Mountain Biking Economic Impact Study - Pemberton

May 2017

Summary: Mountain Biking in Pemberton 2016

Mountain biking is a small, but important outdoor activity in Pemberton, with 3,462 riders taking over 32,000 rides in 2016. Of note, close to 3,000 riders and 6,300 rides were made by visitors from outside of the region (Pemberton, Whistler, and Squamish), providing a boost to the local economy.

The spending of out-of-town visitors to Pemberton who rode on the mountain bike trail system in 2016 totaled $908,000, supporting $1.4 million in economic activity in British Columbia including $1.1 million of economic activity in Pemberton. These expenditures supported $403,000 in wages and salaries in the province through the support of 8.4 jobs, of which 6.5 jobs and $276,000 in wages and salaries were supported in Pemberton. The total net economic activity (GDP) generated by visitors to the Pemberton trail system in 2016 was $765,000 for Canada as a whole; $627,000 for British Columbia and $389,000 for Pemberton.

Visitors to the Pemberton trail system also supported tax revenues totaling $243,000 when considering Canada as a whole. Visitors supported federal government tax revenues of $118,000 with an additional $94,000 in taxes accruing to the Province of British Columbia. Moreover, $17,100 in municipal taxes were supported in the province, of which $12,600 was in Pemberton.

Mountain Biking in Pemberton 2016 by the Numbers

2,974 out-of-town riders	**$858,000** in visitor spending directly attributable to mountain biking in Pemberton	**6.5** Pemberton jobs supported by mountain bike tourism and operational spending	**50%** of out-of-town riders stayed overnight in Pemberton
6,939 rides in Pemberton by out-of-town visitors	**$276,000** of wages and salaries supported in Pemberton	**$627,000** boost to provincial GDP	**$94,000** in taxes supported in British Columbia

Background

The Mountain Bike Tourism Association (MBTA), in partnership with the Canadian Sport Tourism Alliance (CSTA) surveyed mountain bikers to gather data to prepare an economic impact study of mountain biking in the Sea to Sky Corridor, including the communities of North Vancouver, Squamish, and Pemberton. The CSTA, working with Tourism Whistler and Whistler / Blackcomb, prepared studies of the Whistler trail system, the Whistler Bike Park and Crankworx in 2015.

Together, these studies provide an update to the 2006 economic impact of mountain biking in the Sea to Sky Corridor (the results for the entire Corridor are found in a separate report). Since 2006, mountain biking has experienced pronounced growth in the region. The 2016 research clearly demonstrates that the Sea to Sky Corridor is now a world-class mountain biking destination, attracting regional, national and international mountain bikers who travel to the region specifically for riding.
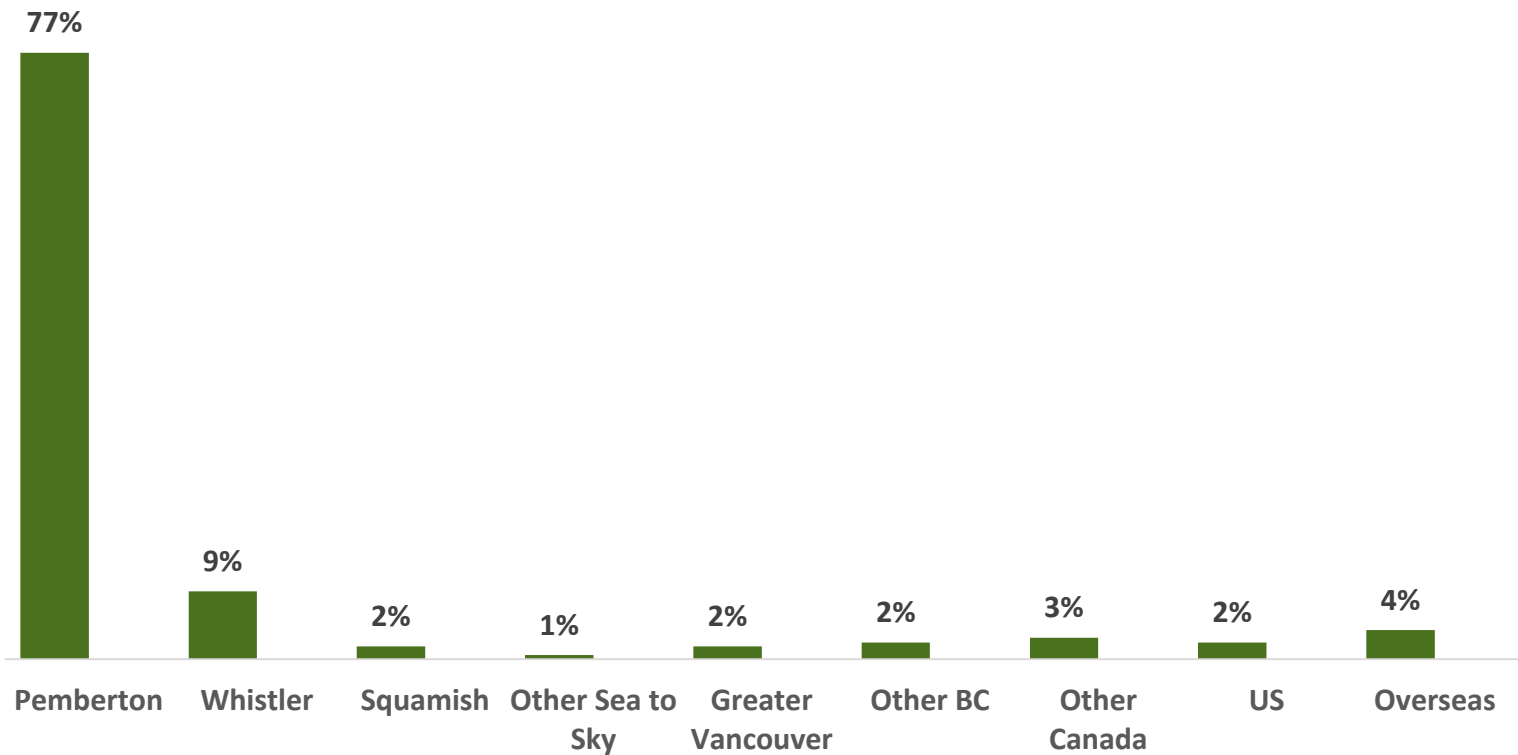
This document reports the findings from surveys conducted in Pemberton. Note, data was not collected in Pemberton in 2006, so no tracking data is available.

Survey data was collected via in-person intercepts at 3 primary locations in Pemberton: Happy Trail entrance, One Mile Lake, and Mackenzie FSR (dropped part way through due to lack of volume) from July 8 to August 29, 2016. Interviewing shifts were staggered and covered morning, mid-day, and early evening throughout the summer on both weekdays and weekends. A total of 210 surveys were conducted.

Respondent Origin

- The largest trail user group is Pemberton residents, who make up roughly three-quarters of riders. A further 11% of riders reside in Whistler and Squamish. Collectively, this group is referred to as Local for the remainder of the report.

- Roughly one-in-ten riders reside outside the Sea to Sky Corridor. They are referred to as Visitor for the remainder of the report.

Pemberton	Whistler	Squamish	Other Sea to Sky	Greater Vancouver	Other BC	Other Canada	US	Overseas
77%	9%	2%	1%	2%	2%	3%	2%	4%

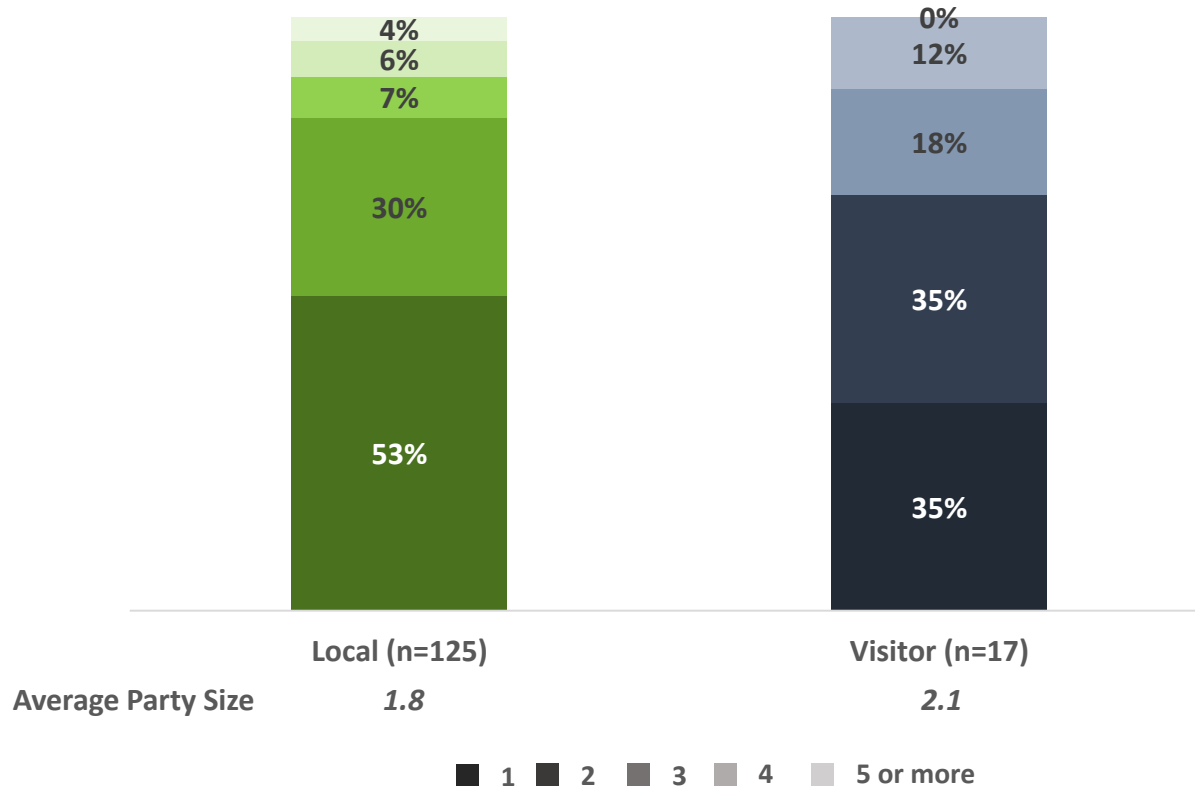Where is your primary place of residence?

Non-BC Visitor Origin

- As noted on the previous slide, very few riders using Pemberton trails originate from outside BC. The table below shows actual counts of non-BC residents. Of the 16 non-BC residents, Alberta is the most prevalent (4 respondents) followed by Germany (3 respondents).

Origin	(n=16)
Alberta	4
Québec	1
Colorado	1
New Mexico	1
Utah	1
Wyoming	1
Germany	3
Australia	2
New Zealand	2

What state are you from?
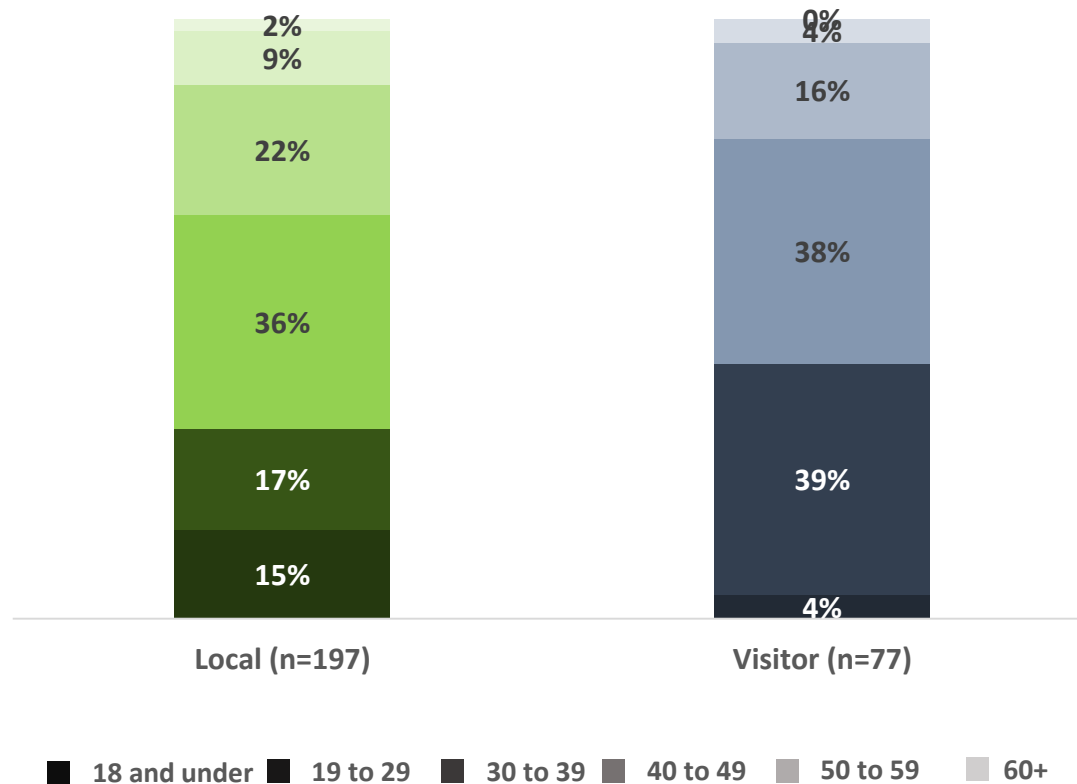What country are you from?

Riding Party Size

- Respondents were asked several questions about those they were riding with (referred to as Riding Party).

- Riding party sizes were similar for out-of-town visitors and locals, with locals somewhat more likely to ride on their own, which resulted in a slightly smaller average party size (1.8 riders vs. 2.1 among visitors).

	Local (n=125)	Visitor (n=17)
5 or more	4%	0%
4	6%	12%
3	7%	18%
2	30%	35%
1	53%	35%
Average Party Size	*1.8*	*2.1*

Legend: ■ 1 ■ 2 ■ 3 ■ 4 ■ 5 or more

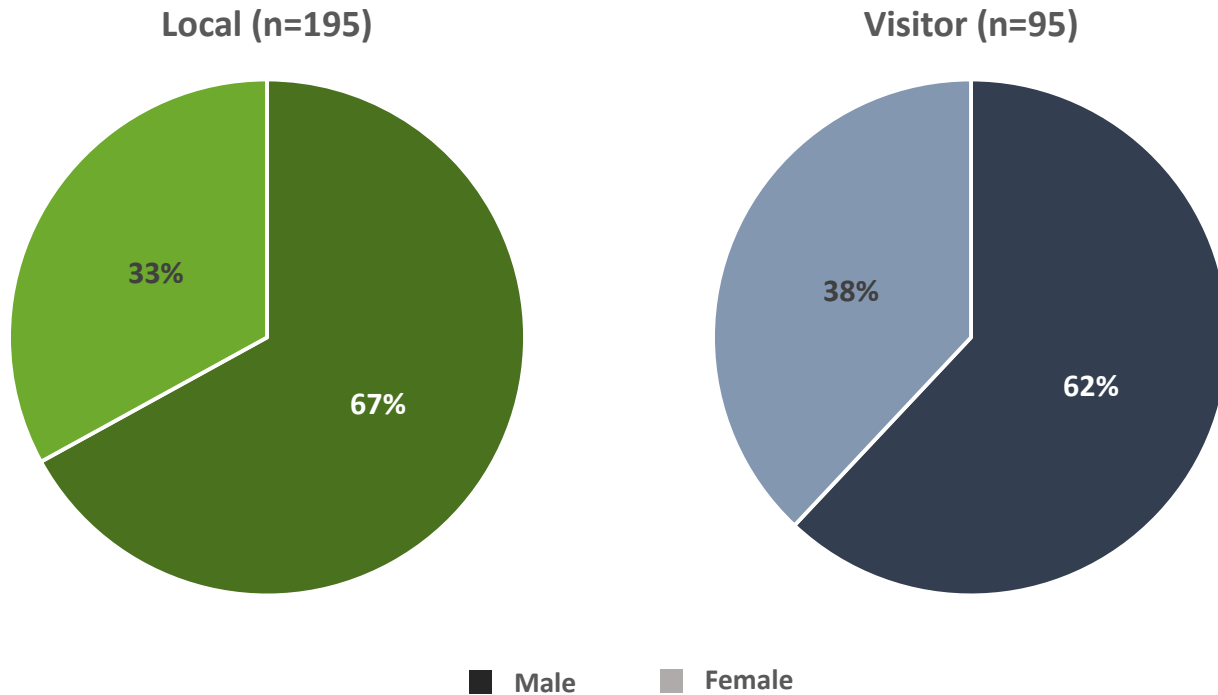Excluding yourself, how many people are you riding with today?

Riding Party Ages

- Survey respondents were asked to provide the ages of all members of the riding party. The most common age groups for locals was 30 to 39 years while visitors were slightly more likely into the 19-29 cohort.

- Local riding parties were slightly older than out-of-town riders, with the second most common age group being 40-49 years, while for visiting riders, it was 30-39 years.

Local (n=197)

2%
9%
22%
36%
17%
15%

Visitor (n=77)

0%
4%
16%
38%
39%
4%

Legend: 18 and under · 19 to 29 · 30 to 39 · 40 to 49 · 50 to 59 · 60+

In your group, how many people are aged: (including the respondent)
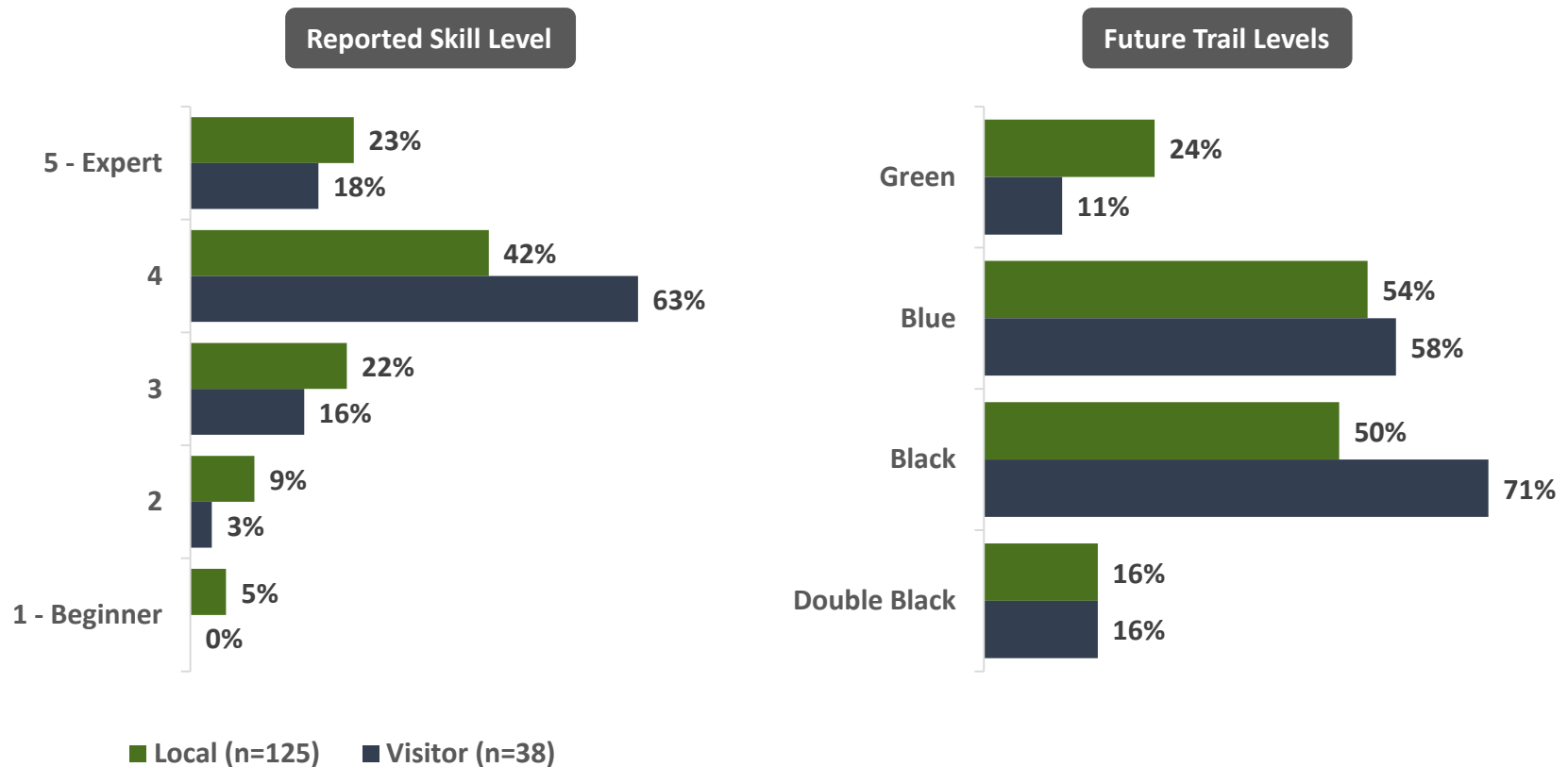
Riding Party Gender

- The survey found that on average, there were two male riders for every female rider. Out-of-town riders were slightly more likely to be female than local riders (38% vs. 33%)

Local (n=195)

Visitor (n=95)

33%

67%

38%

62%

■ Male   ■ Female

Gender distribution of party: (including the respondent)

Skill Level

- Riders were asked about the skill level of the riding group with local respondents more likely to assess their ability lower than visitors (65% of locals provided a 4 or 5 rating, while 81% of visitors provided the same response).

- When riders were asked about the level of difficulty for future Pemberton trails, out-of-town riders chose black most often while locals chose blue (note riders were allowed to make 2 selections).

Reported Skill Level

	Local	Visitor
5 - Expert	23%	18%
4	42%	63%
3	22%	16%
2	9%	3%
1 - Beginner	5%	0%

Future Trail Levels

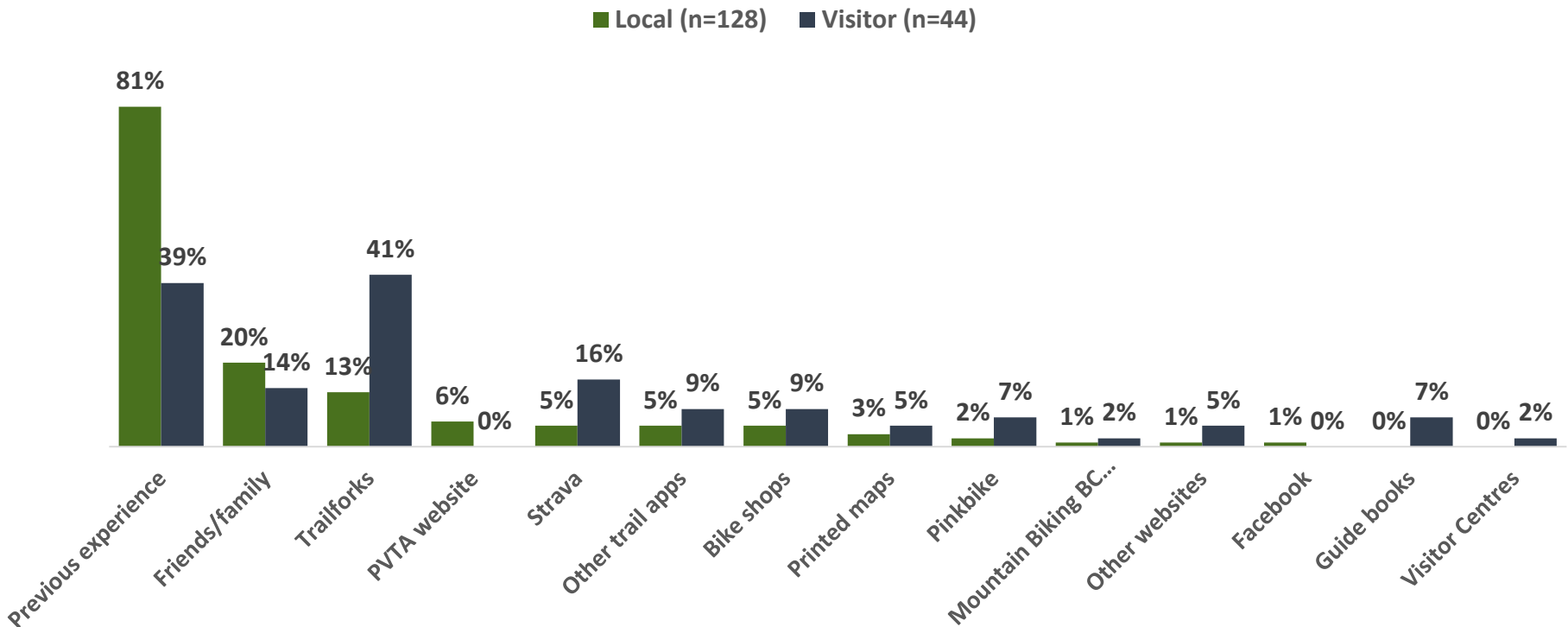|	Local	Visitor
Green	24%	11%
Blue	54%	58%
Black	50%	71%
Double Black	16%	16%

■ Local (n=125)   ■ Visitor (n=38)

On a scale of 1 to 5 with 1 meaning beginner and 5 meaning expert, how would you rate the skill level of your group?

What level of difficulty should future trails be? (Select up to two)
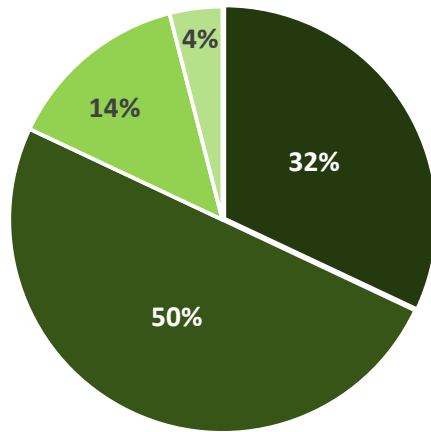
Information Sources

- For local residents, previous experience was the most common source of information for riding in Pemberton (81%) as was the case for more than one-third of out-of-town riders.

- Trailforks was cited as an information source by 41% of out-of-town riders.

■ **Local (n=128)**   ■ **Visitor (n=44)**

Source	Local	Visitor
Previous experience	81%	39%
Friends/family	20%	14%
Trailforks	13%	41%
PVTA website	6%	0%
Strava	5%	16%
Other trail apps	5%	9%
Bike shops	5%	9%
Printed maps	3%	5%
Pinkbike	2%	7%
Mountain Biking BC...	1%	2%
Other websites	1%	5%
Facebook	1%	0%
Guide books	0%	7%
Visitor Centres	0%	2%

Which of the following information sources did you use to plan your ride today? (Select all that apply)

Overnight Stays and Accommodation Type

- Visitors were asked about overnight stays. Roughly one-third of riders were on a day trip. Note sample sizes of overnight visitors is small (n=28), so results must be interpreted with caution.

- Overall, 68% of out-of-town riders stayed overnight as part of their trip. Half of these stayed in Pemberton, followed by Whistler (14% of overnight visitors). Camping and staying with friends or relatives were the most common accommodation choices in Pemberton.

Accommodation Use (n=28)

Pemberton (n=19)

- 32%
- 50%
- 14%
- 4%

- ■ Day trip
- ■ Overnight - Pemberton
- ■ Overnight - Whistler
- ■ Overnight - Other Sea to Sky

Staying with friends or relatives	Camping	Hotel / Motel	B&B	Second Home	Timeshare (Whistler)
37%	37%	16%	11%	5%	5%
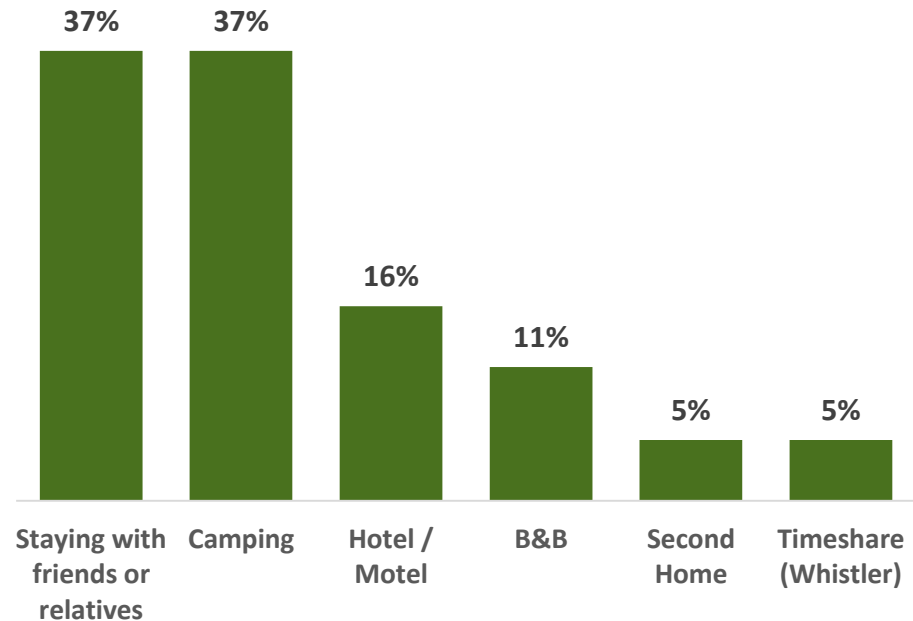
Where are you staying overnight?   What kind of accommodation are you using on this trip?   11
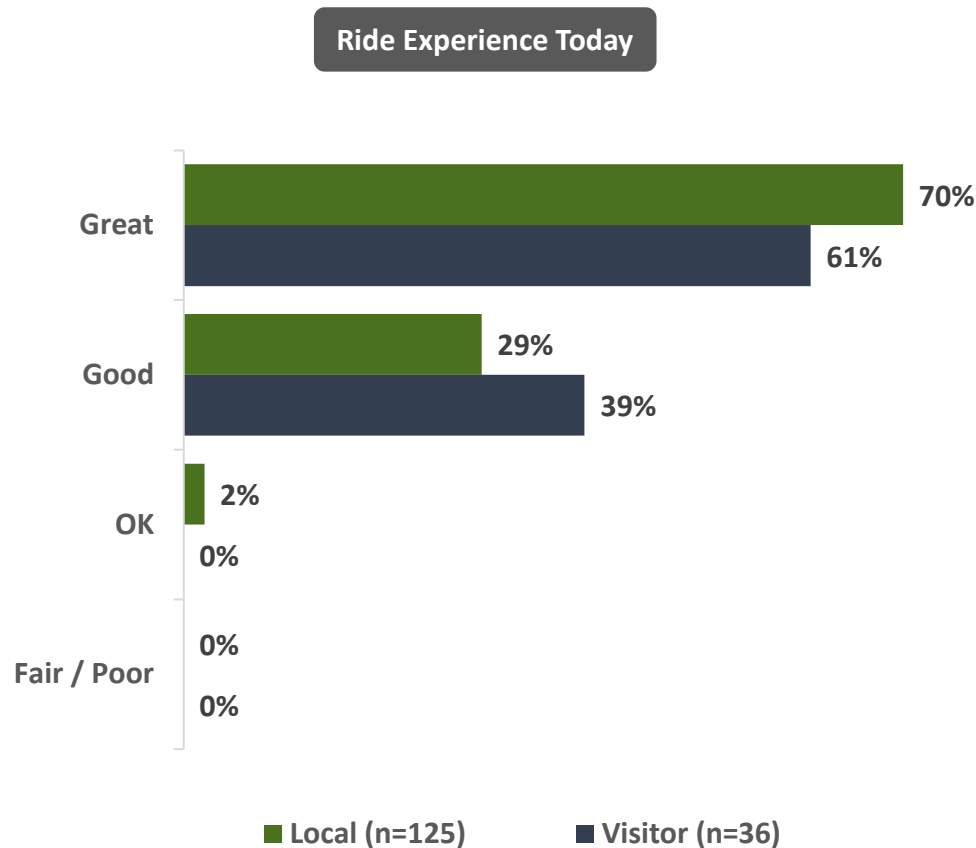
Length of Stay in Pemberton

- Respondents who stayed in Pemberton were asked if they spent all of their time in Pemberton or if they visited other parts of BC on their trip. Note, once again sample sizes are small, so should be interpreted with caution.

- Slightly more than half (56%) visited another location in BC in addition to Pemberton.

- Among visitors who only stayed in Pemberton, the average length of stay was 8.0 nights. Riders who stayed in Pemberton as part of a longer trip spent 3.9 nights in Pemberton and 14.4 nights elsewhere.

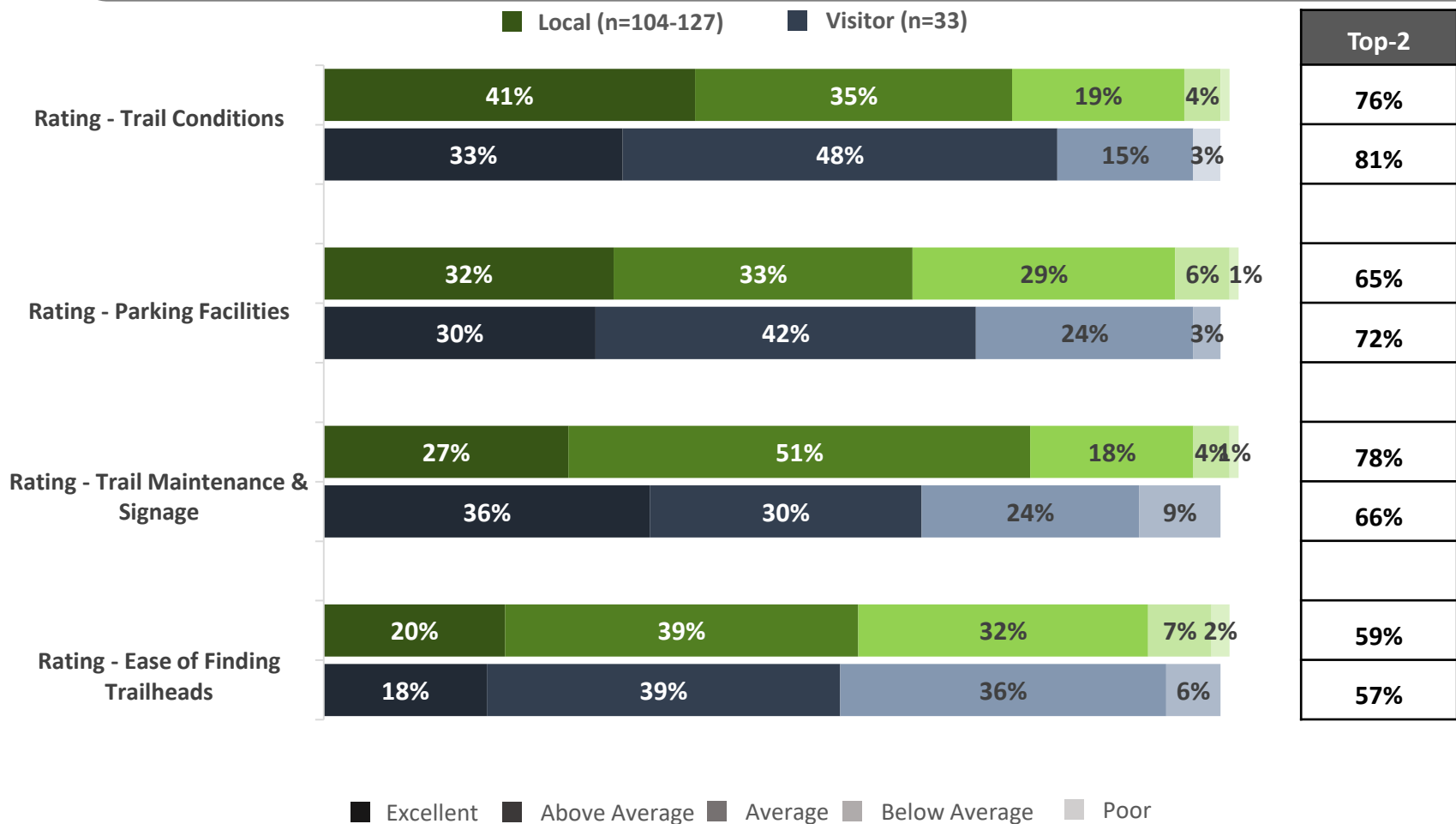| Length of Stay in Pemberton (n=28)	Share (%)
All nights in Pemberton	44%
Pemberton Nights	8.0
Some nights in Pemberton	56%
Pemberton Nights	3.9
Nights elsewhere	14.4

Overall Riding Experience

- More than six-in-ten respondents rated their overall riding experience as great, with locals more likely to provide this assessment.

Ride Experience Today

	Local (n=125)	Visitor (n=36)
Great	70%	61%
Good	29%	39%
OK	2%	0%
Fair / Poor	0%	0%

■ Local (n=125)   ■ Visitor (n=36)

How would you rate your ride experience today?
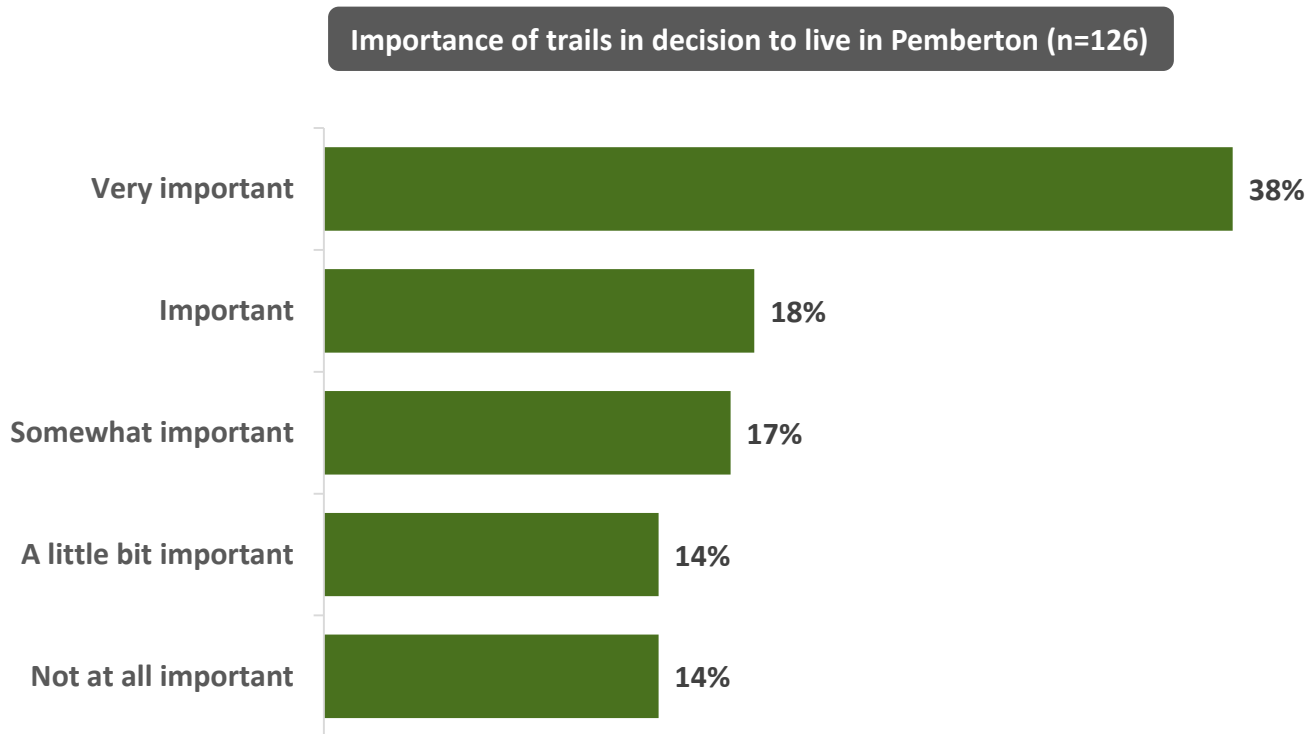
Satisfaction with Aspects of the Ride

- Respondents were asked about specific aspects of their Pemberton riding experience.

- Locals voiced the highest satisfaction with trail maintenance and signage followed by ease of finding trailheads. They were less satisfied with parking facilities and trail conditions compared to visitors.

- Visitors were satisfied with trail conditions and parking, but less so with trail maintenance and ease of finding trailheads.

Legend: ■ Local (n=104-127) ■ Visitor (n=33)

Rating	Excellent	Above Average	Average	Below Average	Poor	Top-2
Rating - Trail Conditions (Local)	41%	35%	19%	4%		76%
Rating - Trail Conditions (Visitor)	33%	48%	15%	3%		81%
Rating - Parking Facilities (Local)	32%	33%	29%	6%	1%	65%
Rating - Parking Facilities (Visitor)	30%	42%	24%	3%		72%
Rating - Trail Maintenance & Signage (Local)	27%	51%	18%	4%	1%	78%
Rating - Trail Maintenance & Signage (Visitor)	36%	30%	24%	9%		66%
Rating - Ease of Finding Trailheads (Local)	20%	39%	32%	7%	2%	59%
Rating - Ease of Finding Trailheads (Visitor)	18%	39%	36%	6%		57%

Legend: ■ Excellent ■ Above Average ■ Average ■ Below Average ■ Poor

On a scale of 1 to 5 with 1 meaning poor and 5 meaning excellent, please rate the following:
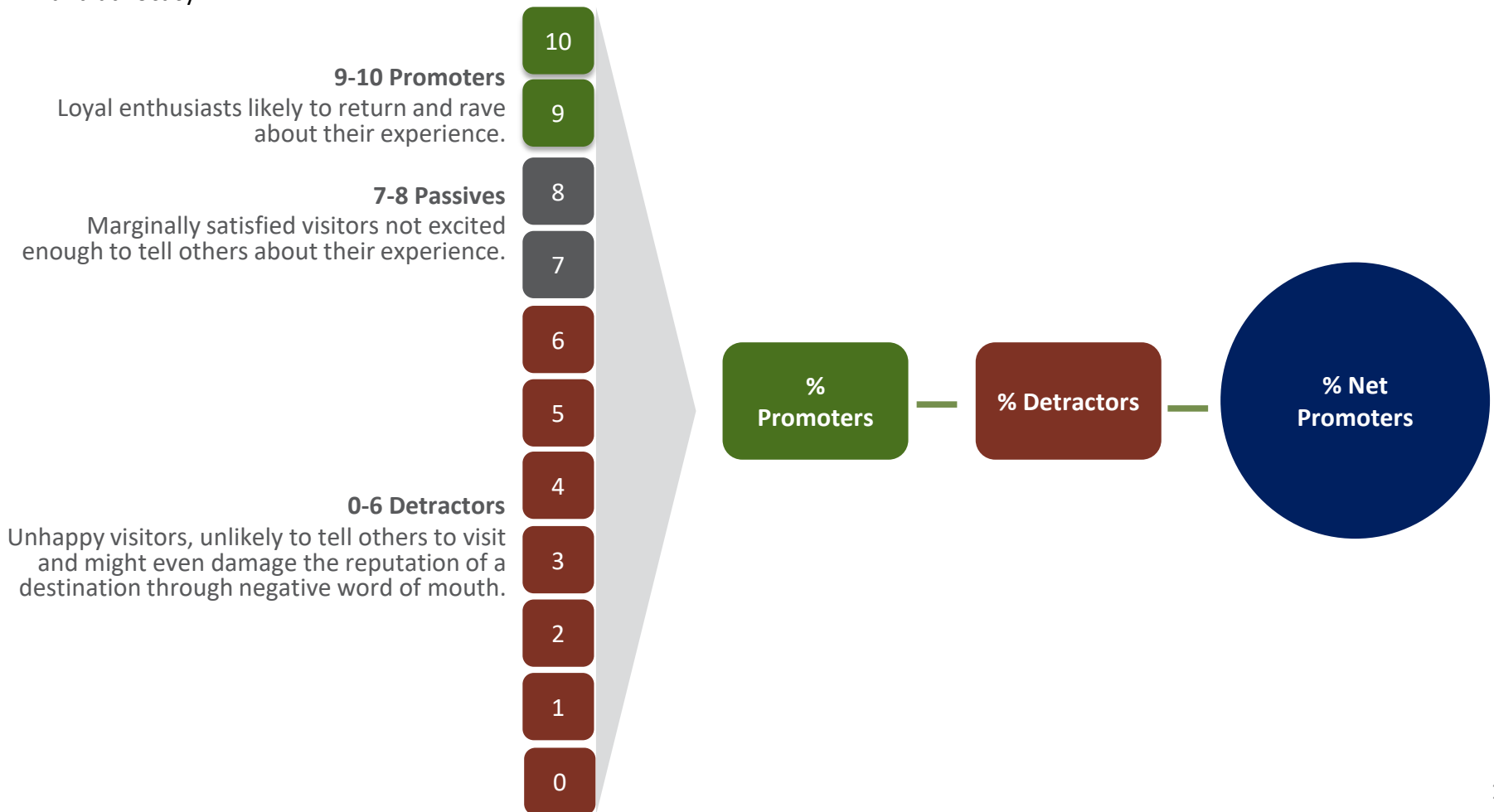
Importance of Trails to Locals

- Local riders were asked about the importance of the trail system in their decision to live in Pemberton.

- While four-in-ten said the trail system was very important and a further 18% said it was an important factor, the trail system was less of a factor for choosing to live in Pemberton as compared to Squamish (where 82% said very important or important).

Importance of trails in decision to live in Pemberton (n=126)

Very important	38%
Important	18%
Somewhat important	17%
A little bit important	14%
Not at all important	14%

How important are/were the trails in your decision to live in Pemberton?
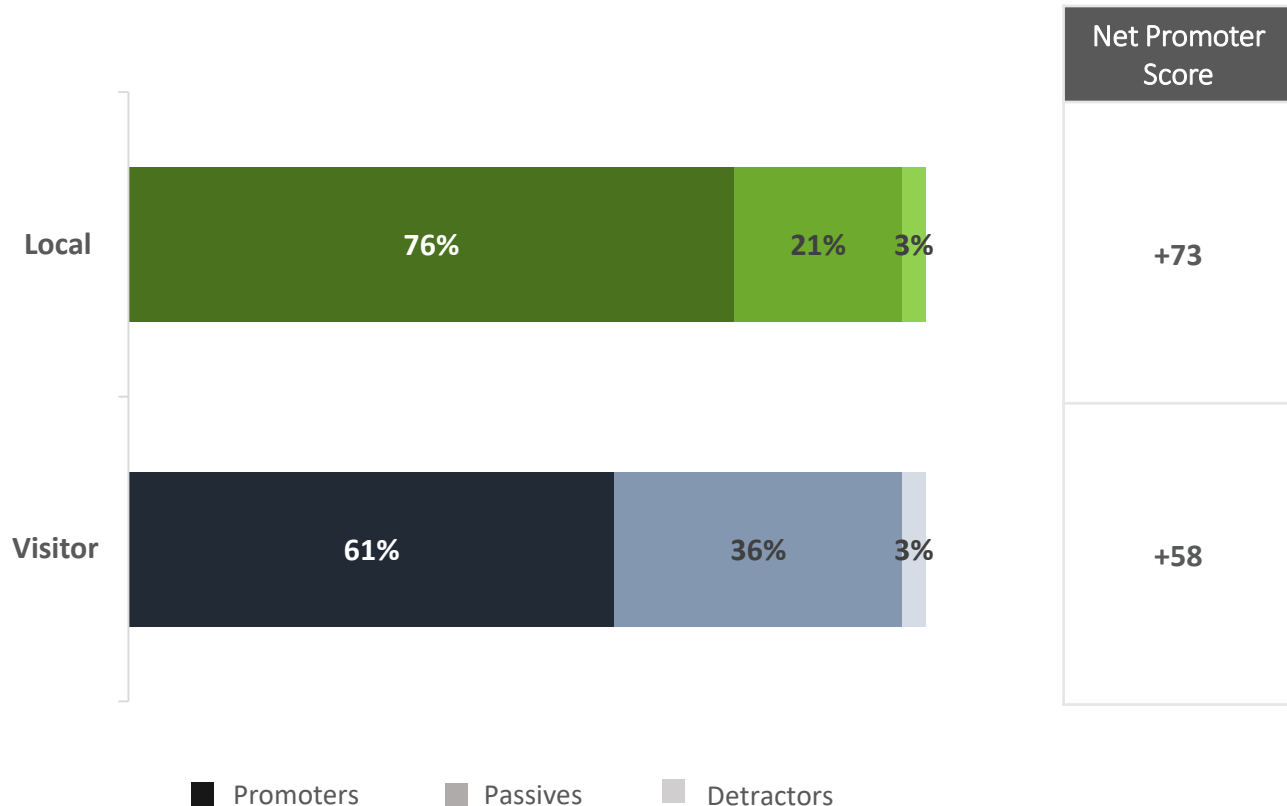
Net Promoter Score

The Net Promoter Score (NPS) is a metric that helps organizations monitor the engagement of their customers. It reflects the likelihood that someone will recommend a product/company/place to friends, family or colleagues. In the context of the tourism industry, NPS is based on responses to the question, "How likely are you to recommend [destination] as a travel destination to a friend, family member or colleague?"

The intention to recommend a travel destination, reported by the NPS, is a proxy measure of overall satisfaction with the travel experience. Satisfaction with the travel experience and the intention to recommend greatly increase the likelihood of a return visit and advocacy.

9-10 Promoters
Loyal enthusiasts likely to return and rave about their experience.

7-8 Passives
Marginally satisfied visitors not excited enough to tell others about their experience.

0-6 Detractors
Unhappy visitors, unlikely to tell others to visit and might even damage the reputation of a destination through negative word of mouth.

10
9
8
7
6
5
4
3
2
1
0

%
Promoters
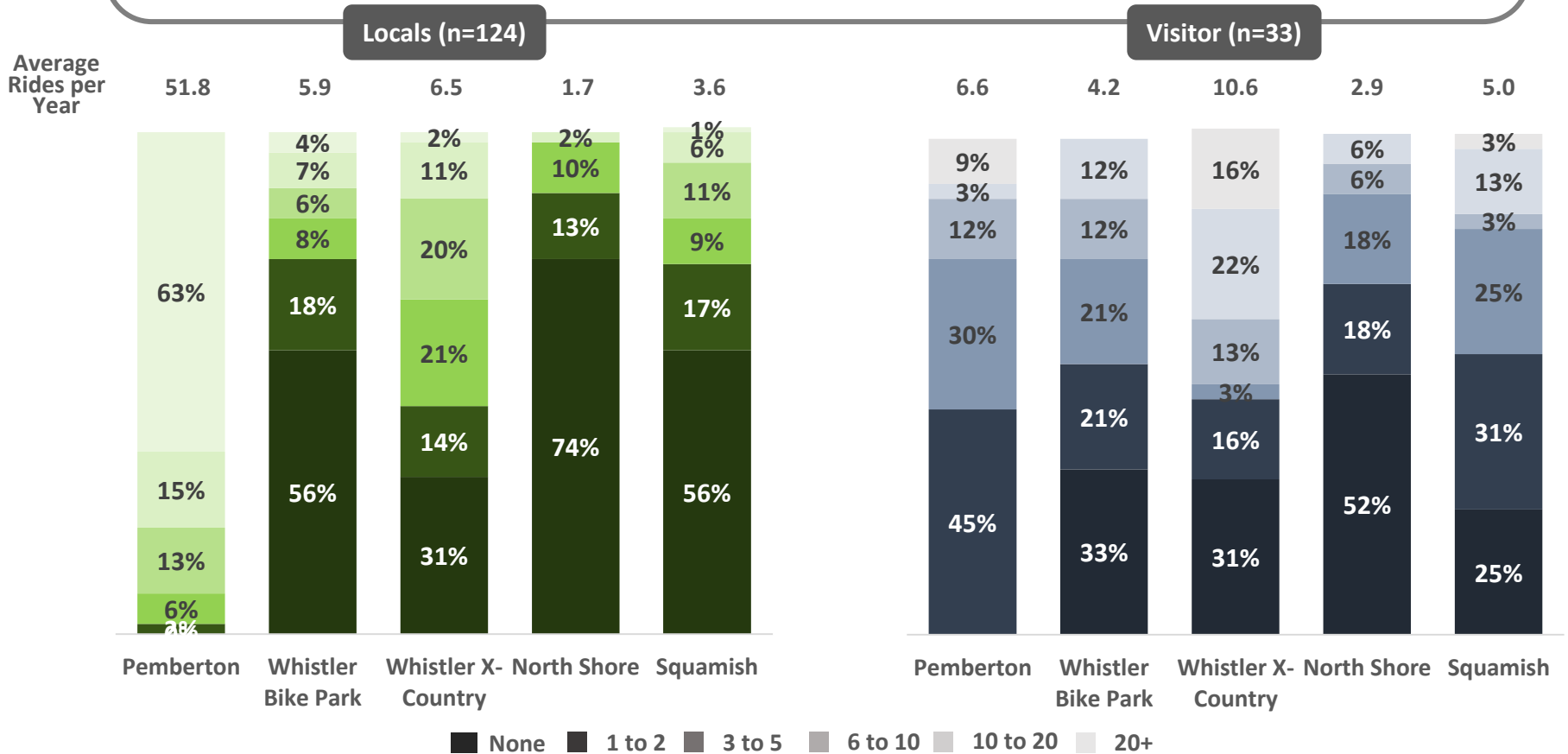
—

% Detractors

—

% Net Promoters

Net Promoter Score Results

- Riders were asked how likely they were to recommend Pemberton as a riding destination using a scale of 0 meaning extremely unlikely and 10 meaning extremely likely.

- A Net Promoter Score (NPS) was calculated by subtracting the number of Detractors (rating 0-6) from the Promoters (rating 9-10).

- The Net Promoter Score for local riders was +73, falling to +58 for out-of-town riders, meaning there is considerable potential for locals to be advocates for the Pemberton trail system, while there is slightly less potential among visitors.

	Net Promoter Score
Local	+73
Visitor	+58

Local: 76% | 21% | 3%

Visitor: 61% | 36% | 3%

■ Promoters   ■ Passives   ■ Detractors

How likely are you to recommend Pemberton as a mountain biking destination to a friend, family member or colleague?

Sea to Sky Rides per Year

- Riders were asked about the number of times they rode in Pemberton and other destinations in the Sea to Sky Corridor in the past year.

- Locals report an average of 52 rides per year in Pemberton. Not surprisingly, Local riders were frequent visitors to the Whistler Bike Park and trails.

- Visitors reported the heaviest use of Whistler cross country trails (10.6 rides on average) followed by Pemberton trails (6.6 rides).

Locals (n=124)

Visitor (n=33)

Average Rides per Year

Locals	Pemberton	Whistler Bike Park	Whistler X-Country	North Shore	Squamish
	51.8	5.9	6.5	1.7	3.6

Visitor	Pemberton	Whistler Bike Park	Whistler X-Country	North Shore	Squamish
	6.6	4.2	10.6	2.9	5.0

Locals percentages:

Pemberton: 63%, 15%, 13%, 6%
Whistler Bike Park: 4%, 7%, 6%, 8%, 18%, 56%
Whistler X-Country: 2%, 11%, 20%, 21%, 14%, 31%
North Shore: 2%, 10%, 13%, 74%
Squamish: 1%, 6%, 11%, 9%, 17%, 56%

Visitor percentages:

Pemberton: 9%, 3%, 12%, 30%, 45%
Whistler Bike Park: 12%, 12%, 21%, 21%, 33%
Whistler X-Country: 16%, 22%, 13%, 3%, 16%, 31%
North Shore: 6%, 6%, 18%, 18%, 52%
Squamish: 3%, 13%, 3%, 25%, 31%, 25%

Legend: ■ None ■ 1 to 2 ■ 3 to 5 ■ 6 to 10 ■ 10 to 20 ■ 20+

Over the last 12 months, how many days did you ride in the following locations:

Rider Volume Calculations

- A key calculation in the economic impact assessment is determining the number of rides that took place in Pemberton and have been prepared using the survey results along with some statistics from Trailforks. As noted previously, surveys took place at the Happy Trail Entrance, on the Mackenzie Fire Service Road and at the entrance to One Mile Lake. Based on Trailforks data for Pemberton, each survey station represents 13.0%, 13.5% and 8.7% of rider check-ins in Pemberton, or a combined average of 11.4% when weighted by the number of shifts completed at each location. Including the respondents, surveyors recorded an average of 19.55 riders passing by their station per shift they worked. With this survey locations representing 11.4% of Pemberton riders, this implies a total of 170 riders on the trails in Pemberton during the typical shift. Accounting for the time of day that the shifts took place (using Trailforks time of day records to adjust) suggests an average of 256 riders per day during July and August, or 7,791 per month. According to Trailforks records, July and August represent 23.9% of rides taking place in Pemberton, thus there were an estimated total of 32,218 rides in 2016

- The number of individual local riders and tourism visits made to Pemberton was calculated by calculating the total number of rides attributable to each group. This value was then divided by the number of rides per person for local residents or number of rides per visit for visitors. The results show that there were approximately 488 local riders in 2016, 2,148 day trips made to Pemberton and 826 overnight visits.

Measure	Value
Survey location / Pemberton rides	11%
Riders counted per shift	19.55
Rides per survey shift	171
Rides per Day	256
Rides per Month	7,691
2016 Rides	**32,218**

	Survey Incidence	Rides by Origin	Rides per Season / Visit	Riders / Visits
Pemberton Residents	78%	25,279	51.8	488
Same day	7%	2,148	1.0	2,148
Overnight	15%	4,791	5.8	826
Total	**100%**	**32,218**	**9.3**	**3,462**

Visitor Spending – Per Person/Aggregate

- Non-resident riders were asked how much they spent in Pemberton on this visit (locals were not asked about expenditures as their spending does not represent new money in the community). The average spend among all visitors is $325, with restaurants ($97) and groceries ($73) accounting for the majority of spending.

- The low accommodation spending reflects the extensive use of camping and staying friends and relatives.

- Multiplying the spending results by the number of visits made shows that visitors spent $965,000 in Pemberton while on a trip which included mountain biking.

	Sameday	Overnight	Average
Accommodation	$0.00	$142.55	$39.59
Restaurants	$42.50	$237.69	$96.71
Groceries / Other Food & Beverage	$10.00	$238.53	$73.47
Recreation & Entertainment	$2.50	$65.63	$20.03
Bike Shop	$12.00	$55.57	$24.10
Shopping	$0.00	$56.23	$15.62
Transport	$33.00	$112.35	$55.04
Total	**$100.00**	**$908.55**	**$324.57**

	Sameday	Overnight	Total
Visits	*2,148*	*826*	*2,974*
Accommodation - Trip	$0	$117,745	$117,745
Restaurants	$91,290	$196,332	$287,622
Groceries / Other Food & Beverage	$21,480	$197,027	$218,507
Recreation & Entertainment	$5,370	$54,206	$59,576
Bike Shop	$25,776	$45,905	$71,681
Shopping	$0	$46,447	$46,447
Transport	$70,884	$92,800	$163,684
Total	**$214,800**	**$750,461**	**$965,261**

Please include the best estimate of spending for all members of your party for the entire trip to Pemberton.

Visitor Spending – scaled by importance

- The final step was to divide by the importance of the Pemberton trail system in the riders decision to visit Pemberton using a scale of 1 (not at all important) to 10 (very important).

- The relative importance of the trail system was then used to develop the total spending directly attributable to the Pemberton trails, which reached $858,000 in 2016.

	Sameday	Overnight	Total
Importance (1-10)	*9.6*	*8.7*	*8.9*
Accommodation - Trip	$0	$102,291	$102,291
Restaurants	$87,378	$170,563	$257,941
Groceries / Other Food & Beverage	$20,559	$171,167	$191,727
Recreation & Entertainment	$5,140	$47,092	$52,232
Bike Shop	$24,671	$39,880	$64,551
Shopping	$0	$40,350	$40,350
Transport	$67,846	$80,620	$148,466
Total	**$205,594**	**$651,963**	**$857,557**

On a scale of 1-10, how important was mountain biking in your decision to travel to Pemberton?

Operational Spending

- The Pemberton Valley Trails Association (PVTA) conducts most of the cycling trail maintenance in Pemberton, with an annual budget of approximately $10,000. In addition, PVTA, along with other partners, fund trail construction averaging $40,000 per year over the past 2 years.

Economic Impact Results

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	Pemberton	British Columbia	Canada
Initial Expenditure	$907,558	$907,558	$907,558
GDP	$389,691	$627,454	$764,766
Wages & Salaries	$275,510	$403,549	$477,765
Employment	6.5	8.4	9.4
Industry Output	$1,118,700	$1,396,279	$1,694,148
Total Taxes	$164,571	$213,852	$243,345
Federal	$81,481	$102,757	$117,897
Provincial	$70,451	$93,951	$102,726
Municipal	$12,638	$17,143	$22,722

[4] Jobs reported in this study refer to the number of jobs, vs. full time equivalent (i.e.: two people working half time in a job that typically features half time employment would represent two jobs or one FTE). Additionally, the direct employment effects are generally extra shifts or overtime for existing workers rather than new employment.

Economic Impact Results – detailed

		Pemberton		British Columbia		Canada
Initial Expenditure		$907,558		$907,558		$907,558
Gross Domestic Product						
Direct Impact		$244,248		$318,629		$318,629
Indirect Impact		$85,773		$160,106		$238,495
Induced Impact		$59,670		$148,718		$207,642
Total Impact		$389,691		$627,454		$764,766
Industry Output						
Direct & Indirect		$1,027,660		$1,169,378		$1,353,311
Induced Impact		$91,040		$226,901		$340,837
Total Impact		$1,118,700		$1,396,279		$1,694,148
Wages & Salaries						
Direct Impact		$194,075		$237,029		$237,029
Indirect Impact		$56,075		$103,859		$147,551
Induced Impact		$25,360		$62,661		$93,185
Total Impact		$275,510		$403,549		$477,765
Employment (Full-year jobs)						
Direct Impact		5.0		5.7		5.6
Indirect Impact		0.9		1.7		2.4
Induced Impact		0.6		1.0		1.5
Total Impact		6.5		8.4		9.4
Taxes (Total)						
Federal		$81,481		$102,757		$117,897
Provincial		$70,451		$93,951		$102,726
Municipal		$12,638		$17,143		$22,722
Total		$164,571		$213,852		$243,345

How Economic Impact Modelling Works

Visitor Expenditure ($858,000)

Operational / Capital Expenditures ($50,000)

Expenditure

Economic Multipliers

Economic Impact

GDP

Jobs

Taxes

Wages & Salaries

steam pro 2.0
real data • real time
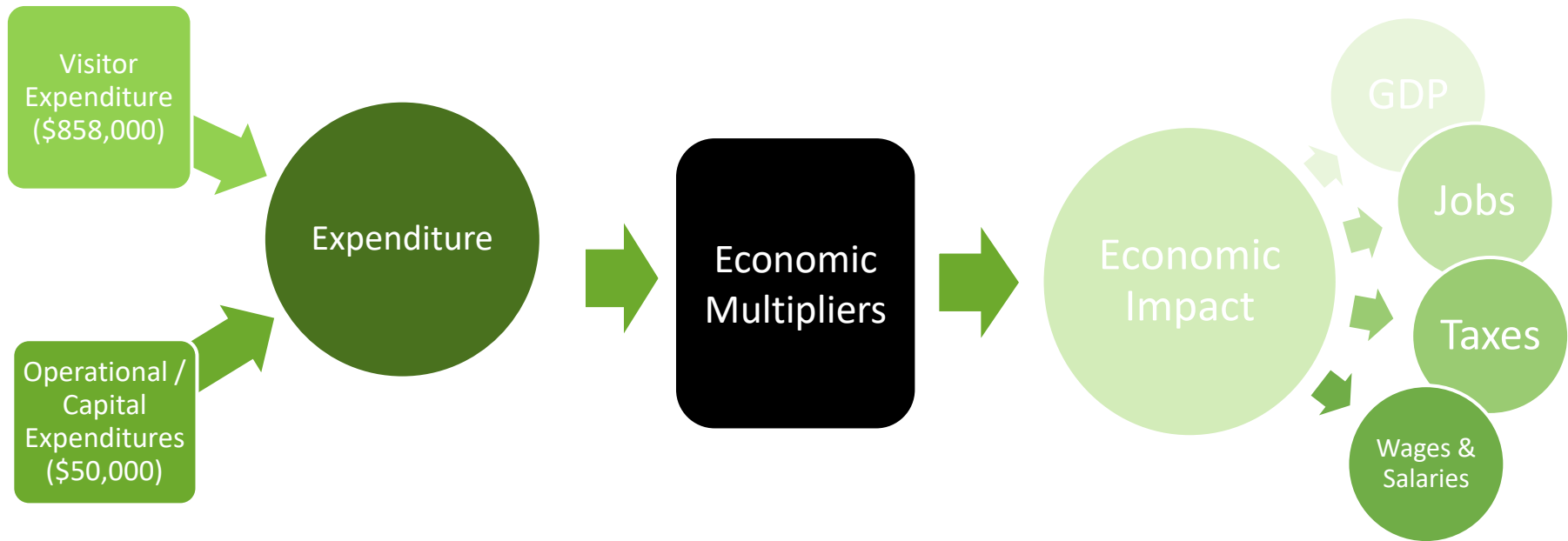
Expendityres

- Represents the combined spending of:
  - Visitors (Tourism)
  - Operations
  - Capital Construction
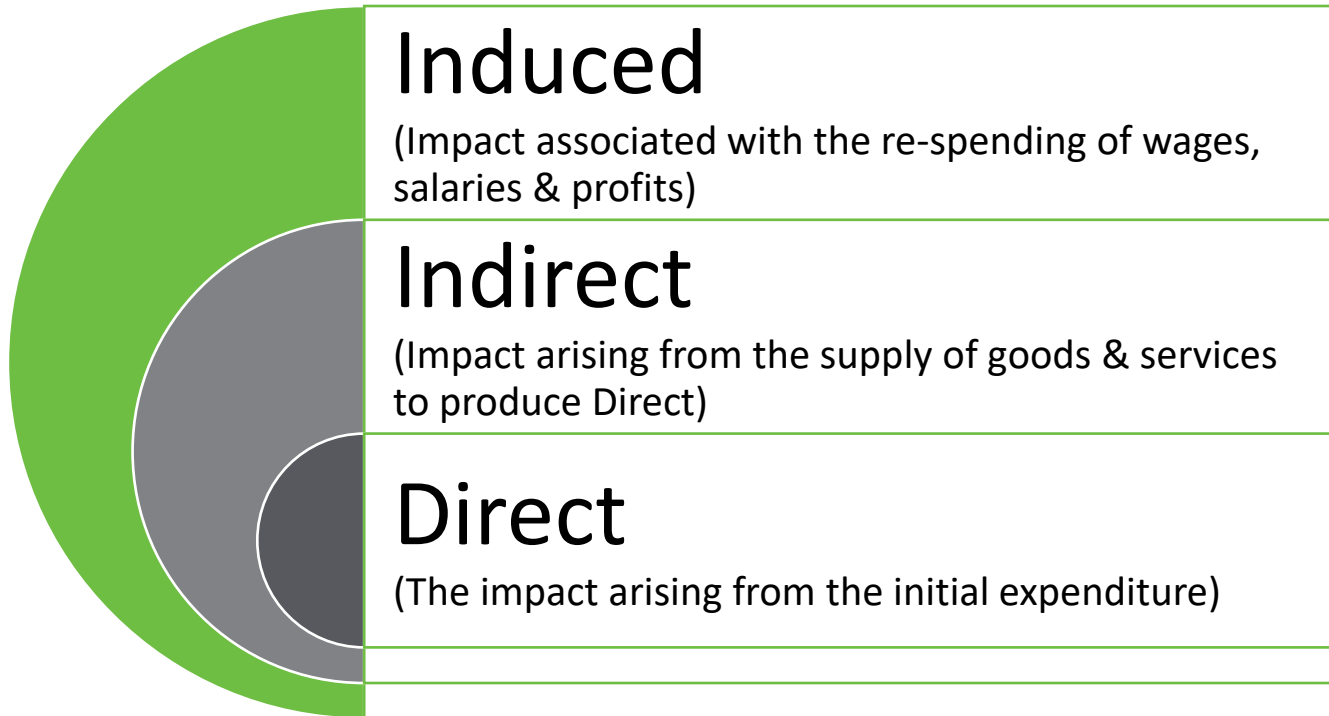- Is the amount of money being spent in the community **BEFORE** the application of any economic multipliers

Gross Domestic Product (GDP)

- Represents the total value of production of goods and services in the economy resulting from the initial expenditure under analysis

- This is a **NET** measure and represents the value of goods and services produced less the cost of inputs used. It also accounts for the value of any imports to the region under consideration

- The concept is well understood by most government stakeholders and economists

Economic Activity

This figure represent the direct, indirect and induced impacts on industry output generated by the initial tourism expenditure. It should be noted that the industry output measure represents the **sum** total of all economic activity that has taken place and consequently involve double counting on the part of the intermediate production phase.

Since the Gross Domestic Product (GDP) figure includes only the **net** total of all economic activity (i.e. considers only the value added), the industry output measure will always exceed or at least equal the value of GDP.

Economics Background

Induced
(Impact associated with the re-spending of wages, salaries & profits)

Indirect
(Impact arising from the supply of goods & services to produce Direct)

Direct
(The impact arising from the initial expenditure)

steam pro 2.0
real data ▪ real time

Appendix 1: Economic Impact Methodology STEAM$^{2.0}$

Background

Briefly, the purpose of STEAM 2.0 is to calculate both the provincial and regional economic impacts of sport and event-based tourism. The economic impacts are calculated on the basis of capital and operating expenditures on goods, services and employee salaries, and on the basis of tourist spending within a designated tourism sector. The elements used to measure the economic impacts are Gross Domestic Product (GDP), Employment, Taxes, Industry Output and Imports. STEAM measures the direct, indirect & induced effects for each of these elements.

In order to produce economic contribution assessments that are robust and reliable, we developed specific economic contribution models at the national, provincial and metropolitan levels that make use of the most current and most detailed input-output tables and multipliers available from Statistics Canada. The approach also leverages the credibility and robustness of sector specific tax data available from Statistics Canada's Government Revenues Attributable to Tourism (GRAT) report.

Technical Description of the Impact Methodology Used by STEAM$^{2.0}$

While the economic contribution analysis will be conducted primarily at the provincial level, developing highly disaggregated provincial economic models required first the construction of a highly disaggregated national economic contribution model. The reason for this was that detailed input-output tables from Statistics Canada are only publicly available at the national level.

For STEAM 2.0 and STEAM PRO 2.0, we pioneered a solution that leveraged the detail available on an industry basis from the national model using aggregate multipliers that are available for each province and territory.

While the set of multipliers that Statistics Canada produces do not provide insights into the economic contributions attributed to specific industries operating within the economy, they do represent a known aggregate level which the overall economy can be expected to benefit by. The key to our approach is the linkage between the industry level detail (provided by the model developed from the input-output tables) with the benchmarks provided by the various multipliers.

Appendix 1: Economic Impact Methodology STEAM$^{2.0}$

STEAM 2.0 and many other impact studies are based on input-output techniques. Input-output models involve the use of coefficients that are based on economic or business linkages. These linkages trace how tourist expenditures or business operations filter through the economy. In turn, the coefficients applied are then used to quantify how tourism-related activity in a particular region generates employment, taxes, income, etc. The input-output approach indicates not only the direct and indirect impact of tourism, but can also indicate the induced effect resulting from the re-spending of wages and salaries generated.

All impacts generated by the model are given at the direct impact stage (i.e. the "front line" businesses impacted by tourism expenditures), indirect impact stage (i.e. those industries which supply commodities and/or services to the "front line" businesses) and the induced impact stage (induced consumption attributable to the wages and salaries generated from both the direct and indirect impact).

The direct and indirect impact phase results are benchmarked with the corresponding direct and indirect multipliers from Statistics Canada at the national level, on an industry by industry basis.

We developed induced round effects that replicate the re-spending behavior of consumers (who benefited through wages either directly or indirectly by sport events) along income ranges. The re-spending profiles used account for different average wages that exist in specific industry sectors. Ultimately, the re-spending profiles permit the determination of distinct levels and composition of induced consumption depending upon the extent to which those industries are directly and indirectly affected by economic activity arising from hosting sports events and festivals.

After the level and composition of induced consumption is determined, the process involved treating the induced consumption spending in a separate analysis—much the same as the original sport event related expenditures were. Hence, these expenditures were simulated through the direct and indirect impact phase and treated as if they were initial expenditures.

Once again, the magnitude of the results of the induced impact phase was benchmarked against the corresponding multipliers supplied by Statistics Canada. Again, this is done to ensure that, in aggregate, the estimates align with those from Statistics Canada but at the same time the analysis also provides an industry by industry breakdown.

Taxes and employment are two key impact measures that require data sources beyond those available in the input-output model.

Appendix 1: Economic Impact Methodology STEAM$^{2.0}$

Taxes

Despite the fact that many of the sales tax ratios are available from the margins tables produced by Statistics Canada, additional work was required to adjust these rates based on possible changes in tax rates between 2010 (the year of the input-output tables) and 2012 (the year of the analysis). To extend the analysis to include the full range of taxes and fees impacted by sport events, we relied on statistics reported in Statistics Canada's Government Revenues Attributable to Tourism (GRAT) report. This report is particularly useful because it follows the concepts and definitions as identified in the Canadian Tourism Satellite Account (CTSA). As well, the scope of taxes covered by the GRAT is more comprehensive than what would be possible using only the input-output tables. In particular, the GRAT includes taxes on incomes (i.e., on employment earnings, corporate profits, net income of unincorporated business and government business enterprises), contributions to social insurance plans (i.e., premiums for Canada/Quebec Pension Plan, Employment Insurance and workers compensation), taxes on production and products (such as sales and property taxes), and from sales of government goods and services.

Aside from reporting on the tax collections directly attributable to tourism, the GRAT study also identifies the composition and level of taxes attributed to various industry segments of the economy. At the present time, the most recent GRAT report relates to the 2011 calendar year. The established rates calculated from GRAT were adjusted, where applicable, to reflect rate changes that occurred between 2011 and subsequent years.

To incorporate the findings from the GRAT study into our analysis, we estimated ratios that were based on the most current industry sector tax data along with the most current GDP estimates on an industry basis. The resulting tax coefficients were then used to determine tax calculations that would be based on GDP estimates stemming from the model on an industry by industry basis.

The categories of taxes that were benchmarked against the GRAT statistics include corporate taxes, contributions to social insurance plans and other taxes on production. Other taxes on production comprise property taxes, payroll taxes, capital taxes, permits and many other miscellaneous taxes covering federal, provincial and municipal levels of government. The contributions to social insurance plans include employment insurance, worker's compensation and the Canada and Quebec pension plans.

We also went outside of the figures reported in the GRAT report to assemble income tax coefficients. This was done to capture the detail that was already available from the input-output analysis and to better align with the granular demand associated with sporting event expenditures. The source used to assemble specific income tax rates, by income range, was the Canadian Tax Foundation's most recent Finances of the Nation report. This report provide insights on taxes on incomes (i.e., on employment earnings, corporate profits, net income of unincorporated business and government business enterprises) and contributions to social insurance plans (i.e., premiums for Canada/Quebec Pension Plan, Employment Insurance and workers compensation).

Appendix 1: Economic Impact Methodology STEAM[2.0]

Employment

Employment is a measure that is available, in aggregate form, from the multiplier tables produced by Statistics Canada. However, the employment multipliers relate to the year of the tables (2010) and not the year of the current analysis. To adjust for this difference, indices of average wage growth by industry were incorporated to reflect the period between 2010 and the year under analysis. Annual data from Statistics Canada's Labour Force survey were used on an industry basis to capture the change in average earnings.

Once again, in order to preserve the industry by industry detail available from the model, appropriate average wages were applied against industry labour income estimates to align with the employment multipliers from Statistics Canada. The one distinction being that the employment multipliers reflect the economy operating in 2010. Hence, adjustments on average wages were made to estimate what the employment multipliers would resemble had they been produced for subsequent years.

Regional (Sub-Provincial) Impact Methodology

The method used to simulate intraprovincial commodity flows and ultimately regional impacts follows directly from regional economic principles. The principle is referred to as the "gravity model". Basically the "gravity model" states that the required commodity (& service) inputs will be "recruited" in a manner that takes into consideration economies of scale (i.e. production costs), transportation costs and the availability of specific industries. Economies of scale (i.e. lower production costs) are positively correlated with input demand while greater transportation costs are negatively correlated with input demand. Fulfilling that demand from other provincial regions is contingent on the fact that the specific industry does actually exist. An advantage of using the "gravity model" to simulate intraprovincial commodity flows is that as the industrial composition of the labour force changes, or as new industries appear for the first time in specific regions, the share of production between the various sub-provincial regions also changes.

By following this principle of the gravity model, all sub-provincial regions of a province are assigned a coefficient for their relative economies of scale in each industry (using the latest industry labour force measures) as well as a coefficient to represent the transportation cost involved to get each industry's output to the designated market. One variation on the "gravity model" principle involves the estimation of "relative trade distances" by incorporating different "weights" for different modes of transport. Once these coefficients are generated for all regions and over all industries, a measure of sensitivity (mostly relative to price, but in the case of service industries also to a "local preference criteria") is then applied to all commodities. Another variation on the strict "gravity model" approach is that the measure of sensitivity is adjusted by varying the distance exponent (which in the basic "gravity model" is 2) based on the commodity or service required. The variation in distance exponents revolve, principally, around two research hypotheses: (1) the greater the proportion of total shipments from the largest producer (or shipper), the lower the exponent, and (2) the greater the proportion of total flow which is local (intraregional), the higher the exponent.

Appendix 2: Glossary of Terms Used by STEAM$^{2.0}$

Initial Expenditure - This figure indicates the amount of initial expenditures or revenue used in the analysis. This heading indicates not only the total magnitude of the spending but also the region in which it was spent (thus establishing the "impact" region).

Direct Impact - Relates ONLY to the impact on "front-line" businesses. These are businesses that initially receive the operating revenue or tourist expenditures for the project under analysis. From a business perspective, this impact is limited only to that particular business or group of businesses involved. From a tourist spending perspective, this can include all businesses such as hotels, restaurants, retail stores, transportation carriers, attraction facilities and so forth.

Indirect Impact - Refers to the impacts resulting from all intermediate rounds of production in the supply of goods and services to industry sectors identified in the direct impact phase. An example of this would be the supply and production of bed sheets to a hotel.

Induced Impact - These impacts are generated as a result of spending by employees (in the form of consumer spending) and businesses (in the form of investment) that benefited either directly or indirectly from the initial expenditures under analysis. An example of induced consumer spending would be the impacts generated by hotel employees on typical consumer items such as groceries, shoes, cameras, etc. An example of induced business investment would be the impacts generated by the spending of retained earnings, attributable to the expenditures under analysis, on machinery and equipment.

Gross Domestic Product (GDP) - This figure represents the total value of production of goods and services in the economy resulting from the initial expenditure under analysis (valued at market prices).

- **NOTE:** The multiplier of Total/Initial, represents the total (direct, indirect and induced) impact on GDP for every dollar of direct GDP. This is a measure of the level of spin-off activity generated as a result of a particular project. For instance if this multiplier is 1.5 then this implies that for every dollar of GDP directly generated by "front-line" tourism businesses an additional $0.50 of GDP is generated in spin-off activity (e.g. suppliers).

- The multiplier of total/$ Expenditure, represent the total (direct, indirect and induced) impact on GDP for every dollar of expenditure (or revenue from a business perspective). This is a measure of how effective project related expenditures translate into GDP for the province (or region). Depending upon the level of expenditures, this multiplier ultimately determines the overall level of net economic activity associated with the project. To take an example, if this multiplier is 1.0, this means that for every dollar of expenditure, one dollar of total GDP is generated. The magnitude of this multiplier is influenced by the level of withdrawals, or imports, necessary to sustain both production and final demand requirements. The less capable a region or province is at fulfilling all necessary production and final demand requirements, all things being equal, the lower the eventual economic impact will be.

Appendix 2: Glossary of Terms Used by STEAM$^{2.0}$

GDP (at factor cost) - This figure represents the total value of production of goods and services produced by industries resulting from the factors of production. The distinction to GDP (at market prices) is that GDP (at factor cost) is less by the amount of indirect taxes plus subsidies.

Wages & Salaries - This figure represents the amount of wages and salaries generated by the initial expenditure. This information is broken down by the direct, indirect and induced impacts.

Employment - Depending upon the selection of employment units (person-years or equivalent full-year jobs) these figures represent the employment generated by the initial expenditure. These figures distinguish between the direct, indirect and induced impact. "Equivalent Full-Year Jobs", if selected, include both part-time and full-time work in ratios consistent with the specific industries.

- **NOTE:** The multiplier (B) is analogous to Multiplier (B) described earlier with the exception being that employment values are represented per $1,000,000 of spending rather than per dollar of spending. This is done to alleviate the problem of comparing very small numbers that would be generated using the traditional notion of a multiplier (i.e. employment per dollar of initial expenditure).

Industry Output - These figures represent the direct & indirect and total impact (including induced impacts) on industry output generated by the initial tourism expenditure. It should be noted that the industry output measure represents the **sum** total of all economic activity that has taken place and consequently involve double counting on the part of the intermediate production phase. Since the Gross Domestic Product (GDP) figure includes only the **net** total of all economic activity (i.e. considers only the value added), the industry output measure will always exceed or at least equal the value of GDP.

Taxes - These figures represent the amount of taxes contributed to municipal, provincial and federal levels of government relating to the project under analysis. This information is broken down by the direct, indirect and induced impacts.

Imports - These figures indicate the direct, indirect and induced final demand and intermediate production requirements for imports both outside the province and internationally.