The survey information provided by Destination British Columbia was coded to BCIOM categories. In some cases there was a direct correspondence between the BCIOM categories and the survey information, and model data. However, in most instances it was necessary to allocate the survey data to BCIOM categories.

Expenditure profiles were calculated using average spending estimates derived from the survey, multiplied by the volume of visitors.

Ratios describing the allocation of the different types of accommodation used by visitors were assumed to vary regionally, and are discussed in the pertaining regional summaries. It was assumed that 40% of shopping expenditure related to mountain biking was attributable to mountain bike repairs, equipment, tools and bike parts, and the remaining 60% to rentals. In the case of all other shopping, 45% of spending

was allocated to clothing, and the remaining 55% on other goods.

The wage component of the labour cost estimate is assumed to include pre-tax wages, salaries and supplementary income (e.g., the employer's share of contributions to EI or CPP). The model's estimates of income tax revenues are calculated by estimating income taxes associated with a given wage. For the calculation of induced effects, it is assumed that 80% of workers' earnings will be used to purchase goods and services in the province (the remaining 20% goes to taxes, other payroll deductions, and savings).

It is assumed that a social safety net is in place, and that workers hired to work on the project previously had some income from EI or other safety net programs (note: the social safety net assumption only affects the estimate of worker spending, which is the induced effect associated with the project).

All of the tax revenue impacts have been calculated based on the current tax structure, which assumes an HST of 7% is applied to items subject to the tax.

Employment estimates are generated by the model based on the wage bill and average earnings in each affected industry. They should not be confused with FTE counts. The model estimates represent average jobs in an industry. In some industries, most workers are employed full time, but in others (e.g., accommodation and food services) the typical work week is usually shorter.

Interpreting the results

The direct supplier industry impacts, together with the portion of mountain biking activities that are tourist-related, are calculated in a way that is consistent with the estimates of tourism revenue, GDP and employment for the province as a whole. Therefore, it should be possible to combine these values and compare them to published measures of the size of the tourism sector.

However, revenues that originate from spending by locals using mountain biking-related services would not be part of overall tourism GDP. A measure of the total impact of services related to mountain biking indicates how much the total economy is affected by these activities. It is assumed that participants of the visitor spending survey used in this report are non-locals.

A measure of the tourist-related portion of mountain biking services, plus incremental spending by visitors indicates how much the tourism sector is affected by these activities.

Summary of Results: Mountain Biking in Rossland

Those who stayed in hotels or motels were assumed to account for 9.1% of visitors, while it was assumed the remaining 90.9% stayed in other types of accommodation (hostels, campgrounds, bed & breakfasts, etc.).

Of \$589,000 in total spending, an estimated \$45,000 was spent on imports from other countries and \$56,000 on imports from other provinces, with inventory withdrawals estimated at \$5,000. Taxes on products net of subsidies totalled approximately \$122,000.

Out of the total economic impact, the largest share of expenditure is made by consumers on services related to mountain biking activities, such as accommodation, food, and transportation, rather than by producers.

Because tourist expenditures represent final purchases of goods and services, there are no direct jobs associated with these expenditures. All of the GDP and employment generated by visitor spending originates in supplier industries, including those directly selling goods and services used by tourists, those further back in the supply chain, and those benefitting from spending by workers (the induced impact).

Direct purchases from industries that produce these goods and services are an estimated \$362,000, with another \$155,000 resulting from activities in other supplier industries.

All of the GDP associated with spending by visitors participating in mountain biking activities in Rossland is generated in supplier industries, with \$219,000 in direct supplier industries, and a further \$71,000 in impacts further back in the supply chain.

While there is no direct employment, an estimated four jobs in supplier industries are supported by these expenditures by visitors, and one job is generated in indirect supplier industries. Together with induced employment, a total of six jobs are supported by these activities.

Transportation, food and beverages represent a significant share of total spending by mountain bikers. Some types of expenditures (e.g., fuel and alcohol) include embedded taxes, such as

transportation and alcohol, as well as GST and HST paid on the final purchase price. As a result, the tax impact associated with direct expenditures is quite high. Federal, provincial, and local tax revenue impacts (including commodity and income taxes) are estimated at \$163,000 including \$122,000 in direct impacts, with another \$35,000 generated as a result of activities in supplier industries and those benefitting from spending by workers.

Among direct supplier industries, accommodation and food services suppliers benefit the most, with sales to visitors estimated at \$171,000. Other key industries include retail trade (\$49,000), finance, insurance & real estate (\$45,000), manufacturing (\$28,000), and other services excluding public administration (\$19,000).

**Economic Impact
Mountain Biking in Rossland**

Total impact, including mountain biking, supplier industry & induced effects					
	Direct	Other suppliers	Total Indirect*	Induced**	Total impact
Total expenditures, mountain biking (\$M)	0.589				
Supplier industry & induced impacts (\$M)	<i>0.362</i>	<i>0.155</i>	0.516	<i>0.064</i>	0.581
GDP at basic prices (\$M)					0.330
Mountain Biking***	0.000				0.000
Supplier industry & induced impacts	<i>0.219</i>	<i>0.071</i>	0.290	<i>0.040</i>	0.330
Employment (#)****					6
Mountain Biking	0				0
Supplier industry & induced impacts	<i>5</i>	<i>1</i>	6	<i>0</i>	6
Household income (\$M)					0.232
Mountain Biking	0.000				0.000
Supplier industry & induced impacts	<i>0.165</i>	<i>0.043</i>	0.209	<i>0.023</i>	0.232
Tax revenue (\$M)					0.163
Mountain Biking	0.122				0.122
Supplier industry & induced impacts	<i>0.024</i>	<i>0.011</i>	0.035	<i>0.005</i>	0.040

* The total indirect impact is the sum of the effect on direct suppliers and other supplier industries

** Assumes a social safety net is in place. Includes effects generated by project spending and activities of supplier industries

*** Project expenditure data provided by clients may not include all components of GDP (e.g., operating surplus)

**** Employment estimates are based on average annual wages in 2011. Includes total employment over the life of the project

Allocation of Project Expenditures Mountain Biking in Rossland	
Total mountain biking expenditures (\$M)	0.589
<i>minus leakages:</i>	
<i>imports from other countries</i>	<i>0.045</i>
<i>imports from other provinces</i>	<i>0.056</i>
<i>other leakages (e.g. withdrawals from inventory)</i>	<i>0.005</i>
<i>Equals:</i>	
Expenditures on goods & services (including labour and profits) produced in BC (\$M)	0.484
<i>Of which:</i>	
<i>Wages, benefits, unincorporated business income and operating surplus (\$M)</i>	<i>0.000</i>
<i>Taxes on products net of subsidies (\$M)</i>	<i>0.122</i>
<i>Taxes on factors of production net of subsidies (\$M)</i>	<i>0.000</i>
Direct BC supply (\$M)	0.362
<i>(the change in BC supplier industry output associated with mountain biking)</i>	
Project employment during mountain biking in rossland (#)	0
Household income included in mountain biking in rossland (\$M)	0.000
Tax revenue derived from direct project expenditures Mountain Biking in Rossland	
	Federal Provincial Local Total
Total, all sources	0.049 0.073 0.000 0.122
Taxes on products (\$M)*	0.049 0.073 0.000 0.122
Taxes on factors of production (\$M)	0.000 0.000 0.000 0.000
Personal income taxes (\$M)	0.000 0.000 0.000 0.000
Corporate income taxes (\$M)	0.000 0.000 0.000 0.000
<i>(income taxes paid on worker's wages and returns to capital reported in project expenditure)</i>	

*Small differences between this figure and the value for taxes on products net of subsidies reported in the allocation of project expenditure are due to rounding and/or the inclusion of net taxes paid on some goods purchased by subcontractors which are not reflected in the indirect & induced impacts given below.

Indirect & Induced Impacts resulting from mountain biking expenditures					
	Direct suppliers	Other suppliers	Total indirect impact (all suppliers)	Induced Impact**	Total indirect & induced impacts
Output (\$M)	0.362	0.155	0.516	0.064	0.581
GDP at basic prices* (\$M)	0.219	0.071	0.290	0.040	0.330
Employment (#)*	5	1	6	0	6
Household income (\$M)	0.165	0.043	0.209	0.023	0.232
Total tax revenue (\$M)	0.024	0.011	0.035	0.005	0.040
Federal (\$M)	0.011	0.005	0.016	0.002	0.018
<i>Personal income tax</i>	<i>0.009</i>	<i>0.003</i>	<i>0.012</i>	<i>0.001</i>	<i>0.013</i>
<i>Corporation income tax</i>	<i>0.004</i>	<i>0.002</i>	<i>0.006</i>	<i>0.001</i>	<i>0.007</i>
<i>Net taxes on products</i>	<i>-0.002</i>	<i>0.000</i>	<i>-0.002</i>	<i>0.000</i>	<i>-0.002</i>
Provincial (\$M)	0.009	0.004	0.013	0.002	0.015
<i>Personal income tax</i>	<i>0.003</i>	<i>0.001</i>	<i>0.005</i>	<i>0.000</i>	<i>0.005</i>
<i>Corporation income tax</i>	<i>0.002</i>	<i>0.001</i>	<i>0.003</i>	<i>0.000</i>	<i>0.003</i>
<i>Net taxes on products</i>	<i>0.004</i>	<i>0.002</i>	<i>0.006</i>	<i>0.001</i>	<i>0.007</i>
Local (\$M)	0.004	0.002	0.006	0.002	0.007

* Includes wages, benefits, unincorporated business income, operating surplus and net taxes on factors of production

** Assumes a social safety net is in place. Includes effects generated by project spending and activities of supplier industries

**Economic Impact
Mountain Biking, Seven Summits Only**

Total impact, including mountain biking, supplier industry & induced effects					
	Direct	Other suppliers	Total Indirect*	Induced**	Total impact
Total expenditures, mountain biking (\$M)	0.201				
Supplier industry & induced impacts (\$M)	<i>0.124</i>	<i>0.052</i>	0.176	0.022	0.198
GDP at basic prices (\$M)					0.113
Mountain Biking***	0.000				0.000
Supplier industry & induced impacts	<i>0.075</i>	<i>0.024</i>	0.099	0.014	0.113
Employment (#)****					2
Mountain Biking	0				0
Supplier industry & induced impacts	2	0	2	0	2
Household income (\$M)					0.081
Mountain Biking	0.000				0.000
Supplier industry & induced impacts	<i>0.058</i>	<i>0.014</i>	0.073	0.008	0.081
Tax revenue (\$M)					0.057
Mountain Biking	0.043				0.043
Supplier industry & induced impacts	<i>0.008</i>	<i>0.004</i>	0.012	0.002	0.014

* The total indirect impact is the sum of the effect on direct suppliers and other supplier industries

** Assumes a social safety net is in place. Includes effects generated by project spending and activities of supplier industries

*** Project expenditure data provided by clients may not include all components of GDP (e.g., operating surplus)

**** Employment estimates are based on average annual wages in 2011. Includes total employment over the life of the project

**Economic Impact
Mountain Biking, Seven Summits & Other**

Total impact, including mountain biking, supplier industry & induced effects					
	Direct	Other suppliers	Total Indirect*	Induced**	Total impact
Total expenditures, mountain biking (\$M)	0.094				
Supplier industry & induced impacts (\$M)	<i>0.063</i>	<i>0.024</i>	0.087	0.012	0.099
GDP at basic prices (\$M)					0.060
Mountain biking***	0.000				0.000
Supplier industry & induced impacts	<i>0.041</i>	<i>0.011</i>	0.052	0.007	0.060
Employment (#)****					1
Mountain biking	0				0
Supplier industry & induced impacts	1	0	1	0	1
Household income (\$M)					0.044
Mountain biking	0.000				0.000
Supplier industry & induced impacts	<i>0.032</i>	<i>0.007</i>	0.039	0.004	0.044
Tax revenue (\$M)					0.024
Mountain biking	0.018				0.018
Supplier industry & induced impacts	<i>0.004</i>	<i>0.002</i>	0.006	0.001	0.007

* The total indirect impact is the sum of the effect on direct suppliers and other supplier industries

** Assumes a social safety net is in place. Includes effects generated by project spending and activities of supplier industries

*** Project expenditure data provided by clients may not include all components of GDP (e.g., operating surplus)

**** Employment estimates are based on average annual wages in 2011. Includes total employment over the life of the project

Economic Impact Mountain Biking, Other Only

Total impact, including mountain biking, supplier industry & induced effects					
	Direct	Other suppliers	Total Indirect*	Induced**	Total impact
Total expenditures, mountain biking (\$M)	0.294				
Supplier industry & induced impacts (\$M)	<i>0.175</i>	<i>0.079</i>	0.253	0.030	0.284
GDP at basic prices (\$M)					0.157
Mountain Biking***	0.000				0.000
Supplier industry & induced impacts	<i>0.103</i>	<i>0.035</i>	0.138	0.019	0.157
Employment (#)****					3
Mountain Biking	0				0
Supplier industry & induced impacts	2	0	3	0	3
Household income (\$M)					0.107
Mountain Biking	0.000				0.000
Supplier industry & induced impacts	<i>0.075</i>	<i>0.022</i>	0.097	0.011	0.107
Tax revenue (\$M)					0.082
Mountain Biking	0.061				0.061
Supplier industry & induced impacts	<i>0.012</i>	<i>0.005</i>	0.018	0.002	0.020

* The total indirect impact is the sum of the effect on direct suppliers and other supplier industries

** Assumes a social safety net is in place. Includes effects generated by project spending and activities of supplier industries

*** Project expenditure data provided by clients may not include all components of GDP (e.g., operating surplus)

**** Employment estimates are based on average annual wages in 2011. Includes total employment over the life of the project

Summary of Results: Mountain Biking in Golden

Those who stayed in hotels or motels were assumed to account for 37.5% of visitors, while it was assumed the remaining 62.5% stayed in other types of accommodation (hostels, campgrounds, bed & breakfasts, etc.).

Of \$930,000 in total spending, an estimated \$48,000 was spent on imports from other countries and \$59,000 on imports from other provinces, with inventory withdrawals estimated at \$6,000. Taxes on products net of subsidies totalled approximately \$161,000.

Out of the total economic impact, the largest share of expenditure is made by consumers on services related to mountain biking activities, such as accommodation, food, and transportation, rather than by producers.

Because tourist expenditures represent final purchases of goods and services, there are no

direct jobs associated with these expenditures. All of the GDP and employment generated by visitor spending originates in supplier industries, including those directly selling goods and services used by tourists, those further back in the supply chain, and those benefitting from spending by workers (the induced impact).

Direct purchases from industries that produce these goods and services are an estimated \$656,000, with another \$297,000 resulting from activities in indirect supplier industries.

All of the GDP associated with spending by visitors participating in mountain biking activities in Golden is generated in supplier industries, with \$381,000 in direct supplier industries, and a further \$137,000 in impacts further back in the supply chain.

While there is no direct employment, an estimated nine jobs in supplier industries are

supported by these expenditures by visitors. Together with jobs generated in other supplier industries and induced employment, total employment is 12.

Transportation, food and beverages represent a significant share of total spending by mountain bikers. Some types of expenditures (e.g., fuel and alcohol) include embedded taxes, such as transportation and alcohol, as well as GST and HST paid on the final purchase price. As a result, the tax impact associated with direct expenditures is quite high. Federal, provincial, and local tax revenue impacts (including

commodity and income taxes) are estimated at \$237,000, including \$161,000 in direct impacts, with another \$76,000 generated as a result of activities in supplier industries and those benefitting from spending by workers.

Accommodation and food services suppliers benefit the most out of direct supplier industries, with sales to visitors of \$330,000. Other key industries include arts, entertainment & recreation (\$107,000), finance, insurance & real estate (\$60,000), retail trade (\$56,000) and manufacturing (\$21,000).

**Economic Impact
Mountain Biking in Golden**

Total impact, including mountain biking, supplier industry & induced effects					
	Direct	Other suppliers	Total Indirect*	Induced**	Total impact
Total expenditures, mountain biking (\$M)	0.930				
Supplier industry & induced impacts (\$M)	<i>0.656</i>	<i>0.297</i>	0.953	0.118	1.072
GDP at basic prices (\$M)					0.592
Mountain Biking***	0.000				0.000
Supplier industry & induced impacts	<i>0.381</i>	<i>0.137</i>	0.518	0.074	0.592
Employment (#)****					12
Mountain Biking	0				0
Supplier industry & induced impacts	9	2	11	1	12
Household income (\$M)					0.417
Mountain Biking	0.000				0.000
Supplier industry & induced impacts	<i>0.290</i>	<i>0.085</i>	0.375	0.042	0.417
Tax revenue (\$M)					0.237
Mountain Biking	0.161				0.161
Supplier industry & induced impacts	<i>0.046</i>	<i>0.020</i>	0.066	0.010	0.076

* The total indirect impact is the sum of the effect on direct suppliers and other supplier industries

** Assumes a social safety net is in place. Includes effects generated by project spending and activities of supplier industries

*** Project expenditure data provided by clients may not include all components of GDP (e.g., operating surplus)

**** Employment estimates are based on average annual wages in 2011. Includes total employment over the life of the project

Allocation of Project Expenditures Mountain Biking in Golden	
Total mountain biking expenditures (\$M)	0.930
<i>minus leakages:</i>	
<i>imports from other countries</i>	<i>0.048</i>
<i>imports from other provinces</i>	<i>0.059</i>
<i>other leakages (e.g. withdrawals from inventory)</i>	<i>0.006</i>
<i>Equals:</i>	
Expenditures on goods & services (including labour and profits) produced in BC (\$M)	0.817
<i>Of which:</i>	
<i>Wages, benefits, unincorporated business income and operating surplus (\$M)</i>	<i>0.000</i>
<i>Taxes on products net of subsidies (\$M)</i>	<i>0.161</i>
<i>Taxes on factors of production net of subsidies (\$M)</i>	<i>0.000</i>
Direct BC supply (\$M)	0.656
<i>(the change in BC supplier industry output associated with mountain biking)</i>	
Project employment during mountain biking in golden (#)	0
Household income included in mountain biking in golden (\$M)	0.000
Tax revenue derived from direct project expenditures Mountain Biking in Golden	
	Federal Provincial Local Total
Total, all sources	0.064 0.096 0.001 0.161
Taxes on products (\$M)*	0.064 0.096 0.001 0.161
Taxes on factors of production (\$M)	0.000 0.000 0.000 0.000
Personal income taxes (\$M)	0.000 0.000 0.000 0.000
Corporate income taxes (\$M)	0.000 0.000 0.000 0.000
<i>(income taxes paid on worker's wages and returns to capital reported in project expenditure)</i>	

*Small differences between this figure and the value for taxes on products net of subsidies reported in the allocation of project expenditure are due to rounding and/or the inclusion of net taxes paid on some goods purchased by subcontractors which are not reflected in the indirect & induced impacts given below.

Indirect & Induced Impacts resulting from mountain biking expenditures					
	Direct suppliers	Other suppliers	Total indirect impact (all suppliers)	Induced Impact**	Total indirect & induced impacts
Output (\$M)	0.656	0.297	0.953	0.118	1.072
GDP at basic prices* (\$M)	0.381	0.137	0.518	0.074	0.592
Employment (#)*	9	2	11	1	12
Household income (\$M)	0.290	0.085	0.375	0.042	0.417
Total tax revenue (\$M)	0.046	0.020	0.066	0.010	0.076
Federal (\$M)	0.021	0.009	0.031	0.003	0.034
<i>Personal income tax</i>	<i>0.014</i>	<i>0.006</i>	<i>0.020</i>	<i>0.002</i>	<i>0.023</i>
<i>Corporation income tax</i>	<i>0.007</i>	<i>0.003</i>	<i>0.010</i>	<i>0.001</i>	<i>0.011</i>
<i>Net taxes on products</i>	<i>0.001</i>	<i>0.000</i>	<i>0.000</i>	<i>-0.001</i>	<i>0.000</i>
Provincial (\$M)	0.017	0.007	0.024	0.004	0.028
<i>Personal income tax</i>	<i>0.005</i>	<i>0.002</i>	<i>0.008</i>	<i>0.001</i>	<i>0.009</i>
<i>Corporation income tax</i>	<i>0.003</i>	<i>0.001</i>	<i>0.005</i>	<i>0.001</i>	<i>0.005</i>
<i>Net taxes on products</i>	<i>0.009</i>	<i>0.003</i>	<i>0.012</i>	<i>0.002</i>	<i>0.014</i>
Local (\$M)	0.007	0.004	0.011	0.003	0.014

* Includes wages, benefits, unincorporated business income, operating surplus and net taxes on factors of production

** Assumes a social safety net is in place. Includes effects generated by project spending and activities of supplier industries

**Economic Impact
Mountain Biking, Season Pass Only**

Total impact, including mountain biking, supplier industry & induced effects					
	Direct	Other suppliers	Total Indirect*	Induced**	Total impact
Total expenditures, mountain biking (\$M)	0.058				
Supplier industry & induced impacts (\$M)	<i>0.038</i>	<i>0.018</i>	0.056	0.007	0.062
GDP at basic prices (\$M)					0.034
Mountain Biking***	0.000				0.000
Supplier industry & induced impacts	<i>0.022</i>	<i>0.008</i>	0.030	0.004	0.034
Employment (#)****					1
Mountain Biking	0				0
Supplier industry & induced impacts	<i>1</i>	<i>0</i>	1	0	1
Household income (\$M)					0.024
Mountain Biking	0.000				0.000
Supplier industry & induced impacts	<i>0.017</i>	<i>0.005</i>	0.022	0.002	0.024
Tax revenue (\$M)					0.015
Mountain Biking	0.010				0.010
Supplier industry & induced impacts	<i>0.003</i>	<i>0.001</i>	0.004	0.001	0.004

* The total indirect impact is the sum of the effect on direct suppliers and other supplier industries

** Assumes a social safety net is in place. Includes effects generated by project spending and activities of supplier industries

*** Project expenditure data provided by clients may not include all components of GDP (e.g., operating surplus)

**** Employment estimates are based on average annual wages in 2011. Includes total employment over the life of the project

**Economic Impact
Mountain Biking, Kicking Horse Only**

Total impact, including mountain biking, supplier industry & induced effects					
	Direct	Other suppliers	Total Indirect*	Induced**	Total impact
Total expenditures, mountain biking (\$M)	0.466				
Supplier industry & induced impacts (\$M)	<i>0.335</i>	<i>0.150</i>	0.486	0.061	0.546
GDP at basic prices (\$M)					0.307
Mountain Biking***	0.000				0.000
Supplier industry & induced impacts	<i>0.200</i>	<i>0.069</i>	0.269	0.038	0.307
Employment (#)****					6
Mountain Biking	0				0
Supplier industry & induced impacts	<i>5</i>	<i>1</i>	5	0	6
Household income (\$M)					0.213
Mountain Biking	0.000				0.000
Supplier industry & induced impacts	<i>0.148</i>	<i>0.043</i>	0.191	0.022	0.213
Tax revenue (\$M)					0.117
Mountain Biking	0.077				0.077
Supplier industry & induced impacts	<i>0.024</i>	<i>0.010</i>	0.035	0.005	0.039

* The total indirect impact is the sum of the effect on direct suppliers and other supplier industries

** Assumes a social safety net is in place. Includes effects generated by project spending and activities of supplier industries

*** Project expenditure data provided by clients may not include all components of GDP (e.g., operating surplus)

**** Employment estimates are based on average annual wages in 2011. Includes total employment over the life of the project

**Economic Impact
Mountain Biking, Kicking Horse & Other**

Total impact, including mountain biking, supplier industry & induced effects					
	Direct	Other suppliers	Total Indirect*	Induced**	Total impact
Total expenditures, mountain biking (\$M)	0.216				
Supplier industry & induced impacts (\$M)	<i>0.152</i>	<i>0.068</i>	0.220	0.028	0.248
GDP at basic prices (\$M)					0.138
Mountain Biking***	0.000				0.000
Supplier industry & induced impacts	<i>0.089</i>	<i>0.031</i>	0.121	0.017	0.138
Employment (#)****					3
Mountain Biking	0				0
Supplier industry & induced impacts	2	0	3	0	3
Household income (\$M)					0.098
Mountain Biking	0.000				0.000
Supplier industry & induced impacts	<i>0.069</i>	<i>0.020</i>	0.088	0.010	0.098
Tax revenue (\$M)					0.056
Mountain Biking	0.038				0.038
Supplier industry & induced impacts	<i>0.011</i>	<i>0.005</i>	0.015	0.002	0.018

* The total indirect impact is the sum of the effect on direct suppliers and other supplier industries

** Assumes a social safety net is in place. Includes effects generated by project spending and activities of supplier industries

*** Project expenditure data provided by clients may not include all components of GDP (e.g., operating surplus)

**** Employment estimates are based on average annual wages in 2011. Includes total employment over the life of the project

**Economic Impact
Mountain Biking, Other Only**

Total impact, including mountain biking, supplier industry & induced effects					
	Direct	Other suppliers	Total Indirect*	Induced**	Total impact
Total expenditures, mountain biking (\$M)	0.191				
Supplier industry & induced impacts (\$M)	<i>0.131</i>	<i>0.061</i>	0.192	0.023	0.215
GDP at basic prices (\$M)					0.113
Mountain Biking***	0.000				0.000
Supplier industry & induced impacts	<i>0.070</i>	<i>0.028</i>	0.099	0.014	0.113
Employment (#)****					2
Mountain Biking	0				0
Supplier industry & induced impacts	2	0	2	0	2
Household income (\$M)					0.081
Mountain Biking	0.000				0.000
Supplier industry & induced impacts	<i>0.056</i>	<i>0.017</i>	0.073	0.008	0.081
Tax revenue (\$M)					0.050
Mountain Biking	0.036				0.036
Supplier industry & induced impacts	<i>0.008</i>	<i>0.004</i>	0.012	0.002	0.014

* The total indirect impact is the sum of the effect on direct suppliers and other supplier industries

** Assumes a social safety net is in place. Includes effects generated by project spending and activities of supplier industries

*** Project expenditure data provided by clients may not include all components of GDP (e.g., operating surplus)

**** Employment estimates are based on average annual wages in 2011. Includes total employment over the life of the project

Interpreting the BCIOM results

BCIOM model results are summarized in the tables attached to this report. This section defines some of the terms and concepts used in the report tables and explains how they are calculated.

Variables that are calculated directly from information supplied by clients

Total project expenditure is usually provided by the client, and includes all direct expenditures associated with the project.

There are no jobs, GDP or output associated with the production of goods and services that are imported into the province. Therefore an estimate of the value of imported goods and services is deducted from project direct spending to determine the value of **project expenditure in BC**.

Estimates of wages, salaries and other components of GDP provided by the client are reported in **project direct GDP at basic prices**.

About Project Direct GDP Estimates

It should be noted that project direct GDP figures are derived from information provided by clients. These figures are usually project-specific, but they are not always based on complete information. For example, it is often possible to get good data on wages and salaries associated with a project or activity. Labour costs are the biggest component of GDP, but other variables which ought to be included in the estimate (such as investment income, operating surplus, or depreciation) are not always known. When the GDP figures generated by the BCIOM are based on partial information, they may understate the project's direct contribution to GDP.

Project direct employment is derived based on the project's wage bill and estimates of average annual wages in the industry.

Household income is calculated based on project direct wages, benefits and mixed income.

Variables that are estimated using model information

Commodity taxes less subsidies is calculated using information on average sales and other tax rates associated with each good or service purchased by the project.

Project expenditure in BC is traced back to the producing industries in order to determine the **direct BC supply**. Because industries do not "produce" taxes, wages or other components of GDP, the direct BC supply only includes the value of goods and services produced by BC industries. Direct project spending on wages, salaries, operating surplus and taxes are excluded from this measure.

An estimate of **corporate and personal income taxes** associated with these project direct expenditures is calculated using information on average tax rates from the model.

BCIOM impact estimates

The model is shocked using the direct BC supply calculated from the information provided by the client. This is used to determine the total economic impact of the project on the BC economy, which is reported in terms of direct, indirect and induced impacts.

The **direct impact** measures the change in economic activity required to satisfy the initial change in demand. The **direct output impact** is equal to the direct BC supply—the change in the economic activity of the industries producing the goods and services purchased by the project.

The **direct GDP impact** is the GDP generated as a result of the activities of the industries that produce the goods and services used by the project.

The **direct employment impact** shows total employment in these industries, and the **direct household income impact** is a measure of the wages, salaries, benefits and other income earned by these workers.

The *direct tax revenue impact* includes personal, corporation, sales and other taxes generated as a result of the activities of the industries that supply the goods and services used by the project.

The allocation of tax revenues to federal, provincial and local governments is based on model averages.

Induced effects

The induced effect, which measures the impact associated with expenditures by workers, includes purchases of a variety of goods and services, including housing.

More detailed information about the impacts is available in the report tables included in this document.

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Appendix

Some background on input-output models and analysis

Input-output analysis is based on statistical information about the flow of goods and services among various sectors of the economy. This information, presented in the form of tables, provides a comprehensive and detailed representation of the economy for a given year. An input-output model is essentially a database showing the relationship between commodity usage and industry output. It consists of three components:

- a table showing which commodities—both goods and services—are consumed by each industry in the process of production (the input matrix)
- a table showing which commodities are produced by each industry (the output matrix)
- a table showing which commodities are available for consumption by final users (the final demand matrix).

These data are combined into a single model of the economy which can be solved to determine how much additional production is generated by a change in the demand for one or more commodities or by a change in the output of an industry. Changing the usage or production of a commodity or group of commodities is often referred to as shocking the model. The known relationship between goods and services in the economy is used to generate an estimate of the economic impact of such a change.

If a change in demand is met by increasing or decreasing imports from other jurisdictions, there is no net effect on domestic production. All of the benefits or costs associated with employment generation or loss, and other economic effects, will occur outside the region.

Therefore, it is important to identify whether or not a change in the demand for a good or service is met inside or outside a region.

Assumptions and Caveats

From an IO perspective, commodities made in BC have a much bigger impact than those imported into the province. The analysis presented here is based on using default import ratios for most commodities: i.e., assuming they are purchased locally, but allowing for the fact that they may have been manufactured elsewhere.

All tax data were generated using the model structure, and are based on averages for an industry or commodity.

The precision of the figures in the tables should not be taken as an indication of their accuracy. Economic modelling is an imprecise science and the estimates in this report are probably no better than +/- 10%.

The British Columbia Input-Output Model

The BCIOM can be viewed as a snapshot of the BC economy. It is derived from inter-provincial input-output tables developed by Statistics Canada and includes details on 727 commodities, 300 industries, 170 “final demand” categories, and a set of computer algorithms to do the calculations required for the solution of the model. It can be used to predict how an increase or a decrease in demand for the products of one industry will have an impact on other industries and therefore on the entire economy.

Limitations and caveats associated with input-output analysis

Input-output analysis is based on various assumptions about the economy and the inter-

relationships between industries. These assumptions are listed below:

Input-output models are linear. They assume that a given change in the demand for a commodity or for the outputs of a given industry will translate into a proportional change in production.

Input-output models do not take into account the amount of time required for changes to happen. Economic adjustments resulting from a change in demand are assumed to happen immediately.

It is assumed that there are no capacity constraints and that an increase in the demand for labour will result in an increase in employment (rather than simply re-deploying workers).

It is assumed that consumers spend an average of 80% of their personal income on goods and services. The remaining 20% of personal income is consumed by taxes, or goes into savings.

The BCIOM is based on a “snapshot” of the BC economy in 2008. It is assumed that relationships between industries are relatively stable over time, so that the 2008 structure of the economy continues to be applicable today. However, it should be noted that employment estimates have been adjusted to reflect wage levels for the year of the expenditures in each case.

The BCIOM does not distinguish between regional effects. It will not, for example, differentiate between the economic impact of a plant located in one region of the province and a similar plant elsewhere in BC.