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BRITISH PACIFIC PROPERTIES

Mountain Biking Economic Impact Study – North Shore

October 2017

Summary: Mountain Biking on the North Shore 2016

Mountain biking is an important activity on the North Shore, with 22,000 riders taking 433,000 rides in 2016. While the majority of rides were made by North Shore or Metro Vancouver residents, 12,000 riders from outside Metro Vancouver travelled to ride the North Shore trails in 2016.

The spending of non-resident visitors to the North Shore who rode on the mountain bike trail system in 2016, along with the spending of the NSMBA totaled $12.8 million, supporting $19.5 million in economic activity in British Columbia including $16.6 million of economic activity throughout the North Shore. These expenditures supported $5.7 million in wages and salaries in the province through the support of 102 jobs, of which 80 jobs and $4.3 million in wages and salaries were supported on the North Shore. The total net economic activity (GDP) generated by visitors to the North Shore trail system in 2016 was $10.7 million for Canada as a whole; $8.9 million for British Columbia and $6.4 million on the North Shore.

Mountain biking on the North Shore trail system also supported tax revenues totaling $3.7 million when considering Canada as a whole including federal government tax revenues of $1.7 million and $1.5 million in taxes accruing to the Province of British Columbia. Moreover, $241,000 in municipal taxes were supported in the province, of which $204,000 was on the North Shore.

Mountain Biking on the North Shore 2016 by the Numbers

11,992 riders from outside Metro Vancouver	**$12.1** million in visitor spending directly attributable to mountain biking on the North Shore	**80** North Shore jobs supported by the tourism expenditures of mountain bikers	**66%** of out-of-town riders stayed overnight while riding the North Shore trails
61,620 rides on North Shore trails made by visitors	**$4.3** million of wages and salaries supported on the North Shore	**$8.9** million boost to provincial GDP	**$1.5** million 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 on the North Shore.

Surveys were collected at 4 locations (Fromme parking lot, Old Buck, Cypress base and Hyannis) from June 22 to September 3, 2016. Interviewing shifts were staggered and covered morning, mid-day, and early evening throughout the summer on both weekdays and weekends. A total of 274 surveys were conducted.

Comparing 2016 to 2006

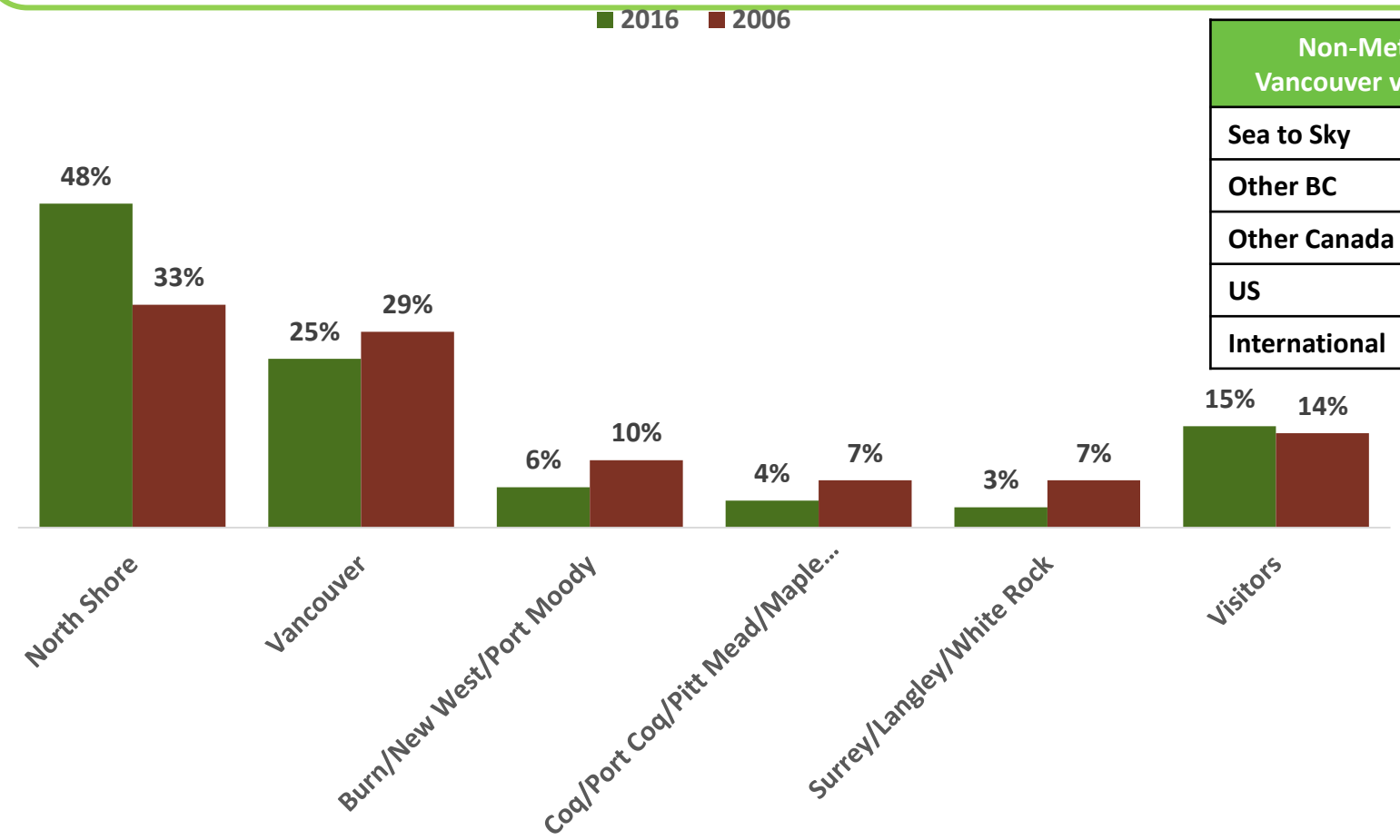
- When 2016 results are compared to the equivalent data from the 2006 study, significant increases are evident.

	2006*	2016
Rides per year North Shore Residents Metro Vancouver Residents Visitors	 23,113* 38,521* 9,805*	 208,577 162,753 61,624
Spending by Metro Vancouver residents and visitors	$2.1M*	$12.1M

*2006 figures adjusted to reflect full year estimates to compare to 2016 results

Respondent Origin

- The largest trail user group remains North Shore residents, who comprised almost half of respondents in 2016 (up from 33% in 2006).
- A quarter reside in Vancouver (down from 29% in 2006), and another 13% live in Metro Vancouver suburbs. These riders are considered day visitors to the North Shore.
- Similar to 2006, just 15% of riders reside beyond Metro Vancouver and are true visitors.



Non-Metro Vancouver visitors	
Sea to Sky	4%
Other BC	2%
Other Canada	4%
US	4%
International	1%

Where is your primary place of residence?

Non – BC Visitor Origin

- As noted on the previous slide, just 9% of North Shore riders reside outside BC.
- Sample sizes are very small, but results suggest Ontario and Colorado are the top visitor markets.

North America Origin	
Province (n=9)	**Responses (#)**
Alberta	3
Ontario	5
New Brunswick	1
State (n=11)	**Responses (#)**
Washington	2
Colorado	4
California	2
Oregon	2
Texas	1

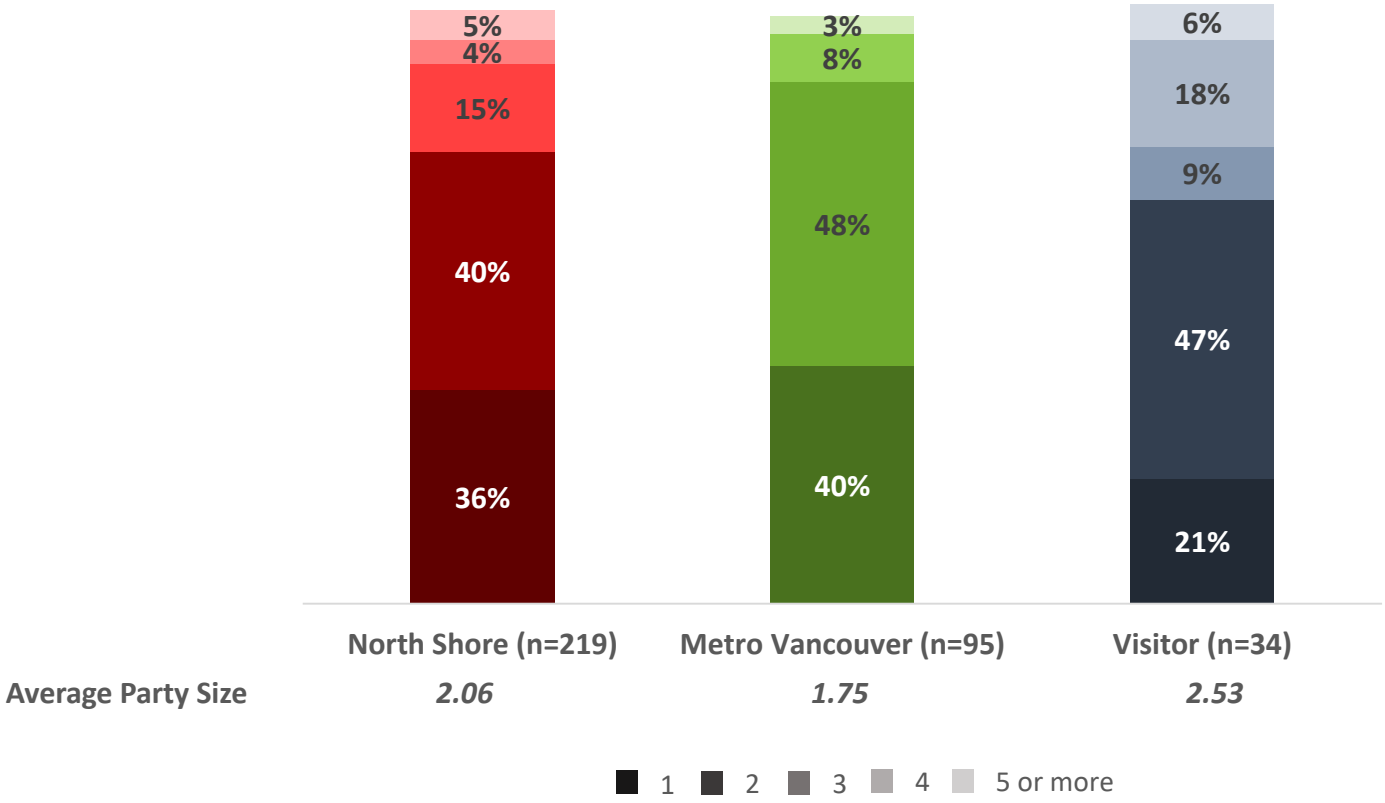
What province/state are you from?

International Origin	
Country (n=2)	**Responses (#)**
Brazil	1
Egypt	1

What country are you from?

Riding Party Size

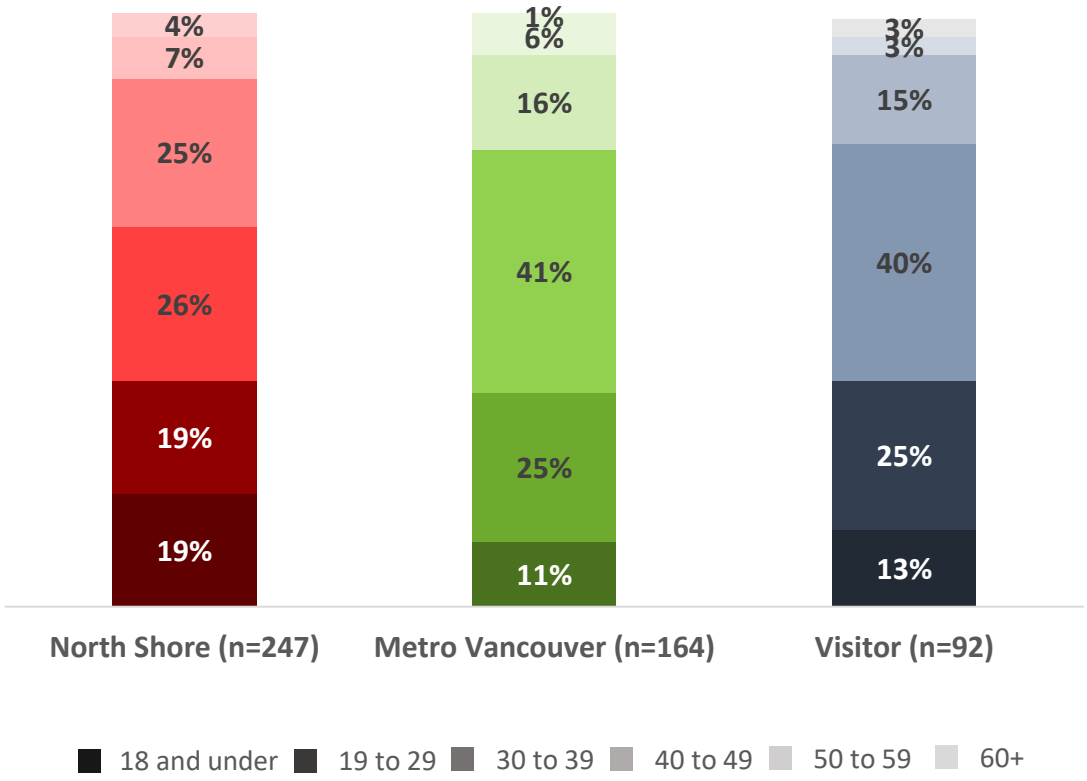
- Respondents were asked several questions about those they were riding with (referred to as Riding Party).
- Riding party sizes were notably smaller among North Shore and Metro Vancouver riders with 76% and 88% of riding parties comprised of 1 or 2 people.
- Visitors tend to be in larger groups (average party size is just under 3 riders).



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

Riding Party Ages

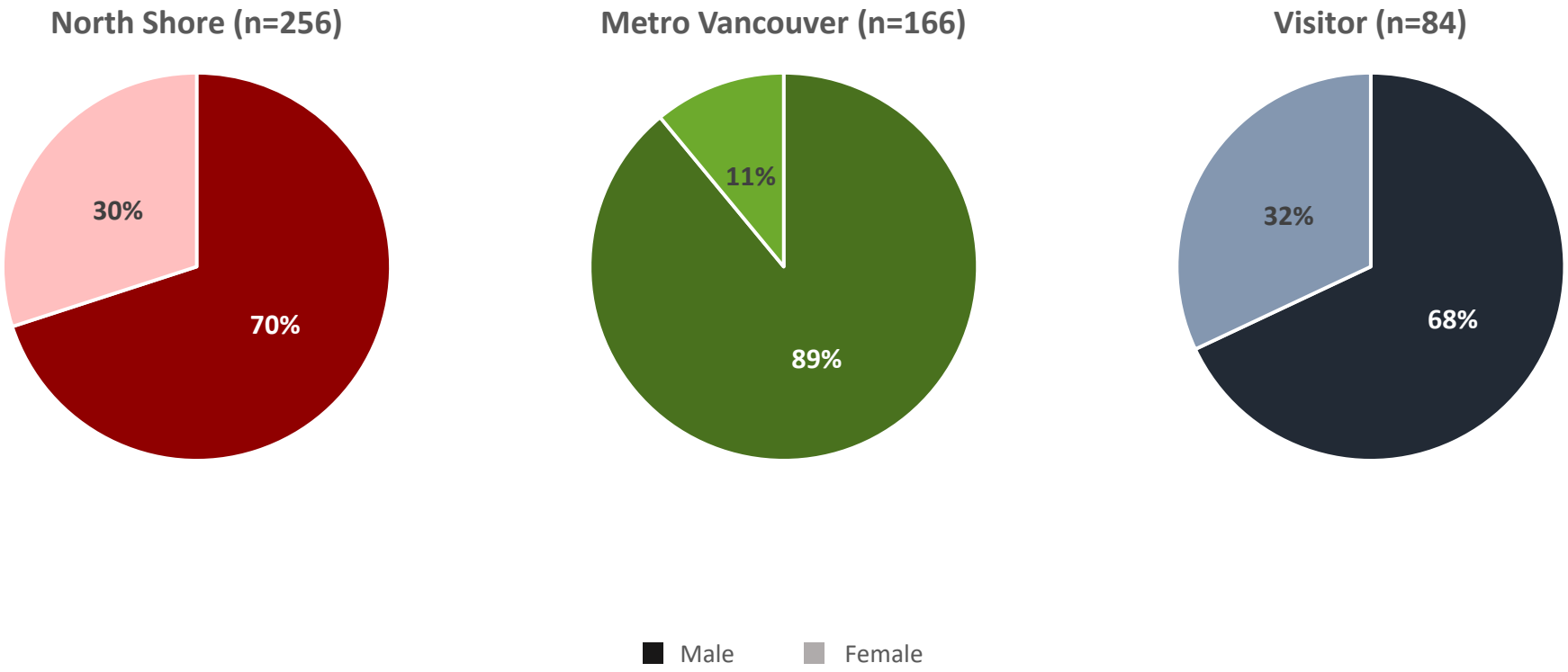
- North Shore riding parties were diverse in terms of age, with roughly one-quarter being 30-39 and 40-49 years and almost as many being 19-29 years or under 18.
- Metro Vancouver and visiting riders were more likely to be 30-39 years followed by 20-29 years.



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

Riding Party Gender

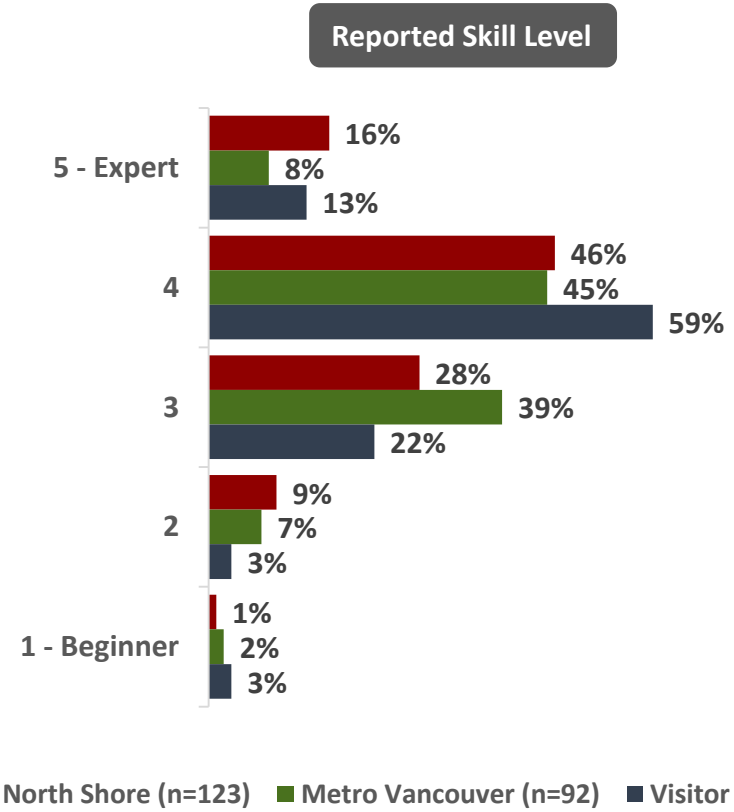
- Results show that the majority of riders using the North Shore trail system are male, with an overall average of 76% male.



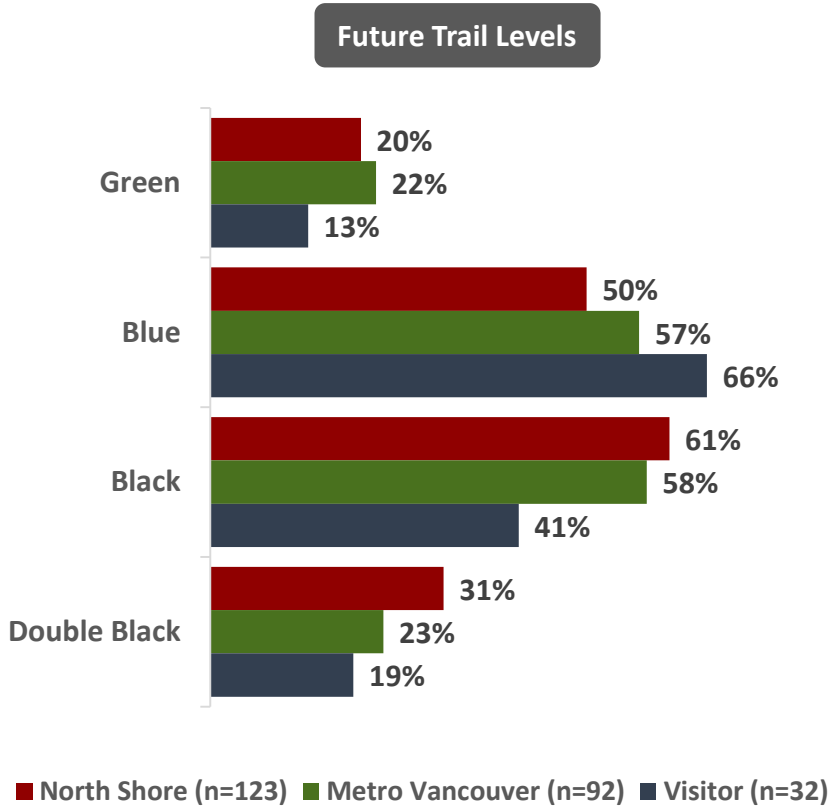
Gender distribution of party: (including the respondent)

Skill Level

- Riders were asked about the skill level of the riding group. The majority rates the riding party's skill level as advanced or expert.
- Not surprisingly, when riders were asked about the level that future trails should be, they primarily chose blue or black (note riders were allowed to make 2 selections). Note that visitors were most likely to suggest more blue trails.



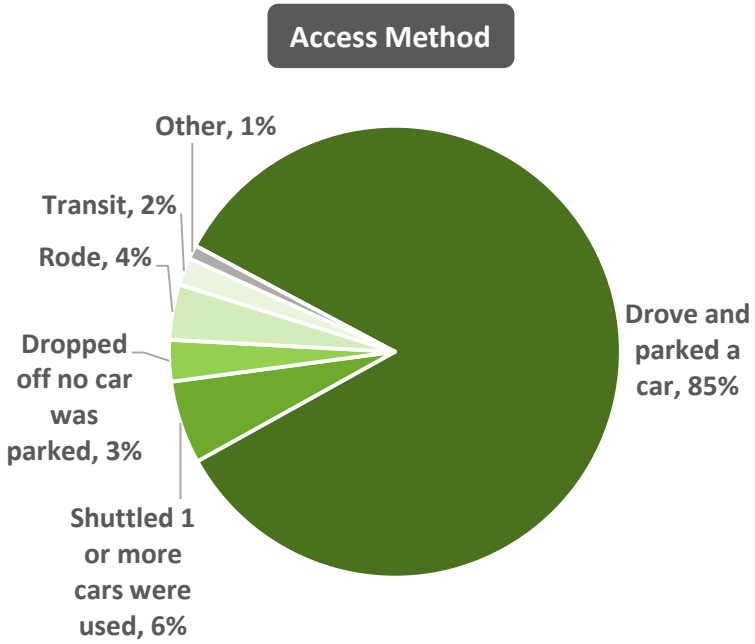
On a scale of 1 to 5 with 1 meaning beginner and 5 meaning expert, how would you rate the skill level of your group?



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

Trailhead Access

- Riders were asked how they got to the trailhead, with the vast majority using a car.
- Most vehicle users parked in a dedicated parking lot (rather than street parking).

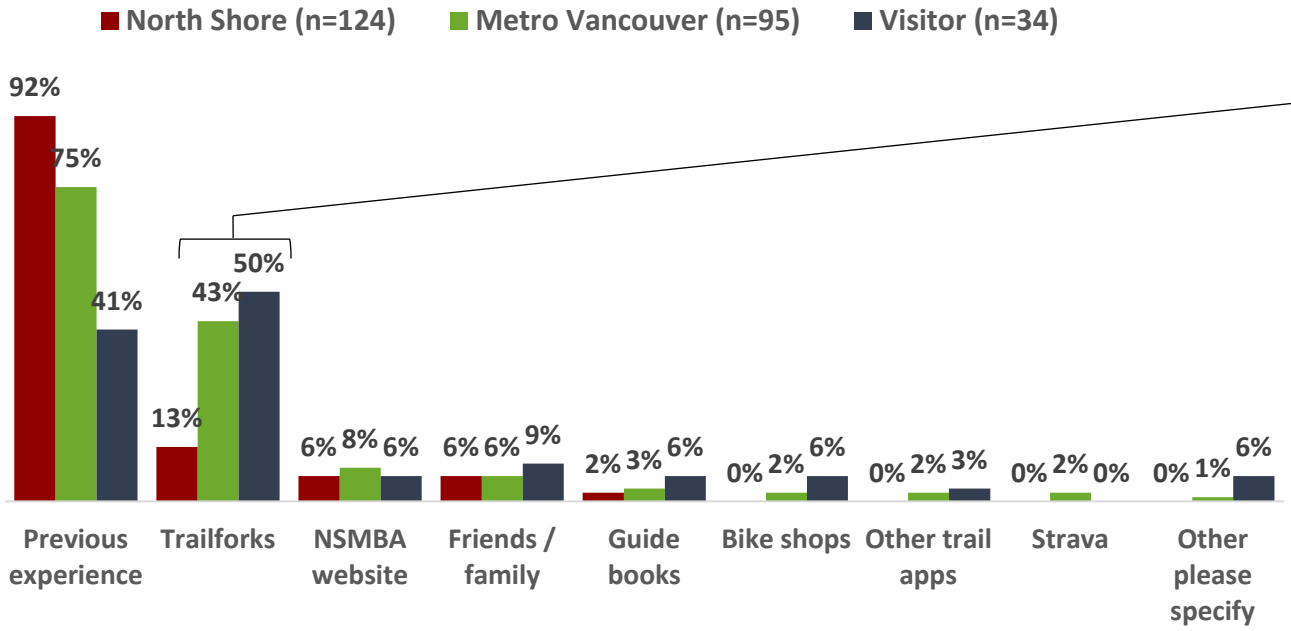


	Survey Location			
	Bottom of Fromme	Old Buck	Cypress base	Hyannis
Fromme parking lot	94%	10%	0%	0%
Old Buck parking lot	0%	73%	0%	2%
Side streets near Old Buck	0%	10%	0%	0%
Hyannis area	0%	0%	0%	95%
Bottom of Cypress	0%	0%	100%	0%
Mountain Highway or side streets eg Coleman DempseyBraemer	4%	2%	0%	0%
Mushroom parking lot	0%	2%	0%	0%
Top of Seymour	0%	2%	0%	0%
Deep Cove	0%	2%	0%	0%

How did you get to the trailhead today?

Information Sources

- For North Shore and Metro Vancouver residents, previous experience was the most common source of information for riding on the North Shore. Nearly half of visiting riders also cited previous experience.
- Trailforks was used by 50% of visitors and was most heavily used by those residing in other parts of BC and in the US.

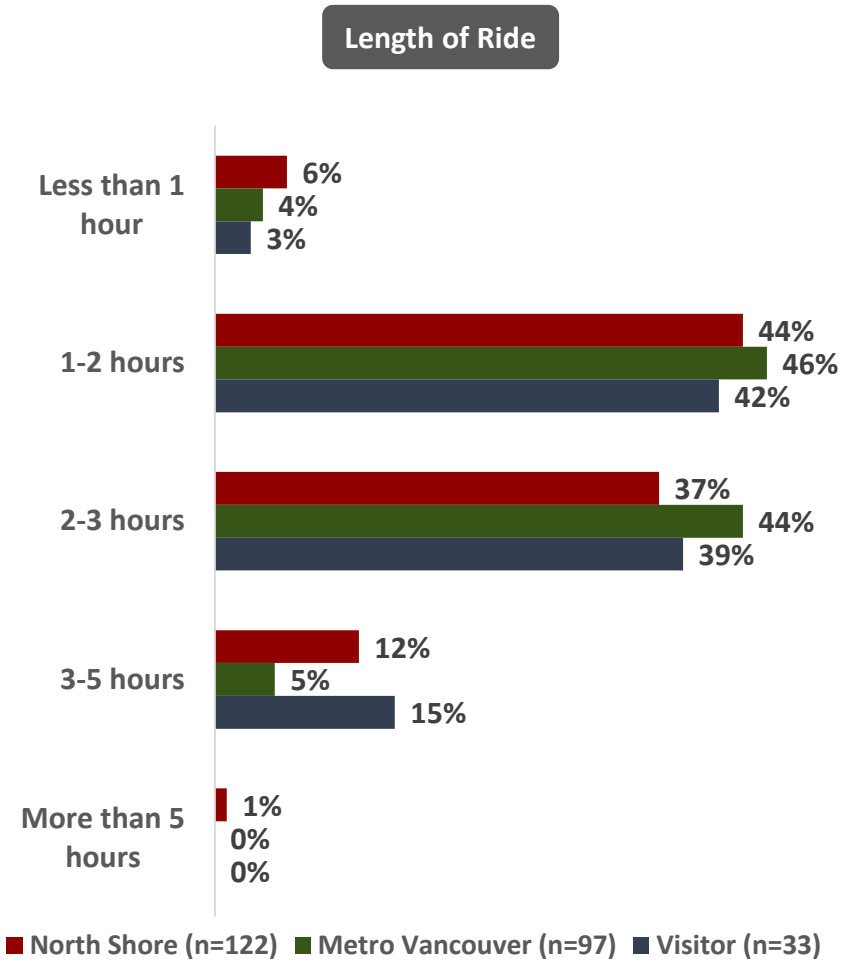


Trailforks Use Origin (n=274)	
North Shore	13%
Metro Vancouver	43%
Whistler	20%
Squamish	40%
Other BC	67%
Other Canada	36%
US	60%
International	0%

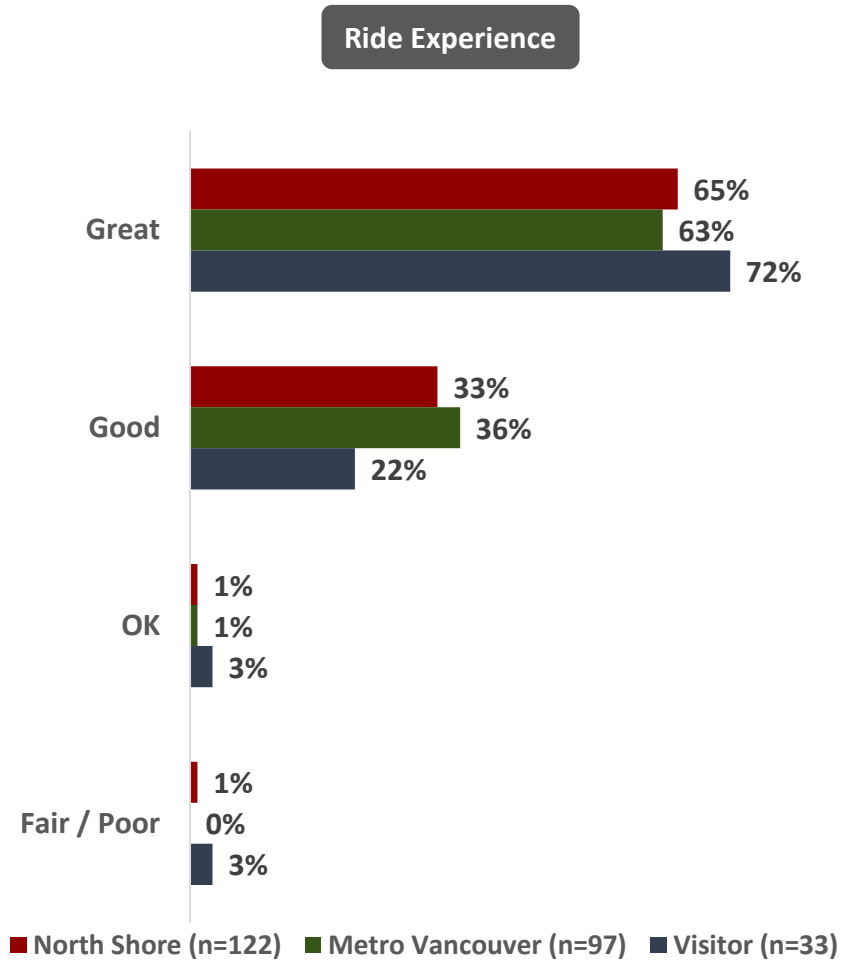
Which of the following information sources did you use to plan your ride today? (Select all that apply)

Ride Length and Overall Experience

- Most North Shore rides are 1-3 hours in length.
- Almost all riders provided a positive assessment of their ride, with visitors most likely to indicate it was great.



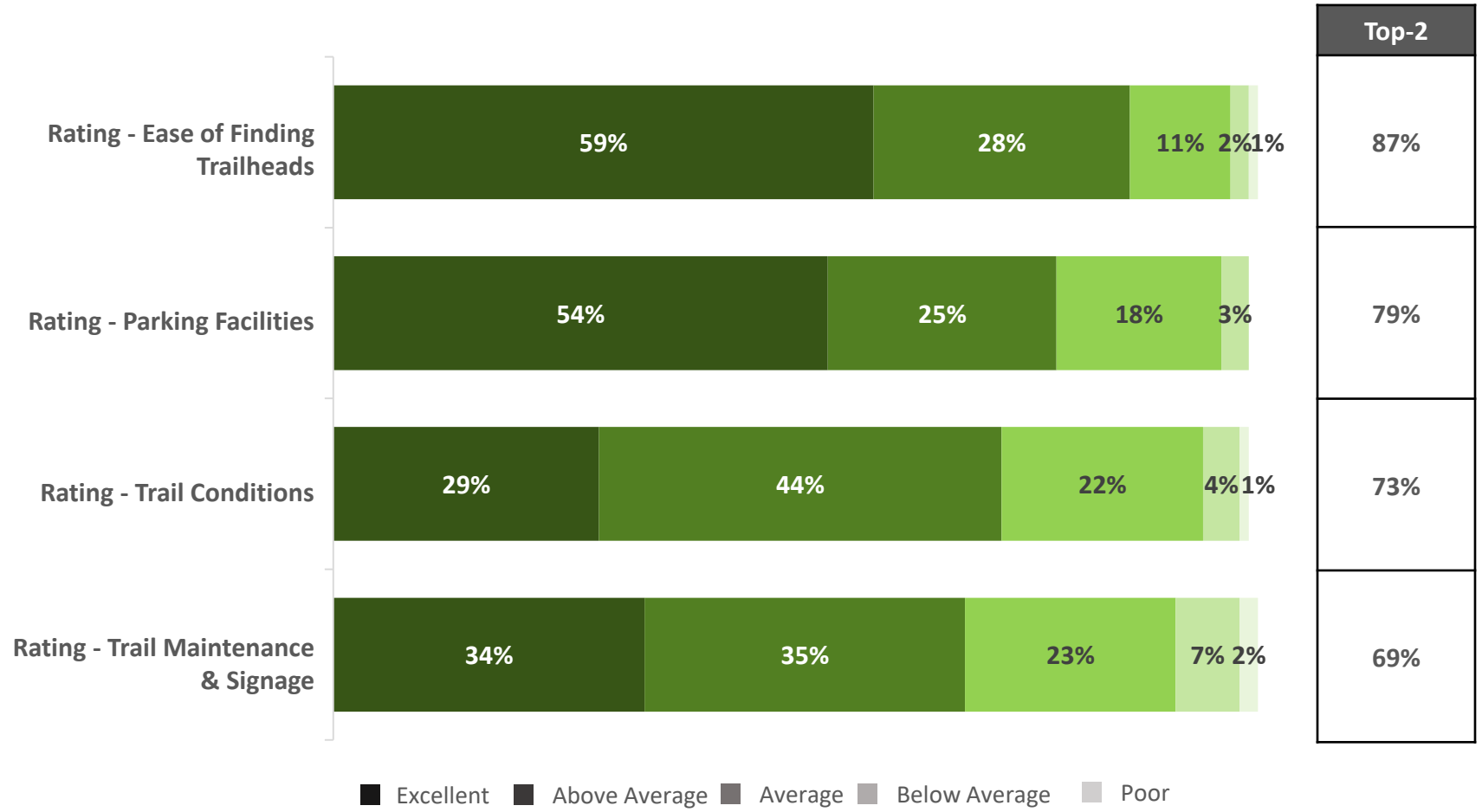
How long was your ride / are you planning to ride?



How would you rate your ride experience today?

Satisfaction with Aspects of the Ride

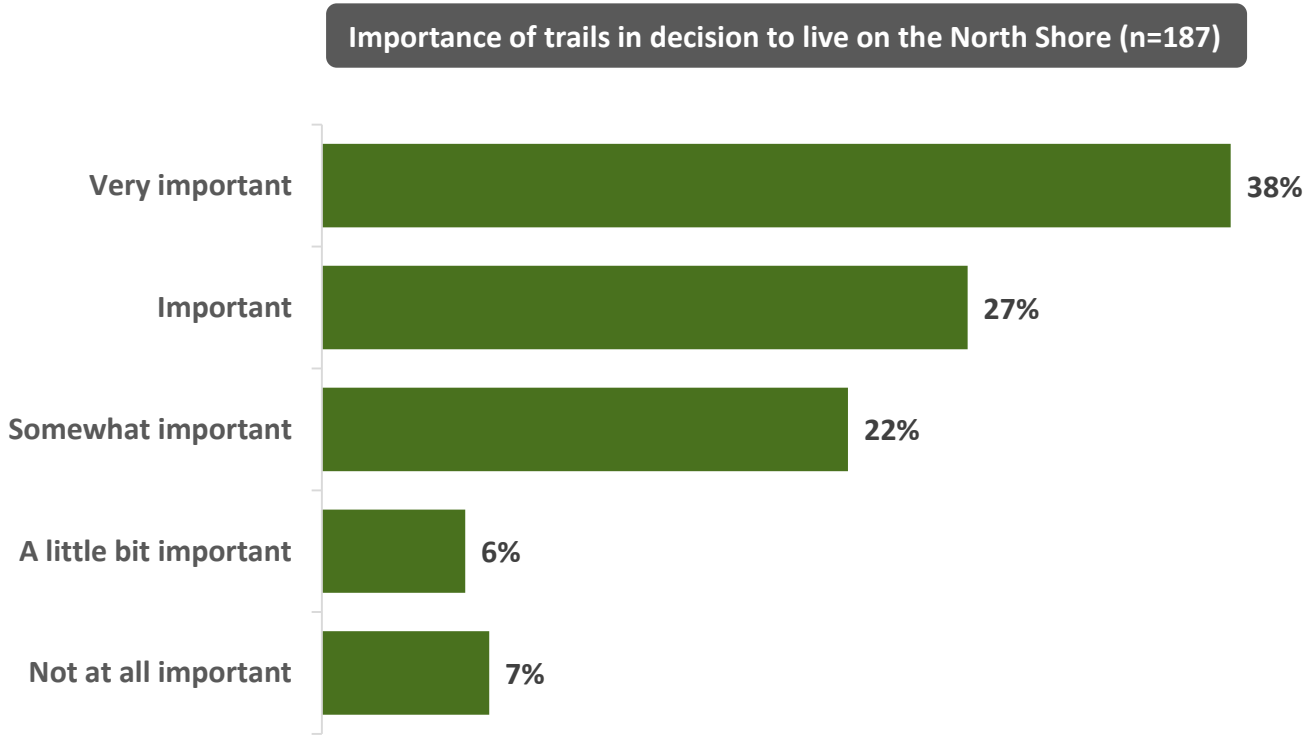
- Respondents were asked about specific aspects of their North Shore riding experience
- Generally, trail users are satisfied with all aspects of their ride. They indicate the greatest satisfaction with ease of finding trailheads and parking.



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

Importance of Trails to North Shore Residents

- North Shore riders were asked about the importance of the trail system in their decision to live on the North Shore.
- Nearly two-thirds (65%) said the trails were an important factor in their decision to live on the North Shore.
- While the trails are important, the importance level was lower than observed in Squamish (82%).



How important are/were the trails in your decision to live on the North Shore?

Net Promoter Score

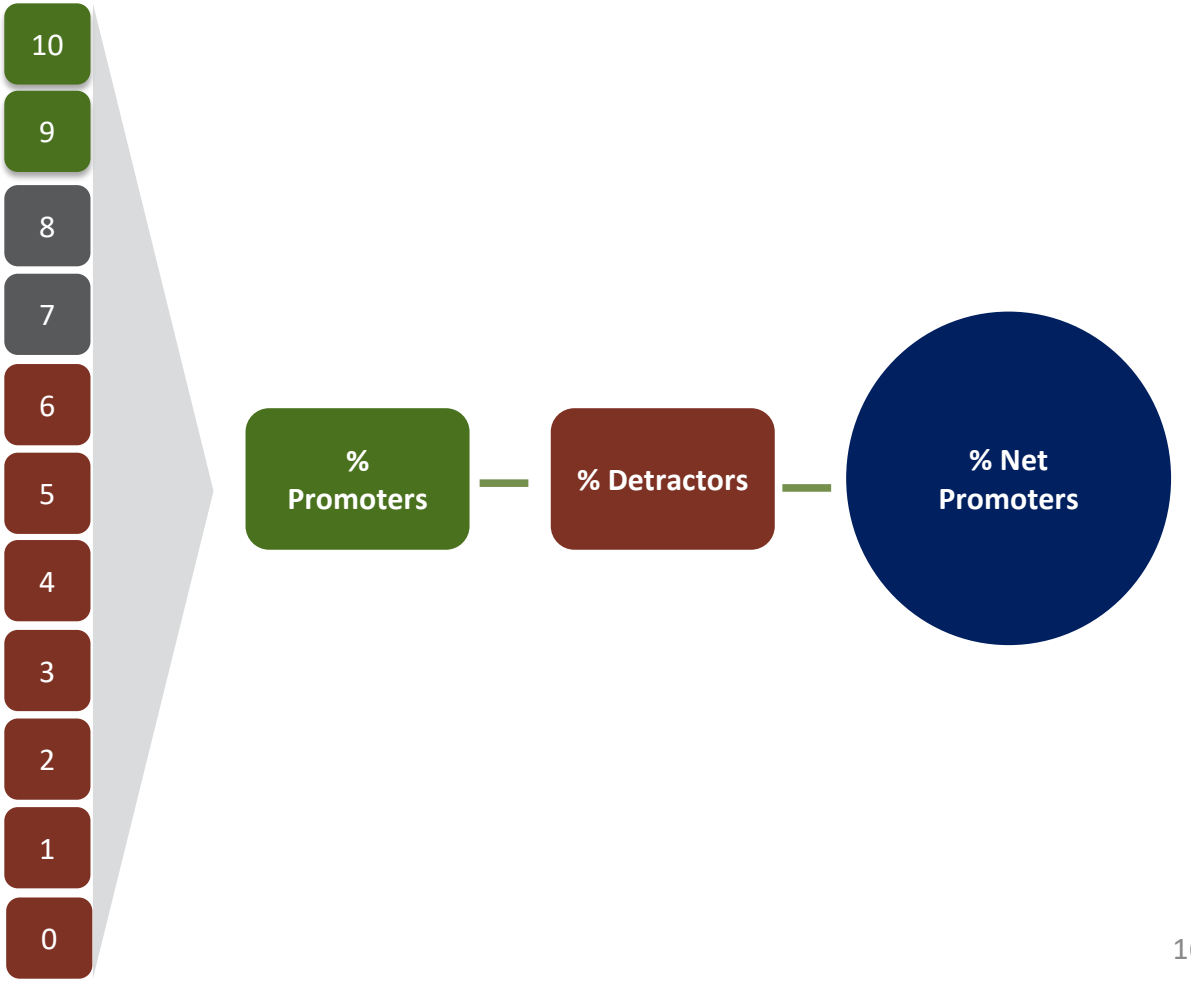
The Net Promoter Score (NPS) is a metric that helps organizations monitor the engagement of their customers. It reflects the likelihood that someone will recommend a product/company/place to friends, family or colleagues. In the context of the tourism industry, NPS is based on responses to the question, “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.

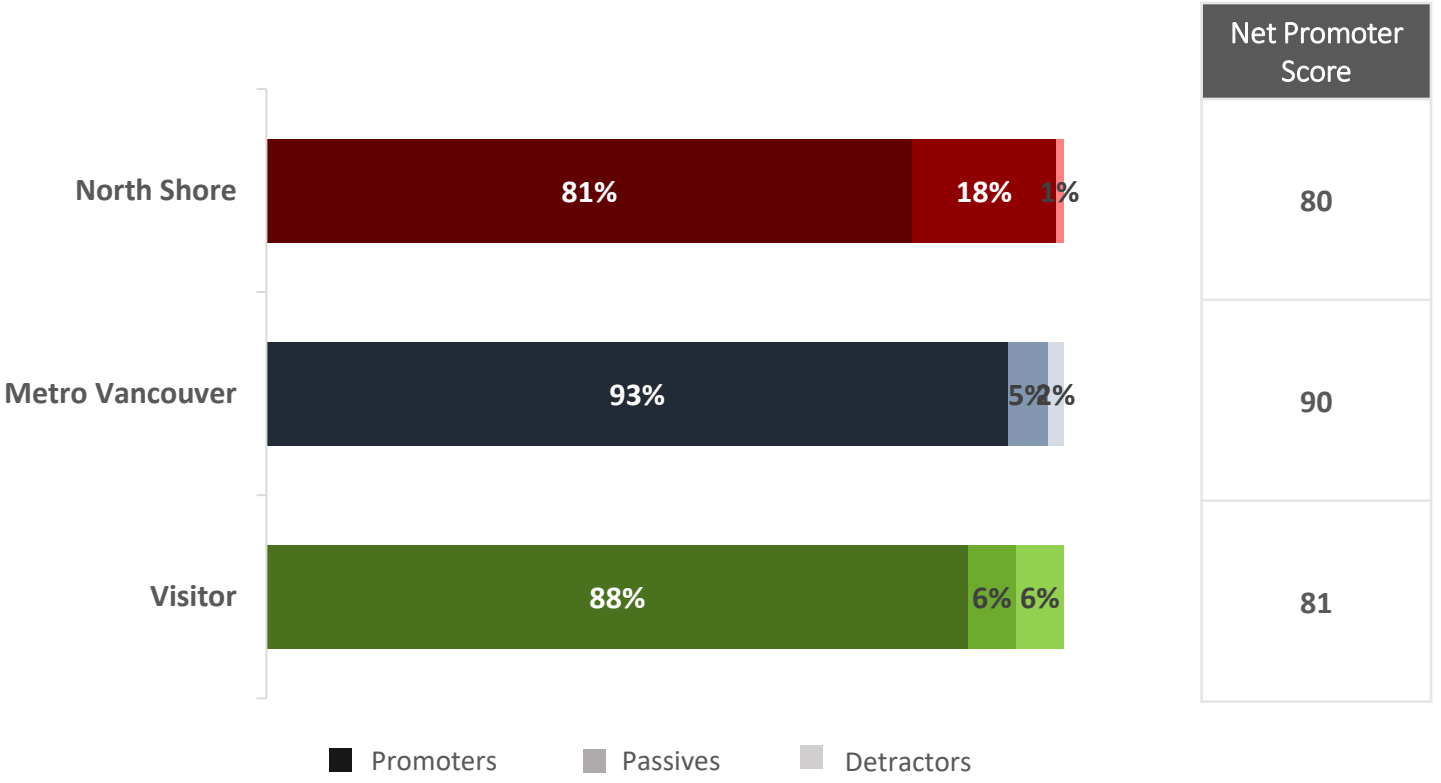
7-8 Passives
Marginally satisfied visitors not excited enough to tell others about their experience.

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.



Net Promoter Score

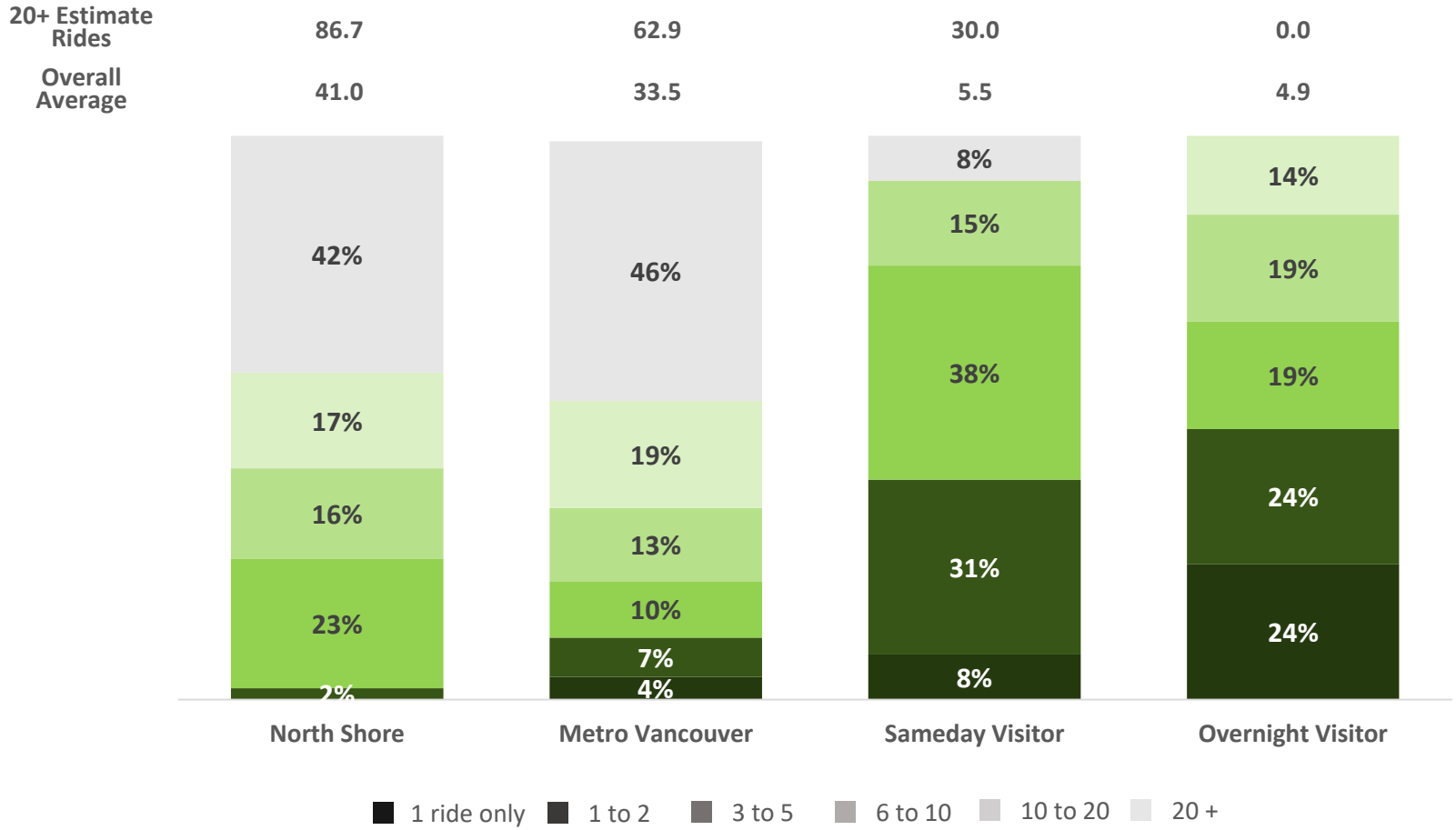
- Riders were asked how likely they were to recommend the North Shore as a riding destination using a scale of 0 meaning extremely unlikely and 10 meaning extremely likely.
- A Net Promoter Score (NPS) was calculated by subtracting the number of Detractors (rating 0-6) from the Promoters (rating 9-10).
- The Net Promoter Score provided by North Shore residents was +80 and +81 among visitors, rising to +90 for Metro Vancouver residents, meaning there is considerable potential for locals and visitors to be advocates for the North Shore trail system.



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

North Shore Rides per Year

- Riders were asked about the number of times they rode the North Shore trails in the past year.
- A large number of North Shore and Metro Vancouver riders indicated that they rode North Shore trails 2-3 times per week all year. This resulted in an average frequency of 41 rides per year on North Shore trails among residents and 34 rides annually among Metro Vancouver residents.



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

Ride per Year – Other Sea to Sky

- Respondents were also asked to detail riding behaviour in other Sea to Sky communities.
- Regardless of residency, Squamish was the most popular Sea to Sky riding destination.

Rider Origin	North Shore				Metro Vancouver				Visitor			
Region	Whistler Bike Park	Whistler Trails	Squamish	Pemberton	Whistler Bike Park	Whistler Trails	Squamish	Pemberton	Whistler Bike Park	Whistler Trails	Squamish	Pemberton
None	49%	45%	23%	80%	48%	58%	32%	86%	65%	65%	50%	76%
1-2	22%	16%	20%	7%	22%	16%	20%	9%	12%	18%	21%	15%
3-5	15%	25%	28%	8%	19%	15%	15%	2%	3%	9%	15%	0%
6-10	5%	6%	16%	3%	6%	7%	12%	2%	6%	0%	3%	0%
10-20	7%	8%	10%	1%	5%	2%	15%	0%	12%	6%	0%	6%
More than 20	2%	1%	3%	0%	0%	1%	5%	0%	3%	3%	12%	3%

Over the last 12 months, did you ride in any of the following areas? (select all that apply)

Rides in Other Destinations

- Riders were also asked what other destinations they rode in over the past 12 months.
- Other areas in the Vancouver Coast and Mountains were the most common followed by Vancouver Island and the US.

	Riding Destination								
	Other places in Vancouver Coast Mountains	Vancouver Island	Thompson Okanagan	Kootenay Rockies	Cariboo Chilcotin Coast	Northern BC	Other Canada	US	International
North Shore	54%	19%	16%	7%	4%	15%	10%	11%	4%
Metro Vancouver	55%	24%	27%	15%	7%	12%	2%	20%	6%
Visitor	26%	26%	15%	29%	9%	18%	15%	38%	15%
Overall	51%	22%	20%	13%	6%	14%	8%	18%	6%

Over the last 12 months, did you ride in any of the following areas? (select all that apply)

Rider Volume Calculations

- A key calculation in the economic impact assessment is determining the number of rides that took place on the North Shore. The District of North Vancouver reported an average of 9,723 cars per month at the Fromme parking lot from September 2015 through to March 2016. Using Trailforks data, we calculated the number of rides on Mountain Highway over the same period and found that the September – March time period averaged 81% of the annual monthly average. As a result, the average monthly parking lot count was scaled up to 12,085 cars per month in 2016, for a grand total of 145,021 cars. The surveyors employed by the MBTA kept careful track of the different types of users that passed by them during their shifts and reported that mountain bikes represented 61% of overall volume, hikers were 25% and dog walkers / other users were 13% of trail users. Applying this same ratio to the parking lot counts suggest there were 88,860 cars at the Fromme parking lot. Multiplying the number of cars by the average riding party size of 1.9 people, and adjusting for the number of riders who accessed Fromme without a car (8%) and the number of riders who didn't park at the Fromme lot (4%) suggests there were 191,948 riders who rode Fromme in 2016.
- Again relying on Trailforks data, Fromme represented 44% of the North Shore riding area (Fromme, Cypress, Seymour, Lower Seymour Conservation Reserve), indicating a total of 432,955 rides in 2016.
- The overall volume of rides calculated using the parking lot count is consistent with the rider volume estimates developed for the other regions covered in this study (Squamish, Pemberton) when comparing the total number of rides reported on Trailforks for each region.
- The total number of rides was then split out based on rider origin.

	Origin (%)	Rides (#)
District of North Vancouver	22%	96,388
City of North Vancouver	20%	88,487
City of West Vancouver	5%	23,702
Vancouver	26%	110,609
Burnaby/New Westminster/Port Moody	6%	25,282
Coquitlam / Port Coquitlam / Pitt Meadows / Maple Ridge	4%	15,801
Surrey / Langley / White Rock	3%	11,061
Sea to Sky	4%	15,801
Other BC	2%	9,481
Other Canada	4%	17,381
US	4%	15,801
International	1%	3,160
Total	100%	432,955

Rider Volume Calculations

- Based on the calculated rider volume, the table below shows the estimated number of rides in each of North Shore riding area.

Region	Trailforks 2016 Ridelogs	Share of Ridelogs	Number of Rides
Cypress	633	6.8%	29,491
Seymour	3644	39.2%	169,771
LSCR	896	9.6%	41,744
Fromme	4120	44.3%	191,948
Total	**9293**	**100.0%**	**432,954**

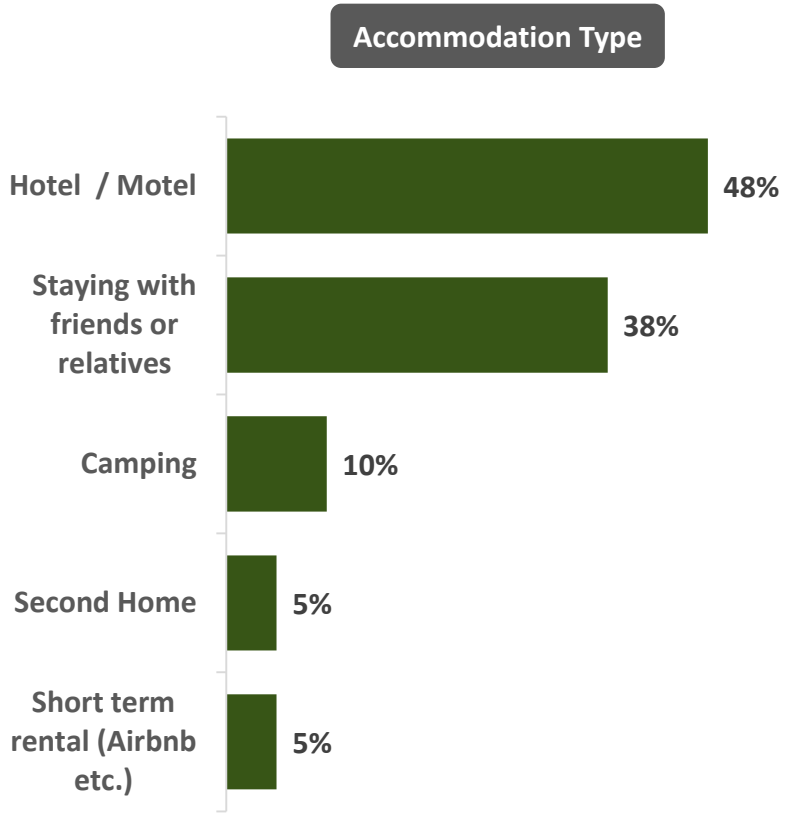
- The number of unique riders was calculated by dividing the total number of rides by the number of North Shore rides as reported to the surveyors. In total, there were an estimated 21,941 individuals who rode North Shore trails.
- For the purposes of calculating total spending on the North Shore, the number of rides is used for Metro Vancouver and sameday visitors, while the number of riders is used for overnight visitors.

	Rides	Rides p.p.	Riders
North Shore	208,577	41	5,093
Metro Vancouver	162,753	34	4,856
Non-GVRD Visitors	61,624	5.1	11,992
Total	**432,954**	**19.7**	**21,941**
Non-GVRD Sameday Visitors	*22,889*	*5.5*	*4,133*
Non-GVRD Overnight Visitors	*38,735*	*5.0*	*7,859*

Over the last 12 months, did you ride in any of the following areas? (select all that apply)

Rider Origin and Accommodation Type

- Overnight visitors from outside of Metro Vancouver were asked about the kind of accommodation that they used while riding on the North Shore
- The survey found that almost half of riders stayed in commercial accommodation (48%) followed by staying with friends and relatives and camping.

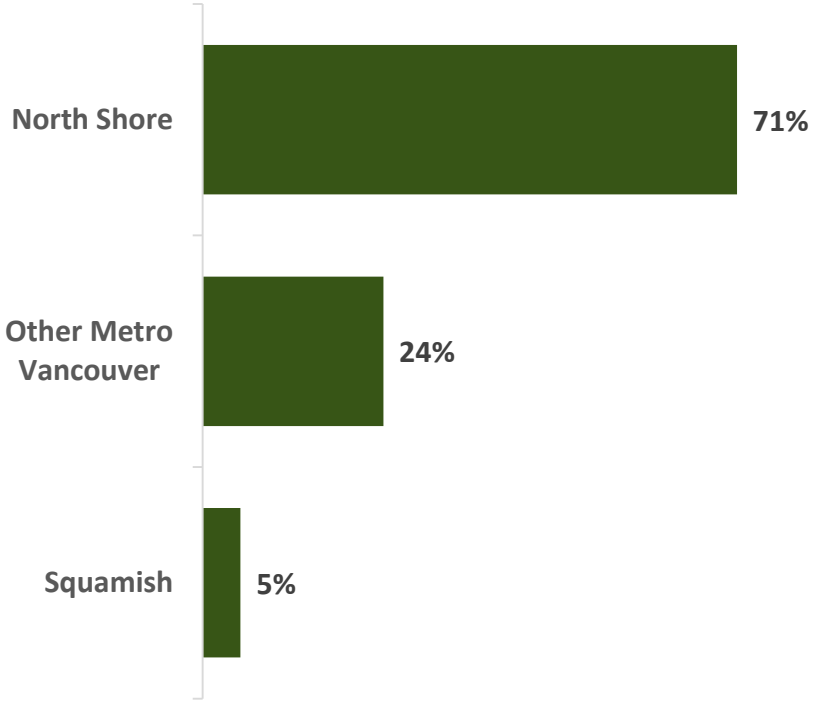


What kind of accommodation are you using on this trip?

Overnight Community and Length of Stay

- Overnight visitors were asked where they were staying. The majority (71%) stayed on the North Shore.
- While sample sizes are small, results suggest visitors who stay exclusively on the North Shore spend an average of 6.9 nights.
- Riders who spent part of their trip on the North Shore spent 5.1 nights in the region and an additional 5 nights elsewhere in BC.

Overnight Community



Length of Stay

Length of Stay while riding on the North Shore (n=19)	Share (%)
All nights in overnight community	63%
Nights	6.9
Trip includes nights in other parts of BC	37%
Nights on North Shore	5.1
Nights in other parts of BC	5.0
Nights outside of BC	2.0

Where are you staying overnight?

How many nights are you away from home on this trip?

Visitor Spending – per person

- Non-resident riders were asked how much they spent on North Shore on this visit (North Shore residents were not asked about expenditures as their spending does not represent new money in the community, but Metro Vancouver residents are included). The average spend was $70, with restaurants ($20) and bike shops ($15) accounting for the majority of spending.
- Overnight visitors reported the highest average expenditures ($861), but results should be interpreted with caution as sample sizes are very small.

	Metro Vancouver *(spend per ride)*	Other Sameday Visitor* *(spend per ride)*	Overnight Visitor* *(spend per trip)*	Average
Accommodation	$0.00	$0.00	$264.79	$10.75
Restaurants	$10.95	$24.39	$185.85	$19.64
Other Food & Bev	$1.29	$3.11	$92.33	$5.20
Recreation & Entertainment	$1.01	$0.00	$53.58	$3.02
Bike Shops (Parts / Repairs / Bikes)	$13.86	$2.73	$76.98	$15.11
Other Shopping	$1.32	$7.72	$33.99	$3.41
Local Transporation	$4.77	$20.54	$153.38	$12.67
Total excluding Transport	**$33.20**	**$58.49**	**$860.89**	**$69.81**

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

* Small sample size

Visitor Spending – aggregate

- The number of visits was calculated for each spending category, which was then multiplied by the spending per visit.
- In total, non-North Shore riders spent over $13.5 million on the North Shore. While comprising a small proportion of trail users, overnight visitors account for approximately half of visitor spending.

	Metro Vancouver	Other Sameday Visitor	Overnight Visitor	Total
Visits	*162,753*	*22,889*	*7,859*	*193,501*
Accommodation	$0	$0	$2,080,967	$2,080,967
Restaurants	$1,782,365	$558,196	$1,460,615	$3,801,176
Other Food & Bev	$209,380	$71,199	$725,601	$1,006,179
Recreation & Entertainment	$163,633	$0	$421,050	$584,683
Bike Shops (Parts / Repairs / Bikes)	$2,255,669	$62,444	$604,973	$2,923,086
Other Shopping	$215,538	$176,678	$267,149	$659,365
Local Transporation	$776,816	$470,227	$1,205,395	$2,452,438
Total excluding Transport	**$5,403,400**	**$1,338,743**	**$6,765,751**	**$13,507,893**

Visitor Spending – scaled by importance

- The final step was to calculated the importance of the North Shore trail system in the riders decision to travel to the North Shore using a scale of 1 (not at all important) to 10 (very important).
- The importance factor was then used to calculated the total spending on the North Shore that was directly attributable to the trails, which reached $12.1 million in 2016.

	Metro Vancouver	Other Sameday Visitor	Overnight Visitor	Total
Importance (1-10)	*9.85*	*9.58*	*8.11*	*8.95*
Accommodation	$0	$0	$1,687,896	$1,687,896
Restaurants	$1,755,360	$534,938	$1,184,721	$3,475,019
Other Food & Bev	$206,207	$68,232	$588,543	$862,982
Recreation & Entertainment	$161,153	$0	$341,518	$502,672
Bike Shops (Parts / Repairs / Bikes)	$2,221,492	$59,842	$490,701	$2,772,034
Other Shopping	$212,272	$169,316	$216,688	$598,276
Local Transporation	$765,046	$450,634	$977,710	$2,193,389
Total excluding Transport	**$5,321,530**	**$1,282,962**	**$5,487,776**	**$12,092,267**

Operational Spending

- The North Shore Mountain Bike Association (NSMBA) conducts most of the mountain biking trail maintenance on the North Shore, with an annual budget of approximately $335,000. In addition, the District of North Vancouver spends an average of $400,000 per year on trail related capital infrastructure projects.

nsmba | TRAILS FOR ALL TRAILS FOREVER

Economic Impact Results

The spending of non-resident visitors to the North Shore who rode on the mountain bike trail system in 2016, along with the spending of the NSMBA totaled $12.8 million, supporting $19.5 million in economic activity in British Columbia including $16.6 million of economic activity throughout the North Shore. These expenditures supported $5.7 million in wages and salaries in the province through the support of 102 jobs, of which 80 jobs and $4.3 million in wages and salaries were supported on the North Shore.[1] The total net economic activity (GDP) generated by visitors to the North Shore trail system in 2016 was $10.7 million for Canada as a whole; $8.9 million for British Columbia and $6.4 million on the North Shore.

Mountain biking on the North Shore trail system also supported tax revenues totaling $3.7 million when considering Canada as a whole including federal government tax revenues of $1.7 million and $1.5 million in taxes accruing to the Province of British Columbia. Moreover, $241,000 in municipal taxes were supported in the province, of which $204,000 was on the North Shore.

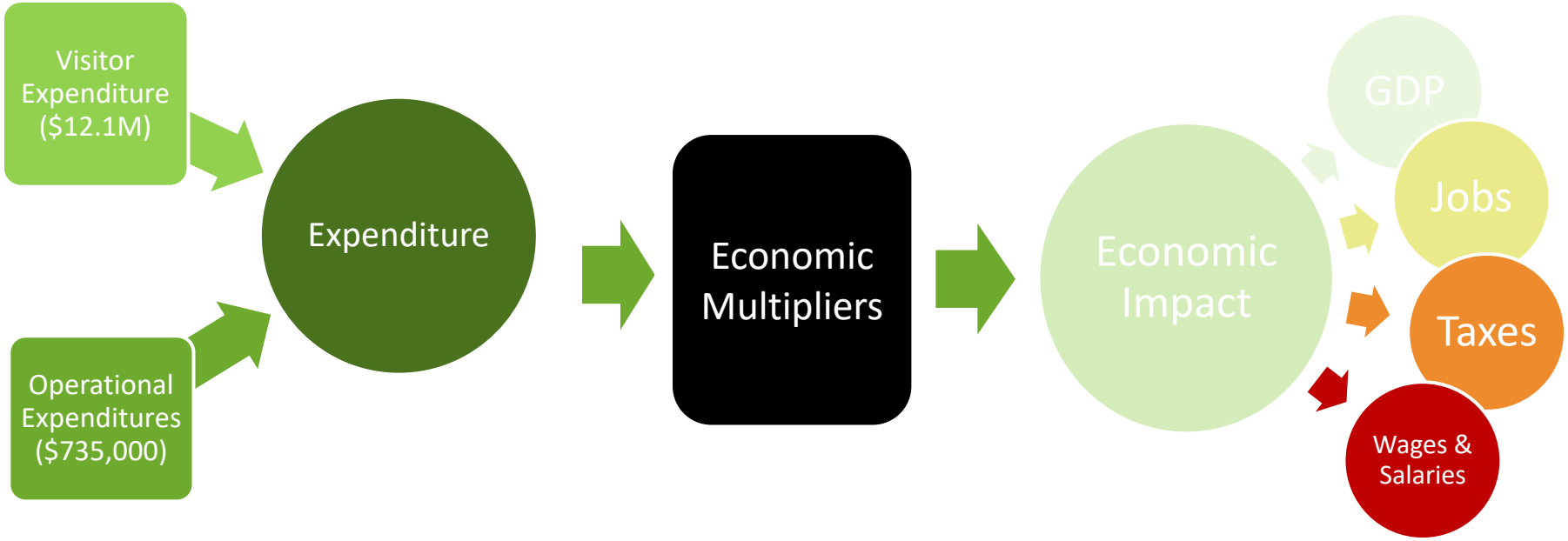
	North Shore	British Columbia	Canada
Initial Expenditure	$12,797,518	$12,797,518	$12,797,518
GDP	$6,359,247	$8,892,145	$10,727,435
Wages & Salaries	$4,284,749	$5,740,216	$6,732,825
Employment	79.8	101.9	126.1
Industry Output	$16,621,926	$19,489,512	$23,449,730
Total Taxes	$2,727,191	$3,281,842	$3,657,539
Federal	$1,304,791	$1,545,538	$1,729,252
Provincial	$1,218,119	$1,495,434	$1,606,413
Municipal	$204,280	$240,870	$321,874

[1] 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

	North Shore	British Columbia	Canada
Initial Expenditure	$12,797,518	$12,797,518	$12,797,518
Gross Domestic Product			
Direct Impact	$3,745,741	$4,542,755	$4,542,755
Indirect Impact	$1,391,991	$2,243,742	$3,273,868
Induced Impact	$1,221,515	$2,105,649	$2,910,813
Total Impact	$6,359,247	$8,892,145	$10,727,435
Industry Output			
Direct & Indirect	$14,758,363	$16,277,100	$18,677,208
Induced Impact	$1,863,563	$3,212,412	$4,772,522
Total Impact	$16,621,926	$19,489,512	$23,449,730
Wages & Salaries			
Direct Impact	$2,925,927	$3,414,578	$3,414,578
Indirect Impact	$896,105	$1,438,541	$2,013,326
Induced Impact	$462,717	$887,098	$1,304,921
Total Impact	$4,284,749	$5,740,216	$6,732,825
Employment (Full-year jobs)			
Direct Impact	59.0	67.2	73.6
Indirect Impact	12.9	21.6	32.1
Induced Impact	7.9	13.2	20.4
Total Impact	79.8	101.9	126.1
Taxes (Total)			
Federal	$1,304,791	$1,545,538	$1,729,252
Provincial	$1,218,119	$1,495,434	$1,606,413
Municipal	$204,280	$240,870	$321,874
Total	$2,643,147	$3,178,308	$3,535,575

How Economic Impact Modelling Works



steam pro 2.0
real data • real time

Expenditures

- 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

Gross Domestic Product (GDP)

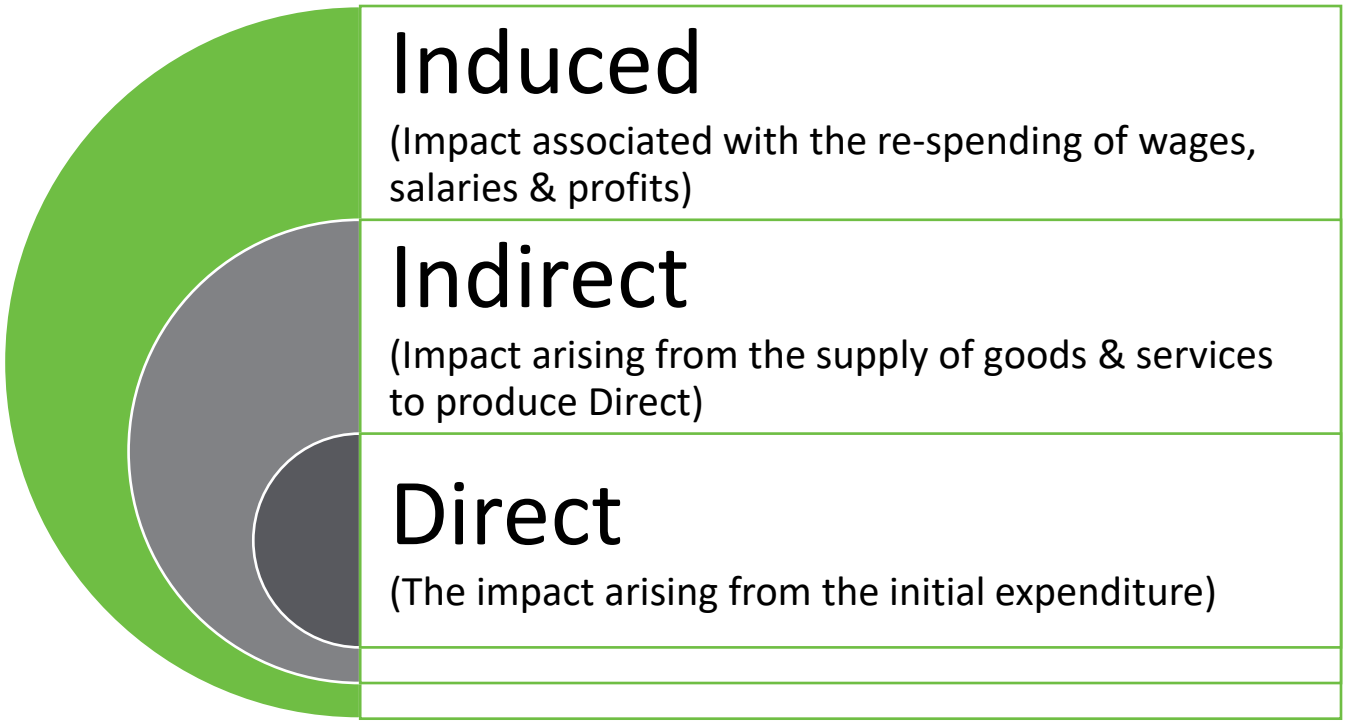
- Represents the total value of production of goods and services in the economy resulting from the initial expenditure under analysis
- This is a **NET** measure and represents the value of goods and services produced less the cost of inputs used. It also accounts for the value of any imports to the 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



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.