

Contingent valuation of the benefits of a non-motorized, multi-use community trail along the Vancouver Island Corridor north of Langford

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Friends of Rails to Trails Vancouver Island (FORT-VI)



Photo: Courtesy of FORT-VI

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This project is the result of a request from FORT-VI to faculty at the University of Victoria's School of Public Administration to develop an economic evaluation of the benefits of their rail-to-trail proposal for the Vancouver Island Corridor. I am deeply grateful to Alastair Craighead and Wilfrid Worland of FORT-VI for approaching the School of Public Administration at the University of Victoria with this research idea, and their consistent and ongoing feedback and provision of resources over the course of this research. I am also grateful to other dedicated FORT-VI board members and others, including Denise Savoie, Jim Smiley, and Jodi Appleton, and others who I may have missed, for providing pertinent information, useful feedback on the draft survey, and/or other assistance. Thanks are also due to all of the FORT-VI volunteer board members, other volunteers, and community groups, who assisted in the dissemination of the survey. Finally, thanks to all of the survey participants for taking the time to take the survey and to those who followed up with me with comments. Finally, I would also like to thank my colleague Dr. Kimberly Speers, for drawing FORT-VI's request to my attention, and Alli Cano, who agreed to work on the companion report as part of the requirements for her MPA, which engaged in community consultations on the project. Alli produced an outstanding report.

The University of Victoria encourages faculty and students to engage with community research initiatives such as this and prides itself for such efforts. FORT-VI's proposal and involvement with the research contributed to an important aspect the University's strategic objectives.

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Executive Summary

Introduction

The research described in this report was conducted on behalf of Friends of Rails-to-Trails – Vancouver Island (FORT-VI). FORT-VI was interested in engaging with faculty and students at the University of Victoria’s School of Public Administration in an effort to produce an economic evaluation of their proposal to convert the segments of the E & N Rail Corridor North of Langford to a non-motorized multi-use trail. This report is one of two reports produced on this issue. This report consists of a contingent valuation (economic evaluation) of the benefits of the trail. The companion report is based on a community consultation regarding the project, supported by an extensive literature review of trail and rail-to-trail research.

Methodology

The methodology used for this research is referred to as ‘contingent valuation’. Contingent valuation uses surveys to solicit information from respondents who might be expected to benefit and pay for a project via taxes or other methods. The survey collects a variety of information about respondents regarding their general attitudes and behaviour as related to the project, demographics, and their willingness to pay for the project. Answers to willingness-to-pay (WTP) questions are used to derive an estimated stakeholder aggregate WTP for the project, which is regarded as the estimated social value of the project. Contingent valuation methodology is commonly used by economists to estimate social value for projects or goods or services that do not have market values. This approach is common in environmental economics and for public finance applications. The report analyzes the results of WTP questions and estimates aggregate WTP using corrections to account for the fact that the survey sample is not a representative sample of the underlying population of interest.

Survey responses used in the report were collected between May 15, 2019 and December 7, 2019.

Findings

A total of 806 survey responses were received, most of which (802) were usable. Most respondents were from Vancouver Island (86%), with 7.6% from BC outside of VI and 6.6% outside of BC. Most respondents are trail users (98%) and most VI respondents (74%) reside less than 5 kilometers from the trail. Trail users prefer trails to sidewalks and roads because they can be in a quieter, more natural environment (90%), because they are safer (80%) and have better air quality (67%). They primarily use trails to cycle and walk (87%), both examples of active transportation, a form of transportation promoted by the BC Government. The availability of high quality long-distance trails are important to their travel plans. Most respondents (86%) do or would use developed sections of the corridor if they were nearby. Only 4% of non-VI respondents attach little or no importance to the availability of high quality trails in deciding to visit VI and 52% (13.5%) of VI visitors reported spending \$100 (\$400) or more on food, accommodation, and other spending while visiting.

BC respondents were older, more educated, and had higher incomes than the BC population average. These respondents were used to estimate BC and VI aggregate WTP for the proposal. Aggregate VI WTP for the proposal was estimated at a recurring \$18.3 million per year (or \$366 million over a 20-year period). This aggregate was based on sample WTP adjusted in three ways: first, the sample WTPs were stratified by age and education and actual population distribution weights were used to adjust the amounts to be more reflective of the underlying population; second, WTP estimates were derived for both BC and VI as the respondents from BC

were a small proportion of the total – hence the \$18.3 and \$366 million reported above are for VI respondents only; and third, the estimates were halved (from \$36.7 million annually) to reflect the finding that half of BC respondents reported using active transportation in a recent representative survey.

The WTP findings, survey responses, BC Government policy statements, the nature of trails as public goods with positive externalities and their potential to support the tourism industry suggest that this project should be seriously considered as an expenditure to be financed by the BC Government out of general revenues.

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Introduction

Friends of Rails to Trails (FORT-VI) President, Alastair Craighead, and Secretary-Treasurer, Wilfrid Worland contacted the University of Victoria's School of Public Administration in 2018, to solicit assistance from one or more of its graduate students and faculty, to develop a report that would seek to demonstrate the value of FORT-VI's proposal "[t]o convert the existing rails within the Vancouver Island Corridor north of Langford into a non-motorized*, multi-use community trail" (FORT-VI, 2020). Alli Cano, a graduate student, and Lynda Gagné, a faculty member, agreed to undertake this research with Ms. Cano focussing on community consultations and its associated MPA capstone report, under the supervision of Dr. Gagné, and Dr. Gagné focussing on an economic evaluation of FORT-VI's proposal. Ms. Cano's report "Community consultations for a non-motorized, multi-use community trail along the Vancouver Island Corridor" was completed and defended in November 2019.

This companion report is the economic evaluation, which was conducted using what is referred to as the contingent valuation approach. This approach to economic evaluation is commonly used to estimate the social value of goods and services without a market price, ranging from ecosystem services, parks, environmental restoration, and is most commonly used in environmental economics. The approach consists of eliciting members of society's willingness-to-pay for an environmental or other public investment proposal through survey means (Alberini & Kahn, 2006). The social values thus estimated can form the basis for government to decide whether (if estimated social benefits exceed estimated costs) and how much (to what extent, if quality and scale are part of the analysis) to fund such goods and services. This report discusses how the contingent valuation approach was implemented in more details, the other results of the survey, and reports social value estimates (aggregate willingness-to-pay for BC as a whole and Vancouver Island only), while taking into account the policy context.

The remainder of this report is organized as follows. The Background section provides an overview of the context of this research. The Methodology and Limitations section explains how the survey was developed, respondents recruited, and limitations of the survey. The Survey sections describes the results of the survey and is organized in multiple subsections. The Discussion section elaborates on the findings in a public policy context. The Conclusion section is a brief summary of the research.

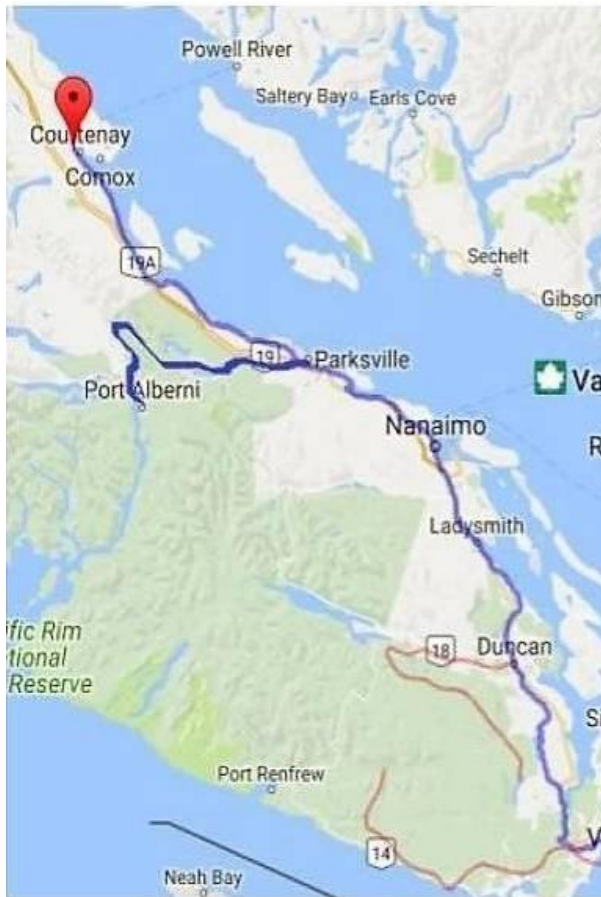
Background

This section describes the corridor, and discusses FORT-VI's and the Island Corridor Foundation's proposed uses for corridor, past research on the corridor, and potential benefits of the FORT-VI proposal; recent efforts by the BC Government to explore the restoration of rail service; and the BC Government's recent actions and policy statements around active transportation and trail policy.

The Vancouver Island Corridor and FORT-VI's Proposal and Related Research

The Vancouver Island Corridor (VIC), also referred to as the Esquimalt and Nanaimo (E&N) Railway Corridor, consists of two main branches: the Victoria subdivision, extending 224 km from Victoria to Courtenay, and the Port Alberni subdivision, extending 64 km from Parkville to Port Alberni (IBI Group) (2010, p. 9). Construction of the railway and corridor began in 1884. The corridor was built to "support the coal and lumber industry and the Royal Navy Base at Esquimalt Harbour" (Canadian Railroad Historical Association, Esquimalt & Nanaimo Division,

2018) (para. 3) and has also been used for passenger service. Passenger service on the corridor was terminated in March 2011 for safety reasons, while freight service dwindled over the years, although limited freight service still occurs along some segments of the corridor (paras. 8 & 11). Figure 1 illustrates the corridor.



Coastal Corridor

Victoria to Courtenay 224 km

Vic West – Langford – Malahat - Shawnigan
 Lake - Cobble Hill - Cowichan - Duncan – Ladysmith
 – Cassidy - Nanaimo – Lantzville – Nanoose –
 Parksville - Qualicum Beach -Bowser/Deep Bay –
 Fanny Bay/Union Bay – Royston – Courtenay

Inlet Branch Corridor

Parksville to Pt. Alberni 64 km

Parksville - Coombs – Little Qualicum Falls –
 Cameron Lake – “Cathedral Grove” – Loon
 Lake - Mount Arrowsmith Ridge – McLean Mill
 Historic Park – Port Alberni/Alberni inlet

Completed Rail-Trails

Lochside/Galloping Goose 80 km

Shawnigan/Lake Cowichan/Duncan 75 km

Figure 1. Courtesy of FORT-VI

The corridor covers 650 hectares, and runs through or is adjacent to five regional districts (RD)¹, 14 municipalities² and 13 First Nations³ (IBI Group, 2010, pp. 8-9) a. It is owned by the Island Corridor Foundation (ICF), a non-profit charitable organization established in 2003 to own and manage the corridor (Island Corridor Foundation, n.d.), which is overseen by a board of directors composed of five directors from First Nations, five from regional districts and two at-

¹ Capital RD, Cowichan Valley RD, Nanaimo RD, Alberni-Clayoquot RD (Port Alberni subdivision), and Comox Valley RD.

² Victoria, Esquimalt, View Royal, Langford, Duncan, North Cowichan, Ladysmith, Nanaimo, Lantzville, Parksville, Port-Alberni, Qualicum Beach, Comox, and Courtenay.

³ Songhees, Esquimalt, Malahat, Cowichan, Halalt, Lake Cowichan, Chemainus, Snuneymuxw, Snaw-Naw-As, Tseshah, Qualicum, Hupacasath, and Comox.

large. The corridor, previously owned by CPR and RailAmerica was donated to the ICF (Island Corridor Foundation, n.d.).

Two basic potential uses are under consideration for the corridor: an uninterrupted active transportation corridor (FORT-VI proposal) or rail service with some adjacent trails (ICF proposal). Although the ICF has been actively trying to get rail service along the corridor restored since it was terminated, these efforts have been unsuccessful to date and rail service restoration may never be economically or technically wise or feasible. Meanwhile, FORT-VI and others have been advocating for the replacement of the corridor's rail beds along the sections of the corridor north of Langford with an active transportation corridor: a non-motorized⁴, multi-use community trail, allowing Vancouver Island residents and tourists to enjoy an uninterrupted active transportation corridor along the east side of Vancouver Island all the way to Courtenay and from Parksville to Port-Alberni. This corridor would connect to the Duncan-Lake Cowichan-Shawnigan Lake Trail and the Galloping Goose Trail.

While a study was conducted for the ICF in 2010 to identify potential rail development strategies for the corridor and their costs (IBI Group, 2010), no study has yet been done on the feasibility or the capital and operating costs of transforming the corridor into an active transportation corridor, although many such transformations have occurred in Canada and the United States, which could provide some insight on the typical costs of such transformations.

The potential benefits of an uninterrupted trail along the corridor are many. Many residents of Vancouver Island walk to work or commute by bicycle for health, sport, and/or because of their concern over climate change. However, aside from most of the CRD where there are many well-developed active transportation corridors, the same is not true for communities north of Langford. Hence, cyclists in particular are at risk when traveling busy roads commuting from one community to another. The low income are especially vulnerable. Some cannot afford a motor vehicle, their main mode of transportation is walking or cycling, and they are frequently walking or cycling on busy and unsafe roads. An uninterrupted trail would provide countless residents along the corridor with a low cost and safe commuting option. Moreover, a continuous trail along the corridor would be an important tourist attraction and also encourage Vancouver Island residents to favour local holidays over travel out of Vancouver Island. FORT-VI (FORT-VI, 2020) summarizes benefits to locals and how the trail could serve as a tourist attraction:

- Locals can utilize the trails for local commuting or pleasure while avoiding the hazards, congestion and noise of the road.
- Cyclists can travel between local communities for shopping, work or pleasure.
- Walkers and hikers could pick up the trails at any location for a peaceful outing.
- The trails could be a drawing card for national and international tourists as the trails would link communities up and down Vancouver Island.
- Existing train stations could be made into information booths giving directions to local attractions and accommodations.

Rail Service Restoration Efforts and Studies

As noted in the previous section, ICF has been actively trying to get rail service along the corridor restored. A study was conducted for the ICF in 2010 to identify potential rail

⁴ Including e-bikes.

development strategies for the corridor and their costs. In fact two studies conducted by the IBI Group, and funded by the B.C. Government Ministry of Transportation & Infrastructure, on behalf of ICF were completed. One study consisted of an (economic) evaluation (IBI Group, 2010), while the other focussed on development strategies for ICF (IBI Group, 2010). Both of these studies were completed before passenger service on the corridor was terminated in March 2011. In addition to these studies, E & N bridge assessment reports (Government of British Columbia, n.d.) were completed in 2012. While the economic study estimates shed some doubt on the economic viability of rail service restoration on the VIC, the IBI and bridge assessment studies are now dated and not reviewed here.

Following pressure from the ICF and local governments to restore passenger rail service, and as a result of significant challenges⁵ that the Malahat drive linking the South Island to northern parts poses, the BC Government announced in 2019 that it would:

- 1) Conduct a condition assessment study of the E & N Railway Corridor. The request for proposal (RFP) for this study states: “The purpose of this RFP is to invite Proposals from Proponents, to provide engineering services to undertake a detailed evaluation of the base asset condition of the E&N Railway of Vancouver Island. The assessment will include the entire length of the E & N corridor, Victoria to Courtney as well as developing a cost estimate to re-establish the Port Alberni line. The assessment may be used to evaluate future use options for the corridor.” (Government of British Columbia, 2019) p. 4. According to P. Webber (personal communication, March 5, 2020) of the Ministry of Transportation and Infrastructure (MOTI) “This will include railway infrastructure, grade crossings, bridges and rockfall activity as well as the costs to upgrade infrastructure to resume normal rail freight and passenger service.”
- 2) Conduct a South Island Transportation plan. According to MOTI, this plan, which will rely on a commissioned study “will look to identify improvement options for transit, cycling, pedestrian movements, ferry services, rail and existing roads and the connections between them. The study area will go as far north as the Duncan area and as far west as the Sooke area. It will look at current transportation demands and develop a roadmap for future investments across all modes of travel.” (Government of British Columbia, n.d.)

According to R. Mounteney (personal communication with Denise Savoie) and P. Webber (personal communication), the assessment study results and plan are expected to be available in the spring of 2020.

Given the doubtful economic viability of rail service restoration revealed by the 2010 research, the further deterioration of the corridor, which would likely adversely affect rail service restoration more than trail development, and the much lower costs of bus transportation to northern island communities (Litman, 2019), a good case can be made for the rail-to-trail option. However, challenges to the rail-to-trail option compared to the rail restoration option do exist and include the political push by Island local government and individuals for rail service restoration, and the fact that while buses may be a far more economical (and climate-friendly) approach to reducing congestion than passenger rail service restoration, they do not resolve the

⁵ A serious accident on the Malahat drive can bring traffic between north and south to a halt for several hours. The only alternative is a detour via Pacific Marine Road, and Highway 18 through Sooke and Cowichan Lake, a less than desirable alternative as sections of the Pacific Marine Road are very rugged and cannot handle much traffic.

issue of long traffic delays and highway closure resulting from highway accidents. It is unclear however that rail service restoration is a viable solution to this problem as it is doubtful that passenger and freight rail service would have the capacity to replace the highway in an emergency.

Additional important challenges to both rail service restoration and rail-to-trail development revolve around First Nation title on the corridor. Discussion of this issue is beyond the scope of this report and is addressed in the companion report by Cano (Cano, 2019).

[BC Government Active Transportation Strategy and Trail Strategy and Consultation](#)

[BC Government Active Transportation Strategy](#)

In June 2019, the BC Government published an active transportation strategy document (Government of British Columbia, 2019). The document identifies the following strategic objectives (p. 5):

- Double the percentage of trips taken with active transportation by 2030.
- Inspire British Columbians of all ages and abilities to choose active transportation with incentives that encourage active transportation use—like the Scrap-It e-bike rebate, Learn to Ride programs and Active and Safe Routes to School.
- Build on the success of the BikeBC program, so communities can build integrated and accessible active transportation systems that work for all active transportation users.
- Work together with communities to create policies and plans that enable and support complete active transportation networks across the province.

The document also identifies the following strategies for the next year (p. 5):

- Review the Motor Vehicle Act to address the definition of road users to include emerging active transportation modes, such as electric bikes, scooters and skateboards.
- Work with ICBC to further develop education content that includes the rights and responsibilities for all road users. This will increase safety and reduce serious injuries.
- Provide cost share funding to communities to help build and complete safe active transportation networks and connections by expanding the existing Provincial grant program to include all forms of active transportation.
- Publish, promote and implement an Active Transportation Design Guide for cross-government consistency—making it easier for communities to incorporate active transportation into their infrastructure planning.

Noting that the cover page on this report is a photo of a cyclist loading her bike on a BC Transit bus, and the third objective and the third strategy on the lists above, one is led to believe that the BC Government is committed to integrate trail and public transit infrastructure. Such a commitment is consistent with FORT-VI's proposal and would suggest that a great deal of thought and planning should be devoted to the integration of the proposed trail to public transit if the FORT-VI proposal is adopted. Litman's (2019) proposal to expand public transit from the South Island to the North Island as a way of dealing with Malahat congestion is also consistent with this commitment.

[BC Government Trail Strategy and Consultation](#)

The B.C. Government published a trail strategy in 2012 (Government of British Columbia, 2012). The document (p. 18) provides the following overview of the strategy:

Vision

A world-renowned, sustainable network of trails, with opportunities for all, which provides benefits for trails users, communities and the province.

Guiding Principles for a World Class System of Trails

- Sound Environmental Stewardship and Management
- Respect and Recognition for First Nations' Interests
- Mutual Respect amongst Trail interests, Other Resource Users and Existing Tenure Holders.
- Respect and Understanding among Diverse Trail Interests
- Partnerships and Collaboration
- Secure Recreation Opportunities for All Trail Users
- Benefits for Individuals, Communities and the Province

The FORT-VI proposal could certainly contribute to the above-stated vision. Given that the trail strategy document is somewhat dated, the BC Government recently undertook a trail strategy review, which included consulting with British Columbians: “[b]etween January 13 to February 28, 2020, British Columbians were invited to share their stories and experiences on B.C. trails, as well as provide feedback to help inform changes and updates to the Trails Strategy for B.C.” (Government of British Columbia, 2020). The now closed consultation included a survey of British Columbians about their trail use and preferences. Several of the questions in that survey were comparable to the survey conducted for FORT-VI⁶. However, an important difference between the two is that while the BC Government survey sought to elicit respondents’ willingness-to-pay for trails via user fees, the FORT-VI survey recognized that the nature of trails is such that the best financing vehicle for them is through general revenues raised from taxes.

There are two types of economic arguments that lead to the conclusion that trails are best financed via general revenues (taxes) rather than via user fees. The first is efficiency and the second is equity. The efficiency reason is that trails exhibit characteristics of a *public good* (distinct from a publicly financed good or service). A public good has two basic characteristics: it is non-excludable and non-rival. A non-excludable good is such that preventing people from using it (without paying) is difficult. Clearly, preventing people from using trails without paying could be extraordinarily difficult or prohibitively expensive. But the ability to prevent people from using a good without paying is necessary to succeed in collecting user fees. While reasonable (affordable in light of expected revenues) technology is available to implement user fees on highways and bridges via camera equipment and related technology, the same cannot be said for trails. A non-rival good is such that one person’s use of the good does not detract from another person’s. Congestion and other issues (e.g., disrespectful users) may erode that characteristic in trails, but one can argue that if the demand for trails is such that congestion is occurring, it may be time to develop more trails as trails also exhibit what is called positive externalities, an efficiency argument that supports their subsidization. As discussed above and in Cano (2019), trails have a number of benefits other than their simple enjoyment: they can reduce carbon emissions, promote health, and thus reduce pressures on public health care

⁶ Dr. Gagné completed the survey on February 28, although the survey questionnaire was not downloadable and the discussion in this report is based on recall.

systems, increase social cohesiveness, reduce cyclist or pedestrian accidents and fatalities, and so on. These are considered positive externalities. Economic theory posits that to increase economic efficiency, public goods should be entirely financed with government revenues and that goods with positive externalities should be subsidized. Such an approach will promote the most efficient allocation of resources, although some measure of the value to users of the good or service needs to be derived to arrive at the right level of financing / subsidization and scale. The method of estimation of social value or taxpayers' willingness-to-pay for a public good used in the survey conducted for FORT-VI is a common approach used by economists to arrive at such valuations.

The equity side of the economic argument is simple: low income individuals and families can least afford to pay user fees. User fees treat trails as private goods such as cars, air travel, and luxuries, and discourage those who might benefit the most from their use from using them. Hence, the already disadvantaged are further disadvantaged by user fees. And clearly, income-testing trail user fees to address this issue would be as extraordinarily difficult as preventing people from using trails without paying. Hence, the use of user fees to finance BC trails is not recommended.

The BC Government survey also asked respondents if they were willing to voluntarily contribute (i.e., donations) to trails. Unfortunately, if public services (and public goods) were dependent on donations, the government would fail to provide an economically efficient level of public services because of the "free-rider" problem⁷, certainly an apt expression in this context.

Finally, the BC Government asked respondents if they were willing to pay for trails via a tax on sporting goods, such as bicycles and helmets, etc. Such an approach is not economically efficient as not all persons who buy bicycles and helmets use trails. It also suffers from the equity problem, discouraging the disadvantaged from purchasing sporting goods. Moreover, such an approach would undoubtedly be a political albatross for the government.

To conclude, general taxation is the most economically efficient, equitable, and politically expedient vehicle for financing the development and maintenance of trails.

Methodology and Limitations

The survey questionnaire was designed using methodology principles commonly recommended for contingent valuation. First, related literature was reviewed to for specific approached used in contingent valuation and to examine survey designs used by other researchers of trails or related amenities. Second, the survey was designed to include the sections recommended for contingent valuation studies, including: 1) attitudinal questions related to the topic area (importance of trails to respondent), 2) behavioural questions related to the topic area (types of use or tails and frequency of use), 3) demographic questions to examine how different population subgroups respond to other questions and for this particular study, to adjust the weight of willingness-to-pay responses to better reflect the underlying population should the sample not be representative of the overall population along these dimensions, and 4) willingness-to-pay questions. Whitehead in Alberini and Kahn, Eds. (2006) outlines these usual

⁷ Free-riding occurs when some of those who use a donation-financed good or service fail to donate a sufficient amount, relying on other people's donations to finance the good or service. Economic theory posits that donation-based systems will fail to yield (undersupply) the socially optimum good or service level.

sections of willingness-to-pay questionnaires. In addition, a section was developed for visitors to Vancouver Island, from other part of BC and the rest of the world, to get an idea of how much such visitors spend while visiting the Island and compare findings to BC tourism objectives and to the literature on the travel cost method⁸.

The underlying survey population was BC residents aged 18 years or more for willingness-to-pay questions, these residents plus visitors to Vancouver Island for general trail use and preference questions, and BC and non-BC visitors to Vancouver Island for travel frequency and spending questions. Ideally, BC survey participants should have been randomly selected to participate so as to reflect the underlying population and produce unbiased results⁹. However, obtaining a random sample of the population is expensive as it typically involves calling a random sample of people using published phone numbers. No funds were available to implement such an approach, and this lack of randomization is the most significant limitation of this survey. Nevertheless, telephone surveys are becoming less representative as fewer telephone numbers are published and many individuals screen their calls. Finally, methods are available to complement the less expensive although biased method used to recruit survey participants. These methods include stratifying and weighting the sample to better reflect the underlying population and other adjustments, by comparing sample results to representative surveys. These methods are implemented and discussed in the section of this report that aggregates willingness-to-pay (WTP) for the project (a subsection of the Survey Results section), which is an estimate of its social value and of what government should be willing to invest in it, as society's representatives, tax collectors, and social project implementers. This research does not in any way estimate the cost of converting the rail corridor to a trail corridor. Such an estimate would require engineering studies. However, the results presented here could be combined with such estimates (prepared by others) to develop a cost-benefit analysis of the project by comparing estimated social benefits to the estimated development and maintenance costs. The estimated social value for this project is presented in annualized 2019 prices and a comparison with estimated costs would have to either present costs in the same way or adjust benefits so that costs and benefits (social value) use the same unit of value (annualized and expressed in a particular year's prices or discounted to a common year) and are comparable.

Three consecutive willingness-to-pay questions were developed, with a maximum range of \$50, a starting offer of \$20, \$30, \$40, or \$50, randomly assigned by the software (Survey Monkey) and subsequent offers depending on respondents' answers to previous questions. More details about the logic of the sequence of questions and answers, together with their distribution is provided in the Survey Results section.

A draft survey questionnaire was circulated to FORT-VI members of the Board of Directors for feedback and questions were adjusted to reflect the received feedback, which was very useful, especially given that FORT-VI members are regular trail users. The research protocol (sample questionnaire, recruitment approach, degree of confidentiality and anonymity) received approval from the University of Victoria's Human Research Ethics Board.

⁸ The travel cost method is another method used to estimate the social value of an amenity by focussing on how much travelers who use the amenity spend to get to it, including the value of their time to get there.

⁹ Non-BC residents could not possibly be sampled randomly, unless a definite underlying population with accessible contact information was identified.

The survey was disseminated using the following means: posters, online newspaper pop-up ads distributed through the Times Colonist (mainly Vancouver Island readers) and Postmedia (BC as a whole), letters to nature and cycling community groups asking them to circulate our recruitment letter to their membership list, FORT-VI website and membership, and word-of-mouth that would naturally follow as a result of these various methods.

The 2019 *Contingent valuation of the benefits of a non-motorized, multi-use community trail along the Vancouver Island Corridor north of Langford* survey was launched on May 15, 2019. As of December 9, 2019, a total 806 individuals had responded to the survey. The results reported here are based on these responses.

Survey Results

This section of the report presents survey results. Most results (largely trail use and preferences and some travel information for non Vancouver Island residents) are presented without stratification and hence are a simple reflection of respondents. The willingness-to-pay (WTP, social value estimates) are weighted stratifying on age and education. Demographic responses for BC residents are compared to BC population data and other survey data that originates from earlier years (2018 BC Populations Statistics, 2016 Canadian Census, and 2015-2016 Canadian Community Health Survey). These comparisons are used to discuss the representativeness of the sample and others to adjust findings to be more reflective of the underlying population.

As noted earlier, the survey was directed at respondents aged 18 years of age and over: a screening question based on age, which was asked at the very beginning of the survey, led individuals answering that they were less than 18 years of age out of the survey.

The survey was designed so that certain groups of questions only applied to certain profiles. In particular, trail use questions only applied to trail users or potential trail users, willingness-to-pay questions only applied to British Columbia (BC) residents, and travel cost questions only applied to non-Vancouver Island (VI) residents. In addition to these survey design exclusions, some trail users did not answer all of the trail use questions, and some respondents did not answer all of the questions associated with their residence. For example:

- While 806 individuals started the survey, only 802 responded to the usual residence question.
- While 688 respondents indicated they reside on VI, 683 indicated which regional district they reside in and how far they reside from nearest segment of the E & N corridor.
- While 806 individuals started the survey, 797 answered the question on whether they use trails or would use a trail if one was nearby. And of the 779 who responded that they would, only 756 indicated how important trails are to them.

In the results that are presented below, the wording of the survey question is used in the figure's title.

Residence and Proximity to Corridor

Survey respondents were asked about their residence. Table 1 shows that most survey respondents were from VI (85.8%), with 7.6% from BC, outside of VI and 6.6% from outside of BC.

Table 1 – Where is your usual residence?

ANSWER CHOICES	RESPONSES	
Vancouver Island	85.79%	688
British Columbia, outside of Vancouver Island	7.61%	61
Outside of British Columbia	6.61%	53
TOTAL		802

VI respondents were asked which regional district (RD) they reside in. Table 2 shows that of those who answered this question (683 of the 688 VI respondents), 36.5% of respondents were from the Comox Valley RD, 28% from the Capital RD, 26.4% from the Nanaimo RD, 5.7% from the Cowichan Valley RD, and less than 4% from the remaining three RDs.¹⁰

Table 2 – Which of the following Vancouver Island Regional Districts do you reside in?

ANSWER CHOICES	RESPONSES	
Capital Regional District	27.96%	191
Cowichan Valley Regional District	5.71%	39
Nanaimo Regional District	26.35%	180
Alberni-Clayoquot Regional District	1.32%	9
Comox Valley Regional District	36.60%	250
Strathcona Regional District	1.90%	13
Regional District of Mount Waddington	0.15%	1
TOTAL		683

The survey respondent distribution across VI RDs shown in Table 2 above differs significantly from BC Government VI population estimates for 2019, as shown in Table 3 below. The most significant differences are for Capital (CRD), which is underrepresented in the survey, with 28% of respondents compared to 49.8% in population estimates, and for the Comox Valley RD, with 36.6% of respondents compared to 8.5% in population estimates. The only other over-represented RD in the survey is Nanaimo, with 26.4% of survey respondents compared to 20.2% in population estimates. The over-representation could possibly be explained by relative lack of trail development in the Comox Valley and Nanaimo areas in comparison to the Capital RD. In addition, since much of the survey recruitment was conducted by volunteers and word of mouth,

¹⁰ The Central Coast and Powell River RDs were omitted from the list.

there may well have been a greater recruitment effort relative to the population in the Comox Valley and Nanaimo areas.

Table 3 – Survey vs Population Representation on Vancouver Island

Regional District	Survey	BC Population Estimates, 18+
Capital	28.0%	49.8%
Cowichan Valley	5.7%	10.6%
Nanaimo	26.4%	20.2%
Alberni-Clayoquot	1.3%	3.9%
Comox Valley	36.6%	8.5%
Strathcona	1.9%	5.7%
Mount Waddington	0.2%	1.3%
Total	100%	100%

[*Calculated from: Government of British Columbia, Population Estimates Application](#)

Survey respondents were also asked how close they reside from the nearest segment of the VI Corridor. Table 4 shows that the majority (59.3%) of respondents reside less than three kilometers and that 74.4% reside less than five kilometers from the nearest segment of the trail.

Table 4 – Approximately how far do you reside from the nearest segment of the Vancouver Island Corridor (E&N Rail Corridor)?

ANSWER CHOICES	RESPONSES	
Less than 1 kilometer	35.58%	243
1 to less than 3 kilometers	23.72%	162
3 to less than 5 kilometers	15.08%	103
5 to less than 10 kilometers	14.06%	96
10 to less than 20 kilometers	4.98%	34
20 kilometers or more	3.07%	21
Don't know	3.51%	24
TOTAL		683

Demographics

Survey respondents were asked a series of demographic questions to ascertain how representative they are of the British Columbia and Vancouver Island population. The first of these questions asked them for their sex and was worded identically to the Census 2016

question, although the distribution comparison that follows the Table 5 below is based on the more updated 2018 BC Statistics data.

Table 5 – What is your sex?

ANSWER CHOICES	RESPONSES	
Male	45.47%	346
Female	54.53%	415
TOTAL		761

According to BC Statistics data for 2018, males represented 49.1% and 49.0% of the BC and VI population 18 and over, respectively. While females are over-represented in the survey, the difference is not large.

Respondents were then asked about their age, the results of which are presented in Table 6.

Table 6 – What is your age?

ANSWER CHOICES	RESPONSES	
18-24	1.18%	9
25-34	6.83%	52
35-44	11.83%	90
45-54	13.93%	106
55-64	31.27%	238
65+	34.95%	266
TOTAL		761

Table 7 shows that older age groups are over-represented in the survey, with 66% of survey respondents aged 55 and over, compared to population estimates of 47% on VI and 40% in BC. Older individuals may be more engaged in recreation activities than younger singles and parents, with the latter assuming considerable work and family responsibilities.

Table 7 – Age Distribution, Survey Respondents and BC and VI Residents (2018)

Age Group	Survey	BC 2018*	VI 2018*
18-24	1.2%	10.9%	9.2%
25-34	6.8%	17.1%	14.4%
35-44	11.8%	15.7%	14.1%
45-54	13.9%	16.7%	15.2%
55-64	31.3%	17.5%	19.1%
65+	35.0%	22.2%	28.0%
Total	100%	100%	100%

**Calculated from: [Government of British Columbia, Population Estimates Application](#)*

Respondents were then asked about their education level. The majority (59.4%) reported having a university degree and 85.7% reported having post-secondary credentials.

Table 8 – What is the highest level of education you have completed?

ANSWER CHOICES	RESPONSES
High school diploma or less, including some college or university, without certificate, diploma, or degree	14.32% 109
College or university certificate or diploma	26.28% 200
University degree (bachelor's, master's, or doctorate)	59.40% 452
TOTAL	761

As with age and sex, the education distribution for survey respondents is compared to population estimates. Survey respondents are far more educated than the BC average based on 2016 Census data, with 59.4% reporting a university degree compared to 25.4% for the BC population. The education differential is concentrated at the top and bottom of the education scale, with college and university certificate or diploma representation being equal between the survey and population estimates. The educational differential can certainly be partially explained by the age differential, since university degrees are not typically acquired until later in life and only 1% of survey respondents are between 18 and 24 compared to the BC population estimates of 11% and VI population average of 9%. It may also reflect a correlation between trail use and socioeconomic advantage.

Table 9 – Education Distribution, Survey Respondents and BC Residents (2016)

Education	Survey	BC Population Estimates, 18+, 2016*
High school diploma or less, including some college or university, without certificate, diploma or degree	14.3%	48.3%
College or university certificate or diploma	26.3%	26.2%
University degree (bachelor's, master's, or doctorate)	59.4%	25.4%
Total	100%	100%

*Calculated from: 2.7% sample of 2016 Census of Canada, BC subpopulation, 18+

The last demographic question asked respondents about their 2018 personal before tax annual income.

Table 10 - What was your 2018 personal (not household) before tax annual income? Please include both market income and government transfers.

ANSWER CHOICES	RESPONSES	
Under \$15,000	3.81%	29
Between \$15,000 and \$29,999	9.86%	75
Between \$30,000 and \$49,999	22.21%	169
Between \$50,000 and \$74,999	25.62%	195
Between \$75,000 and \$99,999	19.84%	151
Between \$100,000 and \$150,000	12.09%	92
Over \$150,000	6.57%	50
TOTAL		761

As with other demographic variables, the income distribution for survey respondents is compared to population estimates. As can be seen from the table below, survey respondents have far higher incomes than the BC average for the same underlying population, using income for 2015, as reported in the 2016 Census, as a comparator. While 64.1% of survey respondents reported a 2018 income of \$50,000 or more, 33.2% of BC residents (over 18) reported this level of income for 2015. The income differential is consistent with the age and education differentials, as average incomes increase with age until retirement and increase with education. It also likely reflect a correlation between trail use and socioeconomic advantage, although, as noted earlier, there may be reasons other than interest in trails that would account for a lower response rate in younger, less well-off, and less educated groups. In addition, average incomes may have increased somewhat between 2015 and 2018, although such an increase should only account for a small part of the differential.

Table 11 – Income Distribution, Survey Respondents and BC Residents (2015)

Income	Survey	BC Population Estimates, 18+*, 2015
Under \$15,000	3.8%	22.1%
Between \$15,000 and \$29,999	9.9%	22.9%
Between \$30,000 and \$49,999	22.2%	21.8%
Between \$50,000 and \$74,000	25.6%	16.5%
Between \$75,000 and \$99,999	19.8%	8.6%
Between \$100,000 and \$150,000	12.1%	5.3%
Over \$150,000	6.6%	2.8%
Total	100%	100%

*Calculated from: 2.7% sample of 2016 Census of Canada, BC subpopulation, 18+
Census 2016 incomes are 2015 incomes.

While demographic differentials between survey respondents and the underlying BC populations may give cause for concern over willingness-to-pay estimates, the BC population distribution and representative survey data from the 2015-16 Canadian Community Health Survey are used later in the report to determine the potential degree of interest in trails in the BC Population and to adjust willingness-to-pay estimates to better reflect the underlying population.

General Trail Use and Trail Users Habits and Preferences

Respondents were asked if they do or would use nearby trails. Of the 797 respondents to this question, 98% (779) indicated they would. Those who responded yes were asked a series of questions about their trail use and preferences.¹¹ The first of these asked respondents how important trails are to them. Over 90% responded that they are important or extremely important and less than 1% indicated that they are not important.

Table 12 – Which of the following best describes the importance or potential importance of trails (if available) to you given your actual or desired lifestyle?

ANSWER CHOICES	RESPONSES	
Extremely important	60.45%	457
Very important	30.29%	229
Somewhat important	8.33%	63
Not so important	0.79%	6
Not at all important	0.13%	1
TOTAL		756

Trail users were then asked when, during a week, they are most likely to use a trail. An overwhelming majority (87%) responded that they do or would use trails both on weekdays and week-ends.

Table 13 – When do you or would you most likely use a nearby trail?

ANSWER CHOICES	RESPONSES	
Weekdays	5.68%	43
Weekends	7.00%	53
Both	87.32%	661
TOTAL		757

¹¹ In the remainder of this discussion, the expression “trail users” includes both actual trail users and those who would use a trail should one be nearby, reflecting the semi-hypothetical nature of the screening trail use question, *Do you use trails or would you use trails if one or more were nearby?*

Trail users were then asked what activities they engaged in on trails. The vast majority of respondents identified walking/hiking (86.8%) and cycling (87.3%), with walking a pet a far third in the list at 36.0%.

Table 14 – What activities do you or would engage in on a nearby trail? Check all that apply.

ANSWER CHOICES	RESPONSES	
Walking/hiking	86.81%	658
Cycling (including e-bikes)	87.34%	662
Riding e-scooter	1.98%	15
Jogging/running	28.63%	217
Horseback riding	3.69%	28
Roller blading	3.56%	27
Walking pet	36.02%	273
Skiing/snowshoeing	18.87%	143
Other	2.77%	21
Total Respondents: 758		

Trail users were also asked what would cause them to favour a trail over a sidewalk or street. Being in a quieter or more natural environment were the favoured reasons with 90.4% choosing these reasons. The next most frequent reasons were safety (80.2%), better air quality (67.4%) and watching birds and wildlife (64.9%).

Table 15 – If the activity you engage in on a trail could be conducted on a sidewalk or street, which of the following reasons would cause you to opt for a trail instead? Choose all that apply.

ANSWER CHOICES	RESPONSES	
I believe that trails are safer.	80.18%	607
Air quality is far better on a trail.	67.37%	510
I can be in a quieter environment.	90.36%	684
I can meet other trail users.	34.61%	262
I can be in a more natural environment.	90.36%	684
I can watch birds and other wildlife.	64.86%	491
I can pick wild berries or otherwise forage.	37.25%	282
Total Respondents: 757		

Next, trail users were asked how frequently they do or would use a trail in fair weather. Over 90% responded once per week or more.

Table 16 - In the summer or in relatively fair weather, how frequently do you expect you would use a nearby trail?

ANSWER CHOICES	RESPONSES	
Every day	25.79%	196
A few times a week	52.50%	399
About once a week	12.11%	92
A few times a month	6.84%	52
Once a month	1.58%	12
Less than once a month	1.18%	9
TOTAL		760

Trail users were then asked the same question again, but this time, in not-so-fair weather. Expected weekly usage dropped from 90% to 74% and expected daily usage from 25.8% to 10.5%.

Table 17 – In the winter or in relatively unfavourable weather, how frequently do you expect you would use a nearby trail?

ANSWER CHOICES	RESPONSES	
Every day	10.54%	80
A few times a week	44.53%	338
About once a week	18.97%	144
A few times a month	13.83%	105
Once a month	5.27%	40
Less than once a month	6.85%	52
TOTAL		759

Trail users were then asked how long they do or would normally spend on a trail. Most respondents (>96%) expect to spend more than 30 minutes and 20% more than two hours.

Table 18 - On average, how much time do you or would you usually spend on a nearby trail?

ANSWER CHOICES	RESPONSES	
Less than 30 minutes	3.56%	27
30 minutes to 1 hour	36.68%	278
1 to 2 hours	39.84%	302
More than 2 hours	19.92%	151
TOTAL		758

Trail users were then asked about the importance of trails in their travel plans. Almost 86% of respondents answered that the presence of a high quality long-distance trail is likely or very likely to factor into their travel plans. This highlights the importance of high quality trails to tourism.

Table 19 – How likely is the presence of a high quality long-distance hiking/cycling trail at your destination to factor into your travel plans?

ANSWER CHOICES	RESPONSES	
Very likely	56.73%	430
Likely	29.16%	221
Neither likely nor unlikely	8.18%	62
Unlikely	3.56%	27
Very unlikely	2.37%	18
TOTAL		758

Vancouver Island Corridor (VIC) Trail Use

Trail users were asked a number of questions on their use of VIC trails. The first such question asked trail users whether they “use a trail-developed section of the Vancouver Island Corridor (E&N Rail Corridor) either as a Vancouver Island resident or while visiting Vancouver Island, or would ... use such a section if it were nearby”. Of the 761 respondents who answered this question, 652 (86%) indicated that they do or would.

VIC trails users or would be users were then asked a series of questions about using VIC trails. The first asked them for what purpose they would use a continuous VIC trail. The most common identified uses were recreation (93%) and health and exercise (87%). Interestingly, almost 1/3 of respondents (32%) identified commuting as a use. This is particularly important if VIC trail development is seen as a part of an active transportation strategy that would pair such development with public transit options and trail continuity could be particularly important for such a strategy.

Table 20 - If the entire Vancouver Island Corridor was developed as a trail, which of the following purposes might you use the trail for? Check all that apply

ANSWER CHOICES	RESPONSES	
Recreation	93.45%	628
Health and exercise	86.90%	584
Commuting	32.44%	218
Fitness training (marathon, triathlon)	30.36%	204
Other (please specify)	14.14%	95
Total Respondents: 672		

VIC trails users or would be users were then asked how important trail continuity is to them. The vast majority of respondents agreed that continuity is important (93%) with 72% agreeing that it is very or extremely important.

Table 21 – Consider your use or potential use of trails along the Vancouver Island Corridor. How important to you is greater continuity and less interruption of the trails, such as at creeks, rivers, and other difficult topography?

ANSWER CHOICES	RESPONSES	
Extremely important	37.85%	254
Very important	33.98%	228
Somewhat important	21.31%	143
Not so important	5.81%	39
Not at all important	1.04%	7
TOTAL		671

Willingness-to-Pay for the FORT-VI Proposed Trail

BC survey respondents were asked about their willingness-to-pay (WTP) for the development and maintenance of the FORT-VI proposal. As noted earlier, the WTP approach is commonly used in economic studies to estimate the social value of an amenity, a public good, an environmental investment, or other investment without a market value. A maximum of three consecutive WTP questions were asked. The questions were preceded by the following preamble:

Note: this is a hypothetical scenario.

Assume that re-establishing rail service along the corridor is not economically viable, and that the FORT-VI active transportation option for the Corridor is being considered. This option would develop the entire Corridor north of Langford, including the section from Parksville to Port Alberni, into a non-motorized (e-bikes allowed) multi-purpose trail.

Further assume that this trail would be of a similar quality as the Galloping Goose trail with paved sections near population centres and more rugged sections in rural or wilderness areas. Further assume that the development and maintenance costs of this trail can be financed via existing taxes or via an increase in taxes (either income, property, or fuel taxes or a combination). If the project is financed without tax increases, it will compete for financing with other potential public projects you may support. FORT-VI is not responsible for financing the trail proposal or for levying taxes. We simply seek your input on what the project is worth to you and thus your willingness to pay for it, recognizing that all publicly financed projects are paid for by taxpayers.

The following (up to) three questions are designed to elicit your maximum willingness to pay (annually) for such a trail. The iterative approach start with a number, which you accept or not.

There are up to two follow-up questions to narrow the range of what is acceptable to you.

WTP questions were worded as follows:

Would you be willing to pay \$XX annually to support the Vancouver Island Corridor trail?

Respondents could answer, yes, no, or don't know. The "don't know" option was included to ease respondent strain, but was treated as a "no" response in the analysis below, to make estimates more conservative.

The first WTP question randomly assigned WTP amounts of \$20, \$30, \$40, and \$50 to respondents, with a maximum of \$50 overall. Amounts for the next two questions were based on responses to the previous question. With \$50 being the highest amount, if a person was randomly assigned \$50 in the first question, or was assigned that amount as a result of a previous answer, and answered that they would be willing to pay that amount, no further WTP questions were asked of that respondent. Acquiescing to \$50 indicates that the respondent is willing to pay at least \$50, the maximum proposed amount. Table 22 shows how many respondents were randomly assigned the amounts for the four initial questions, how the logic of follow up questions was applied, what WTP amounts were used in follow-up questions, how many respondents belonged to each sequence of questions and responses, and the WTP ranges inferred from the sequence of questions and responses. More generally, if the respondent indicated that they were willing to pay the proposed amount, the next question proposed a higher amount, unless the accepted amount was \$50. And, if the respondent was either unwilling to pay or responded "don't know" to the question, the next question proposed a lower amount.

Looking at an example from Table 22, we can see that a respondent who was asked if they were willing-to-pay \$20 in the first question and responded "yes" would then be asked if they were willing to pay \$35. If they responded "no" to the first question, they would then be asked if they were willing to pay \$10. A total of 162 (136+26) of the 718 respondents were asked if they were willing to pay \$20 in the first question. Of these 136 (84%) said yes and 26 (16%) said no or don't know. If the respondent said "yes" to both \$20 and \$35, they would finally be asked if they were willing to pay \$50. If they also said "yes" to that, their WTP range 50+ (willing to pay at least \$50). If a respondent said "yes" to \$20 and "no" to \$35, they would then be asked if they were willing to pay \$30. If they said "yes", their WTP range would then be \$30-\$35. If they said no, their WTP range would be \$20-\$30. The same logic applies to the rest of the table. The last

column (*n*) next to WTP range shows the number of respondents for that sequencing of questions and responses. A total of 718 BC respondents answered the WTP questions.

Table 22 – Willingness-to-Pay Questions Sequential Logic and Outcomes

WTP1	Distribution		WTP2	Distribution		WTP3	Distribution		WTP Range	<i>n</i>
\$20	Y (136)	84%	\$35	Y (118)	87%	\$50	Y (93)	79%	50+	93
				N/DN (25)			21%	(35,50)	25	
			N/DN (18)	13%	\$30	Y (6)	33%	(30,35)	6	
			N/DN (12)			67%	(20,30)	12		
	N/DN (26)	16%	\$10	Y (5)	19%	\$15	Y (1)	20%	(15,20)	1
				N/DN (21)	81%	\$5	N/DN (4)	80%	(10,15)	4
			Y (3)			14%	(5,10)	3		
			N/DN (18)			86%	(0,5)	18		
\$30	Y (136)	77%	\$40	Y (113)	83%	\$50	Y (93)	82%	50+	93
				N/DN (23)	17%				(40,50)	20
	N/DN (40)	23%	\$15	Y (12)	30%	\$20	Y (5)	42%	(20,30)	5
				N/DN (28)	70%	\$10	N/DN (7)	58%	(15,20)	7
			Y (3)			11%	(10,15)	3		
			N/DN (25)			89%	(0,10)	25		
\$40	Y (144)	75%	\$50	Y (118)	82%				50+	118
				N/DN (26)	18%				(40,50)	26
	N/DN (48)	25%	\$20	Y (19)	40%	\$30	Y (2)	11%	(30,40)	2
				N/DN (29)	60%	\$10	N/DN (17)	89%	(20,30)	17
			Y (5)			17%	(10,20)	5		
			N/DN (24)			83%	(0,10)	24		
\$50	Y (137)	73%	\$30						50+	137
				Y (14)	27%	\$40	Y(3)	21%	(40,50)	3
	N/DN (51)	27%	\$30	N/DN (37)	73%	\$15	N/DN(11)	79%	(30,40)	11
							Y (12)	32%	(15,30)	12
								68%	(0,15)	25
									Total	718

Table 23 shows the WTP range distribution derived from questions and responses. The majority of respondents (441 or 61%) were willing to pay at least \$50 annually to support the proposed trail. An additional 116 or 16% were willing to pay between \$30 and \$50, 69 or 9.6% were willing to pay between \$5 and \$30, and 92 or 13% were willing to pay between \$0 and \$15. This latter group consists of respondents who answered “no” or “don’t know” to *all* WTP questions, leading to ranges that include “\$0” as the lower-bound amount. Since no question was asked as to whether respondents were willing to pay at all and these respondents answered “no” or “don’t know” to all WTP questions, subsequent analysis treats this group of responses as zero WTP.¹²

Table 23 – WTP Range Distribution

WTP Range	<i>n</i>	%	Subtotals	
0-5	18	2.5%		
0-10	49	6.8%	92	12.8%
0-15	25	3.5%		
5-10	3	0.4%		
10-15	7	1.0%		
10-20	5	0.7%	69	9.6%
15-20	8	1.1%		
15-30	12	1.7%		
20-30	34	4.7%		
30-35	6	0.8%		
30-40	36	5.0%	116	16.2%
35-50	25	3.5%		
40-50	49	6.8%		
50+	441	61.4%	441	61.4%
Total	718	100.0%	718	100.0%

Table 24 shows WTP estimates from the survey sample. Two sets of estimates are calculated: one estimates WTP for BC residents 18+ as a whole using reported WTP by all BC sample respondents. The other estimates WTP for VI residents 18+ using reported WTP by VI sample respondents. The WTP estimates are calculated for education and age subgroups, to adjust WTP estimates for over- and under-representation of age and education subgroups. The adjustment is based on the 2016 Census BC population (2.7% subsample) distribution and aggregation is based on the 2018 total population estimates for BC and VI. For example, the first subgroup is composed of people aged 18-34 with a high school education or less, and post-secondary certificate and diploma. Census estimates from 2016 indicate that this subgroup represented 13% of the BC population aged 18 years and over in 2016. The estimated BC population 18+ in 2018 was 4,126, 392 and the estimated BC population in that subgroup is 534,780. According to the sample WTP estimates, the average annual WTP for individuals in this group is \$38.88. The

¹² One respondent contacted me, indicating that they responded ‘no’ to all of the WTP questions because they thought that such a trail would provide compensating savings or revenues, presumably relating to health care and tourism. Unfortunately, while this may be true, these savings or additional revenues not estimable in my view.

aggregate BC WTP for individuals in this group is \$38.88 x 534,780 equals approximately \$20.8 million. This exercise is repeated for all subgroups which yields an aggregate BC WTP for all those aged 18+ of \$216.1 million. Note that the average WTP for some age groups is higher than \$50. This is because respondents who agreed to \$50 may also have agreed to higher amounts. The statistical procedure to arrive at these estimates accounts for this.

Now, since most of the survey respondents were from VI (of the 710 who provided age and education information, 653 were from VI and 57 from the rest of BC), one could argue that there is not enough BC representation in the sample to aggregate WTP across BC. Therefore aggregate VI WTP estimates were also calculated using the same process (deleting rest-of-BC respondents to arrive at subgroup WTP estimates). Aggregate VI WTP was estimated at \$36.7 million.

Table 24 – Willingness-to-Pay Estimates from Survey Sample

Education	Age	% Pop 18+ ¹	BC		VI Aggregate WTP \$/Year, Using Sample Estimates	
			Sample Average WTP \$/Year	VI Sample Average WTP \$/Year		
1*	18-34	0.13	38.88	20,794,610	36.20	3,300,628
2**	18-34	0.07	38.39	10,914,500	36.81	1,783,966
3***	18-34	0.07	48.19	14,178,726	46.77	2,345,648
1*	35-44	0.05	43.44	8,764,971	42.68	1,468,057
2**	35-44	0.05	42.94	9,427,107	43.28	1,619,723
3***	35-44	0.05	52.75	11,840,194	53.24	2,037,394
1*	45-54	0.07	53.30	14,669,419	53.90	2,528,796
2**	45-54	0.06	52.80	13,836,003	54.50	2,434,417
3***	45-54	0.05	62.61	12,994,461	64.46	2,280,776
1*	55-64	0.08	60.72	19,542,205	61.35	3,366,319
2**	55-64	0.06	60.22	15,680,324	61.95	2,750,039
3***	55-64	0.04	70.02	11,269,010	71.91	1,972,948
1*	65+	0.11	57.75	25,617,162	56.73	4,289,840
2**	65+	0.07	57.26	15,522,130	57.33	2,649,667
3***	65+	0.04	67.06	11,040,612	67.29	1,888,705
Total		1.00		216,091,434		36,716,923
n (sample)		710				
n (census)		98,242	1. Population distribution by education and age is based on BC 2.7% Census sample, 2016			
N (BC)		4,126,392	BC Population 18+, 2018			
N (VI)		703,452				

*No college or university or other certificate, diploma or degree; secondary (high) school diploma or equivalency certificate or less

**College or university certificate or diploma

***University degree

An additional concern that may be raised regarding these estimates is that while the estimates were adjusted to reflect the underlying population's age and education, they were not adjusted to reflect interest in trails. As indicated earlier in the report, 98% of survey respondents are trail users, or would be if one was nearby. But does this reflect the population? In order to answer this question we can turn to the following related question asked in the 2015-16 Canadian Community Health Survey:

In the last 7 days, that is from last [day of the week 7 days ago] to yesterday, did you use active ways like walking or cycling to get to places such as work, school, the bus stop, the shopping centre or to visit friends?

According to that survey, 50.3% of BC respondents (aged 18+) answered "yes"¹³. Given that the question did not include "for leisure activities" and that presumably, the vast majority of people who walk or cycle would prefer to do so on a trail than on a sidewalk or on the road, one can assume that at least half of the BC/VI population would be supportive of trails and willing to pay for them. Cutting BC WTP and VI WTP estimates by half yields \$108 and \$18.3 million respectively. Assuming a zero discount rate and no inflation, the VI WTP cumulative WTP over a 20 year period would amount to \$366 million, which could well be enough to support the conversion and annual maintenance costs of the trail for 20 years. Moreover, once the conversion was effected, additional periodical capital upgrades should be less than the initial one while annual residents' WTP should likely at least be stable and possibly grow.

Vancouver Island Visitors

Survey respondents who reside outside of VI were asked questions regarding their travels to VI. The first question asked them about the frequency of their visits. Of the 106 respondents, 56 were from BC and 50 from outside the province. None of the BC residents reported never or having only once visited VI in the past five years and 87% responded having visited at least once per year. And, 48% of the non-BC residents responded having never or only once visited VI in the past five years, while 16% responded having visited at least once per year. Hence, of the non-VI resident respondents to this survey, most tourism activities were from BC residents.

Table 25 – On average, how often have you visited Vancouver Island in the past five years?

Response	Residence			
	BC	BC	Non-BC	Non-BC
Never	0	0.0%	9	18.0%
Once	0	0.0%	15	30.0%
Twice	2	3.6%	12	24.0%
Three or four times	5	8.9%	6	12.0%
Once per year	4	7.1%	6	12.0%

¹³ Author tabulations from the 2015-16 Canadian Community Health Survey.

Twice per year	9	16.1%	1	2.0%
More than twice per year	36	64.3%	1	2.0%
Total	56	100%	50	100%

The next question, regarding VI visitors' length of stay, was only asked of respondents who did not respond "never" to the previous question. In addition, one respondent to the previous question skipped it, yielding 96 respondents. Table 26 shows that while BC visitors to VI make more frequent visits than non-BC visitors, non-BC visitors tend to stay longer: while 73% of BC visitors stay for an average of 1 to 8 days and 27% an average of 9 or more days, 52.5% of non-BC visitors stay for 1 to 8 days and 47.5% stay for 9 or more days. This is a reasonable finding as more distant trips should normally be associated with longer stays.

Table 26 - On average, how many days per visit to Vancouver Island do you spend?

Response	Residence			
	BC		Non-BC	
1-3 days	18	32.1%	9	22.5%
4-8 days	23	41.1%	12	30.0%
9-13 days	7	12.5%	10	25.0%
14 or more days	8	14.3%	9	22.5%
Total	56	100%	40	100%

The next question asked visitors to rank the importance of trail availability in their travel plans. Very few respondents, whether from BC or from outside of BC rated this importance as low (not so important or not at all important). This is to be expected as trail users would be more likely to self-select into answering this survey. But Table 27 also shows that non-BC respondents were more likely to rate the availability of high quality trails as "extremely" important with 45% of these respondent choosing this rating compared to 29% for BC respondents. This suggest that the proposed trail could very well act as a tourism booster for BC. However, self-selection of trail users into the survey may even be stronger for non-BC residents, as BC residents would normally be interested in BC policy more generally than non-BC residents, who would more likely be interested in the survey because it is a trail survey.

Table 27 - How important is the availability of high quality trails on Vancouver Island to your decision to visit the Island

Response	Residence			
	BC		Non-BC	
Extremely important	16	28.6%	18	45.0%
Very important	19	33.9%	12	30.0%
Somewhat important	19	33.9%	8	20.0%
Not so important	2	3.6%	0	0.0%
Not at all important	0	0.0%	2	5.0%
Total	56	100%	40	100%

The next question asked visitors how much they spend on average in a day during their visit to VI. Generally, non-BC visitors reported a higher amount of spending: 52% of BC visitors reported spending less than \$100 per day while 42.5% of non-BC visitors reported spending that amount; and 21% of BC visitors reported spending \$200 or more, while 30% of non-BC visitors reported spending that amount. This is reasonable, as one might expect that local visitors are more likely to have family and friends on the island and more distant visitors are more likely to spend more on less frequent but longer trips.

Table 28 - When you visit Vancouver Island, on average, how much (in Canadian dollars) do you typically spend per day during your visits, including food, lodging, and other spending, for yourself only (exclude the cost of other family members or partners)?

Response	Residence			
	BC		Non-BC	
Less than \$50	6	10.7%	6	15.0%
\$50 to less than \$100	23	41.1%	11	27.5%
\$100 to less than \$200	15	26.8%	11	27.5%
\$200 to less than \$400	5	8.9%	6	15.0%
\$400 or more	7	12.5%	6	15.0%
Total	56	100%	40	100%

The next questions asked visitors how much they typically spend overall on themselves for a trip to VI. As expected, and consistently with related responses, non-BC residents are more likely to spend more, with 42.5% reporting spending \$600 or more on their trip compared to 28.6% of BC residents and 37.5% reporting spending of less than \$400 compared to 62.4% of BC residents.

Table 29 - When you visit Vancouver Island, how much (in Canadian dollars) do you typically spend on your round trip for yourself only (exclude the cost of other family members or partners)?

Response	Residence			
	BC		Non-BC	
Less than \$100	6	10.7%	6	15.0%
\$100 to less than \$200	11	19.6%	4	10.0%
\$200 to less than \$400	18	32.1%	5	12.5%
\$400 to less than \$600	5	8.9%	8	20.0%
\$600 to less than \$1,000	13	23.2%	13	32.5%
\$1,000 or more	3	5.4%	4	10.0%
Total	56	100%	40	100%

The next question for visitors asked them how long it takes them to travel to VI on their visit. This type of question together with the question that follows on their hourly wage and the previous question on how much they spend is typically used in studies that seek to establish a value to users of environmental amenities such as parks and trails. This approach is referred to as the “travel cost method”, where travel costs to the amenity of users of the amenity, including

the value of their time as estimated by their wage rate, are aggregated to arrive at a lower-bound estimate of the value of the amenity (Pearce, Atkinson, & Mourato, 2006). This approach would typically be implemented via a survey of users of the amenity (a survey circulated to park or trail users). In this particular study, a different research methodology was used to determine the social value of the trail, namely the willingness-to-pay approach, which does not focus on users, since the proposed trail doesn't exist, but rather focusses on the WTP of residents/taxpayers of the region responsible for financing the proposed amenity. Nevertheless, this use of the travel cost approach for non-residents may provide useful comparisons with what has been found in the literature regarding average travel cost spending by trail or other amenity users, a line of inquiry to be developed in more academic studies of this survey.

According to Table 30, and again as should be expected, non-BC visitors spend more time traveling to VI than BC visitors: 70% of BC visitors reported spending less than 10 hours traveling to VI compared to 20% of non-BC visitors. The results of the wage question are not reported here and they are not relevant to the focus and scope of this report.

Table 30 - When you visit Vancouver Island, how many hours does it typically take you to travel here and back to your usual residence, including waiting time and layovers?

Response	Residence			
		BC		Non-BC
Less than 10	39	69.6%	8	20.0%
10 to less than 20	13	23.2%	14	35.0%
20 to less than 30	2	3.6%	3	7.5%
30 or more	2	3.6%	15	37.5%
Total	56	100%	40	100%

VI actual and potential visitors (non-BC and non-VI but BC respondents) were finally asked how the development of the trail proposed by FORT-VI would affect their travel plans to VI. The vast majority of respondents (86%) indicated that the availability of proposed trail would entice them to visit VI.

Table 31 - Would the availability of an uninterrupted, non-motorized, multi-use trail along the Vancouver Island Corridor north of Langford to Courtenay and from Parksville to Port Alberni entice you to visit Vancouver Island, or to visit it more often?

ANSWER CHOICES	RESPONSES	
Very likely	54.81%	57
Likely	30.77%	32
Neither likely nor unlikely	13.46%	14
Unlikely	0.00%	0
Very unlikely	0.96%	1
TOTAL		104

Discussion

The FORT-VI survey results and analysis provide useful insights into how and why trail users use trails, the social value of trails to trail users and the overall population, and how the presence of high quality trails can support the tourism industry.

While survey respondents are not representative of the population, being older, more educated, and having higher incomes than what is found in the population distribution, their answers to trail use questions can inform FORT-VI and policy-makers on the uses made of multi-use non-motorized trails. The vast majority of the trail users responding to this survey use trails both on weekdays and week-ends (87%) with only 6% using them primarily on weekdays and 7% primarily on week-ends. Users identify many reasons for using trails: recreation (93%), health and exercise (87%), and commuting (32%). All of these uses are critical in the context of an aging population, skyrocketing health care costs, and climate change. High quality trails serve the needs of retirees, young families, and essentially all individuals, for free recreational opportunities that governments can support at a low cost per person. Free and accessible recreational opportunities benefit the disadvantaged: they are paid for by those who can afford to pay taxes but also enjoyed by those who cannot. They promote healthy behaviour¹⁴ which surely contribute to reducing health care costs and improve society's quality of life, and offer opportunities for commuters for low or no carbon emitting options. The support and development of high quality trails is also consistent with the BC Government's trail, active transportation, and climate objectives. No society that can afford such amenities and has a golden opportunity to use a suitable idle asset for such a purpose, and where the population demand for trails is high, should pass up such an opportunity.

As noted above, 50% of the BC population 18 years and older reported using active forms of transportation in the 2015-16 Canadian Community Health Survey. This, together with survey findings, suggests that the presence of (more) trails could contribute to increasing this participation rate. Several reasons were reported by survey respondents as to why they prefer trails over sidewalks or streets: less noise (90%), more natural environment (90%), safety (80%), and better air quality (67%), among others. Few could argue that sidewalks or streets provide a healthier, higher quality experience than trails, and if an important public policy objective is to increase active transportation, developing more high quality trails will undoubtedly support such an objective.

The analysis above used the contingent valuation approach to non-market asset valuation to estimate the social value of the trail. While the intent was originally to determine British Columbian's WTP for FORT-VI's proposal, too few non-VI respondents completed the survey for such an estimate to be realistic. Adjusting for demographics to reflect the unrepresentative nature of survey respondents, focussing on the VI population only, and halving the estimate to be in line with the population reporting using active forms of transportation yields a (recurring) annual WTP of \$18.3 million per year, or \$366 million over a 20 year period, with zero discounting or inflation taken into account, which may be sufficient to support the development and maintenance of the proposed trail over that period.

While the VI-WTP approach focuses on local users' valuation, it ignores the value that other BC residents may place on this amenity, and with most BC residents living in the lower mainland and frequently visiting VI, this is likely a serious understatement. Using a different valuation

¹⁴ For a thorough review of the benefits of trails, see the companion report by Cano (2019).

approach, it does not include other benefits such as those derived from increased tourism as a result of the availability of the trail. The vast majority of the VI visitors (87%) who responded to tourism-related questions indicated that the presence of the FORT-VI proposed trail would likely entice them to visit VI or visit it more often, although this is undoubtedly a biased sample of VI tourists, given the purpose of the survey. Nevertheless, VI is a popular tourist destination, and respondents to the survey reported spending significant amounts while visiting the Island, with 52% of respondents indicating that they spend \$100 or more per day on food, lodging, and other spending (for themselves only) during their visits, and over 13% spending \$400 or more per day.

Overall, the FORT-VI proposal appears to be consistent with stated provincial government policy objectives and of sufficient social value to be seriously considered by policy-makers. As discussed in the Background section, this type of public good / amenity is more appropriately funded via government funding (subsidies) than via user fees and given its province-wide and tourism attraction and potential health and other beneficial social impacts should be seriously considered for funding by the provincial government, as should other major trails in the province.

Conclusion

This report was developed for FORT-VI to estimate the social value of their rail-to-trail proposal for the Vancouver Island Corridor. The contingent valuation approach, commonly used by economists to place a social value on a good or service without a market value was used to arrive at the social value estimate. The contingent valuation approach surveys those who would be responsible to pay for the good or service via taxes. Taxes were argued to be the appropriate financing vehicle for the trail, because trails have the characteristics of a public good and have positive externalities. While it was not possible to obtain a representative sample of taxpayers for the survey, the willingness-to-pay calculations were adjusted to reflect the underlying population of interest via weighting adjustments on age and education, restricting the aggregate willingness-to-pay to Vancouver Island taxpayers, and dividing the results in half to match the BC adult population's reported participation in active transportation.

Findings suggest that when considering the estimated aggregate willingness-to-pay, and other benefits such as health care cost reductions, and contributions to tourism revenues, there is an excellent case to be made for this proposal. In addition, given the broad-ranging interest of this proposal to BC non-VI residents and the potential contributions just noted, it is argued that this proposal should be largely funded by the provincial government.

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