

# **POLICY PAPER**

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**TO BE CONSIDERED AT THE  
2014 UBCM CONVENTION**

**SEPTEMBER 2014**

**BOOK 01**

**PLEASE BRING THIS BOOKLET WITH YOU**



TO: UBCM MEMBERS  
FROM: Director Rhona Martin, President  
DATE: August 25, 2014  
RE: **POLICY PAPER TO BE CONSIDERED AT THE 2014 UBCM CONVENTION**

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## **INTRODUCTION TO UBCM POLICY DEVELOPMENT PROCESS**

UBCM is a policy-driven organization. Policy established at the annual UBCM Convention provides direction to the Executive and Secretariat.

Policy is established through two main routes:

- **Resolutions** on specific issues or concerns submitted by members, considered and endorsed at the annual Convention. Members submitted 159 resolutions this year for consideration.
- **Policy papers** developed and presented to Convention by the UBCM Executive where a broader comprehensive policy approach may be warranted.

Policy papers may be drafted at a number of levels of specificity:

- Overarching policies (UBCM General Policies)
- General themes (e.g. environment, aboriginal treaty negotiations)
- Topic specific (e.g. pension reform)

## **UBCM POLICY IN TOTALITY**

UBCM policy is comprised of both policy papers and resolutions.

Making changes to legislation or provincial policy is a process that can take many years. For this reason, resolutions and policies adopted at Convention but not accepted by government are recorded as standing UBCM policy.

This package – Book 1 – contains one paper:

### ***Socioeconomic Impact Analysis of BC Ferries***

Any other papers will be presented in Policy Book 2, which will be distributed on site at Convention.

Consideration of policy papers will occur during the policy sessions, Wednesday through Friday.

## UBCM: A POLICY-BASED ORGANIZATION

UBCM is directed by the policies established by its members. The two main ways members establish the organization's policy directions are through:

- **resolutions** endorsed at annual Conventions; and
- **policy papers** endorsed at annual Conventions.

This summary is included to provide some indication of the types and examples of previous policies that have guided UBCM.

### RESOLUTIONS

The past 25 years of UBCM resolutions and government responses are available on the UBCM website (ubcm.ca). Endorsed resolutions become part of ongoing UBCM policy until achieved or superseded. Even if a resolution is not acted on by, for instance, the provincial government after being endorsed at the UBCM Convention, the resolution does not lapse.

### POLICY PAPERS

These are comprehensive policy statements that fit under several categories of specificity.

#### **Overarching**

These policy papers set out broad policy. Examples are:

- *Statement of General Policies of the UBCM* 1996
- *Local Government and the Constitutions* 1993
- *Toward a Communities & Resource Strategy Paper* 1993
- *Delegation of Environmental Responsibilities* 1992

#### **General Themes**

The following are examples of policy papers in this category:

- *Financing Local Government: Achieving Fiscal Balance* 2008
- *Environment Action Plan* 2007
- *Proposal for Sharing Resource Revenues with Local Governments* 2004
- *Response to the Discussion Paper on Civil Liability* 2002
- *Forest Policy* 2002
- *Energy Policy Digest* 2002
- *Evaluating the Stability of BC's Assessment Rolls* 2000
- *UBCM Response to Bill 30: Gaming Control Act* 2000

#### **Specific Topics**

Finally, UBCM policy papers on specific topics would include:

- *Modernizing Building Code Safety Regulations* 2012
- *Packaging & Printed Paper Product Stewardship* 2012
- *Police Services in British Columbia: Affordability & Accountability* 2009
- *New Deal for Cities & Communities – Key Principles & Elements to Guide UBCM in its Negotiations* 2004

TO: UBCM Members  
FROM: UBCM EXECUTIVE  
DATE: August 25, 2014  
RE: **SOCIOECONOMIC IMPACT ANALYSIS  
OF BC FERRIES**

**POLICY PAPER  
#1**

2014 UBCM CONVENTION

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## 1. DECISION REQUEST

That the UBCM membership endorse the recommendations in Policy Paper #1 in response to the findings of the attached socioeconomic impact analysis (SEIA) of BC Ferries.

## 2. INTRODUCTION

The purpose of this policy paper is to:

- provide the UBCM membership with an overview of the work undertaken to date by the joint AVICC-UBCM Special Committee on BC Ferries; and
- seek member endorsement of proposed recommendations arising from the findings of the SEIA, *Boatswains to the Bollards: A Socioeconomic Impact Analysis of BC Ferries*.

The first part of this paper provides the background to the establishment of the Special Committee on BC Ferries. A brief overview of the Special Committee's work is followed by a summary of the key findings from the SEIA. The final section proposes a course of action in response to the findings of the SEIA and seeks the endorsement of the UBCM membership.

## 3. BACKGROUND

UBCM member interest in BC Ferries has been consistent for over a decade. Members have endorsed a number of resolutions related to ferry fares, operations, service levels, with the majority requesting that ferries be funded, administered and managed as an extension of the provincial highway system (2001-B64; 2002-B77; 2004-B59; 2007-B18; 2010-B20; 2010-B110; 2011-A3; 2012-B6; 2013-B12). Note that resolution 2014-C1 regarding coastal ferries, sponsored by Skeena-Queen Charlotte RD, is printed in the 2014 Resolutions Book and has been referred to this policy paper.

Consequently, when the Minister of Transportation and Infrastructure announced changes to BC Ferries service levels and fares in November 2013<sup>1</sup>, UBCM members, specifically coastal communities, expressed significant concerns. What was most disconcerting for local governments was the fact that the Province planned to commence implementation of these changes as early as April 2014, in the absence of any socioeconomic impact analysis. Both fare increases and service reductions, for minor routes, were implemented this past April.

UBCM and AVICC voiced concerns to the Minister about implementing the changes. On February 7, 2014, the two associations agreed to establish a Special Committee on BC Ferries. In the absence of information about the potential socioeconomic impacts of the announced changes, the Special Committee was charged with overseeing the work of a consultant to fill the information gap. The Executive extends its thanks to the members of the Special Committee for their significant contribution to this project; their dedication, expertise and knowledge have been invaluable.

Comprised of elected officials from UBCM, AVICC, Ferry Advisory Committee Chairs and Coastal Regional District Chairs, the Special Committee met from February to July 2014, and oversaw two phases of work. The first phase consisted of a survey of local governments, chambers of commerce, ferry advisory committees, and other stakeholders, focusing on ferry service reductions. A majority of some 400 respondents indicated that they expected negative impacts to business and tourism in response to fare increases and service reductions, and expressed concerns that there would be resulting declines in population, employment and property values for coastal communities. While the survey data was qualitatively significant, it did not quantify the socioeconomic impacts of ferry service reduction. Both associations supported the Special Committee extending its term to oversee Phase 2, a socioeconomic impact analysis (SEIA) to assess the relationship between ferry fare increases, passenger ridership levels and socioeconomic outcomes for BC communities.

Peter Larose of Larose Research and Strategy was contracted to undertake the research work. Under the direction of the Special Committee and working with a tight timeline, he framed his research to answer the following questions:

1. *Have ferry passenger fare increases from 2003-2013 reduced ridership levels? If so, how significant were the impacts and on which communities / routes?*
2. *What are the main factors that explain passenger volumes in the ferry system?*
3. *What is the economic impact of BC Ferries and how can we estimate its impact on not only coastal communities in BC, but throughout the province?*

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<sup>1</sup> “B.C. Charts Course for a Sustainable Coastal Ferry Service” (Nov. 18, 2013), retrieved Aug. 25, 2014, from <http://www.newsroom.gov.bc.ca/2013/11/bc-charts-course-for-a-sustainable-coastal-ferry-service.html>.

4. *Has reduced ridership from 2003-2013 resulted in “downstream” impacts in coastal communities, such as business formations and failures, population migration, property values, consumer prices, and other areas?*
5. *In light of historical trends in fare and passenger levels, what are the expected future trends?*

#### 4. REVIEW AND DISCUSSION OF FINDINGS

The SEIA undertaken by the consultant is the first piece of research work, to UBCM’s knowledge, that has attempted to quantify the socioeconomic impact of BC Ferries, not only to coastal communities, but to the province as a whole. The report by Peter Larose, *Boatswains to the Bollards: A Socioeconomic Impact Analysis of BC Ferries*, is attached for reference. The following provides a summary of his findings related to fares and ridership and overall economic impact of BC Ferries.

##### Ridership

- Ferry ridership has declined on nearly every route, with overall ridership declining by 11%, from 2004/05 to 2013/14;
  - The Northern Routes - most severe passenger declines of approximately 20-40%.
  - The Minor Routes - significant ridership declines of approximately 10-20%.
  - The Major Routes - lowest level of ridership declines of approximately 5-8%.
- Ferry ridership declines run counter to the trend of transportation volume increases in most other modes of transport in BC, including vehicle and air transport;
- Ferry passenger volumes are strongly (negatively) correlated with fares, and fare increases contributed to passenger volume declines from 2003-2013;
- The factors that most strongly explain variations in ferry passenger levels are changes in fares, provincial GDP, and provincial population;
- Ferry ridership declines are most strongly associated with declines in business incorporations and housing starts in coastal communities; while population migration and real estate prices in coastal communities have begun a downward trend since 2009 relative to historical trends, and when compared to non-coastal communities;
- Ferry passenger price sensitivity is estimated to be moderate overall, and increasing slightly over time.

## Economic Activity

- BC Ferries stimulates a total of \$1.8 billion in expenditures in BC each year, which produce \$1.5 billion annually in total value-added (GDP) for the BC economy;
- The total *organizational* GDP of BC Ferries is estimated to be \$545 million as of 2013, employing approximately 8,400 people (directly and indirectly);
- BC Ferries supports an estimated \$394 million in annual taxation revenues to:
  - federal (\$210 million),
  - provincial (\$150 million), and
  - municipal (\$34.2 million) governments;
- Using a gross cash-on-cash Return on Investment (ROI) formula, for every \$1.00 of tax revenues invested in BC Ferries, \$8.40 of economic activity was generated – much of which is in communities that are **not** coastal or ferry dependent.

## Foregone Economic Activity

- If fare increases had been limited to the rate of inflation from 2003-2013, it is estimated that passenger volumes would have grown 19% over the period, to 25.7 million in 2013 (compared with an actual ridership of 19.9 million in 2013);
- Foregone economic activity (gross) resulting from ferry traveller declines from 2003-2013 represents a reduction in GDP of \$2.3 billion over the ten year period (2003-2013);
- The foregone economic activity (gross) related to historical fare increases from 2003-2013 resulted in an estimated cumulative loss of \$609 million in tax revenues, including \$325 million to the federal government, \$231 million to the provincial government, and \$53 million to municipal governments.

The economic impact of BC Ferries on coastal communities and the provincial economy as a whole is substantial. Over 2003-2013, when nearly all modes of transportation in BC reported volume increases (ranging from 5 to 68%), BC Ferries recorded a decrease (-6.8%). Not only has a negative correlation between increasing fares and ridership been established, the quantitative impact of this reduced ridership across both coastal and non-coastal communities is significant. Equally noteworthy is the analysis of foregone tax revenues that could have accrued to all orders of government if fare increases had been capped at the rate of inflation. Based on these findings, and others reported in the SEIA, it appears that ferry fares are having a negative impact on ridership and this decrease in ridership is significantly impacting overall provincial GDP and tax revenues accruing to all orders of government. While some routes are more price sensitive than others, in the longer term, overall ridership will continue to decline as fares

continue to increase. This downward trend does not bode well for coastal ferry sustainability.

In its November 2013 announcement the provincial government articulated the goal of “an affordable, efficient and sustainable system” of coastal ferry service. It is difficult to see how the present policy of increasing ferry fares while reducing ferry service will enable the achievement of such a goal. In fact, the SEIA findings suggest that it would be wise to take a time out, or pause, in order to reflect on the policy path that has been chosen for coastal ferry service in BC, and consider whether other courses of action might now be more appropriate. UBCM does not profess to have all the answers, but in light of the SEIA findings it does appear to be time to revisit the existing policy direction and consider other options and strategies.

Also in the November 2013 announcement, the Province identified a number of strategies under consideration to create an affordable and sustainable ferry system beyond 2016. Included on the list were: introduction of a gaming pilot project on major routes, looking at standardized and no-frills vessels, liquefied natural gas propulsion, other alternative technologies, a new reservation and point-of-sale system, increased operational efficiencies, passenger-only vessels, and seeking federal infrastructure funding to renew the fleet and terminals.

Based on the SEIA, the strategy put forward by the Province to seek additional federal infrastructure funding has merit and could certainly be justified. *Figure 18* in the SEIA indicates that while it makes an annual investment of approximately \$27 million in BC Ferries, the federal government accrues \$210 million annually in tax revenues. In contrast the Province finds itself in a break-even position, contributing approximately \$150 million, receiving a similar amount in tax revenues. This SEIA could serve to support the Province’s funding request to the federal government. Since the federal government is a primary beneficiary of a strong and sustainable ferry system, a request to have larger return of those tax revenues invested in the system seems justifiable.

The findings of the SEIA confirm that:

- ferry ridership has been impacted negatively by increasing fares;
- all orders of government – federal, provincial and local – benefit from annual tax revenues generated from BC Ferries;
- all regions of the province are impacted by BC Ferries; whether through the economic activity generated in both coastal and non-coastal communities or from the tax revenues that are returned to all regions of the province by the provincial and federal government; and
- new strategies and policy options need to be considered in order to ensure an affordable, efficient and sustainable coastal ferry system well into the future.



## 5. OPTIONS FOR A WAY FORWARD

Learnings from the SEIA suggest that BC needs to move beyond the existing policy options and seek other approaches that will support the development of a sustainable coastal ferry system. In his January 2012 report, BC Ferry Commissioner Gord Macatee announced, “fares have reached the tipping point, imposing a hardship on coastal communities and passengers, and ridership has declined as a result.” Unfortunately the Commissioner’s recommendation to cap fare increases at the rate of inflation was not implemented, and fares on all routes are expected to continue to increase at nearly double the rate of inflation. And as the SEIA has indicated, increasing fares will only continue the downward trend of reduced ridership, resulting in significant economic impact for the province as a whole.

The Province has indicated that it is looking at a number of other strategies that will reduce costs and improve the existing ferry system. While UBCM members support provincial efforts to improve the ferry system, there is concern that proposals to date reflect “one-off” approaches to deal with the shortfall in revenue, instead of taking a more comprehensive, forward looking approach that examines the ferry system in a holistic manner. It is for this reason that UBCM members have repeatedly asked the Province to develop a long-term strategy to ensure the sustainability of the coastal ferry system. Recognizing the importance of this ferry system in connecting our province, coastal communities have sought to be part of the discussion that will lead to the development of that long-term strategy.

However, before steps can be taken to establish a way forward, better and more information needs to be provided to interested parties so that decisions and plans can be made with the best information possible. While the attached SEIA does not proclaim to have all the answers, it goes a long way to providing such information, and can serve as a first step toward dialogue and further analysis. We would hope that the findings of the SEIA could act as a catalyst for the provincial government to undertake further socioeconomic impact analyses that would support the development of a long-term strategy.

Obviously one element of a long-term strategy would be an examination of how the ferry service is funded. The SEIA highlights the fact that fare increases are not sustainable and other options need to be considered. Founded on the SEIA findings, the Province can build a rationale for seeking additional funding from the federal government to support the coastal ferry system, based on the significant tax revenues returned to federal coffers through the positive economic impact of BC Ferries. The request for federal funding assistance could be made even stronger if the Province acknowledged that the coastal ferry system was an extension of the highway system. As such, the coastal ferry system could then be seen as the final transportation link that connects coastal BC with the rest of the highway system that then ties this country together.

The purpose of this policy paper and the attached SEIA is to encourage the Province to take action. The SEIA findings are significant and warrant consideration. If we are to find a way forward, we must recognize the existing course is not viable and more needs to be done. We hope this policy paper and the SEIA findings stimulate discussion, serve as a call to action, and set BC on the path to developing a long-term strategy for affordable, efficient and sustainable coastal ferry service.

## **6. RECOMMENDATION**

That the UBCM membership endorse the following actions:

- Request that the Province reverse its November 2013 decision, and restore service levels and ferry fares to 2013 levels.
- Request that the Province take a 'pause' or 'time out' to consider the results of this SEIA and commit to undertaking further socioeconomic impact analysis that will build on these findings.
- Request that the Province take action to recognize the coastal ferry system as an extension of the highway system and administer and fund it accordingly.
- Request that the Province work cooperatively with coastal communities and other interested parties on the development and implementation of a long-term strategy for the coastal ferry system, based on solid socioeconomic impact analysis, that will ensure the sustainability of coastal communities and the ferry service.



# BOATSWAINS TO THE BOLLARDS

A Socioeconomic Impact Analysis of BC Ferries

Prepared By LAROSE RESEARCH & STRATEGY  
August 2014

Prepared for





## ACKNOWLEDGEMENTS

This report would not have been possible without the advice and input of several individuals, including the members of the UBCM / AVICC Special Committee on BC Ferries:

- Mayor Larry Cross, AVICC President, Town of Sidney
- Tony Law, Co-Chair, Ferry Advisory Committee Chairs, Hornby Island Trustee, Islands Trust
- Chair Colin Palmer, Coastal Regional District Chairs, Powell River Regional District
- Chair Jim Abram, Coastal Regional District Chairs, Strathcona Regional District
- Chair Joe Stanhope, Past President AVICC / Coastal Regional District Chairs, Nanaimo Regional District
- Chair Sheila Malcolmson, Coastal Regional District Chairs / Islands Trust
- Chair Art Kaehn, UBCM Community Economic Development Committee Chair, Regional District Fraser Fort George
- Chair Barry Pages, Skeena Queen Charlotte Regional District
- Chair Garry Nohr, Sunshine Coast Regional District
- Councillor Claire Moglove, AVICC Executive, UBCM Third Vice-President, City of Campbell River
- Councillor Barbara Price, Second Vice President, AVICC, Town of Comox

Additional advice and assistance was provided by Brian Hollingshead, Nicole Vaugeois, Ken Peacock, Mike Tretheway, Frank Bourree, and Bruce Carter.

Marie Crawford and Gary Maclsaac of UBCM provided many helpful comments and direction during the development of the report.

Several others provided information and perspectives to assist with this report, but asked to remain anonymous.

Finally, a special thank you to Gordon Clark, whose advice and assistance with the regression analysis and elasticity estimates strengthened the report's findings considerably.

## DISCLAIMER

The results in this report are estimates only, and are developed in order to provide initial assessments and guidance with respect to the impacts of ferry services on British Columbia's coastal communities. While all efforts were made to ensure the accuracy of information presented herein, the report relies extensively on third party data and analysis, and as such the author cannot be held responsible for any errors or omissions resulting from this third party data.

**Peter Larose, Principal  
Larose Research & Strategy**

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## BACKGROUND

Since 2003 BC Ferries has embarked on a series of fare increases and, more recently, service level rationalizations aimed at improving the overall financial position of the organization, and containing the level of required public investment in the organization. According to a BC Ministry of Transportation release in March 2003, the revitalized ferry system would result in “[i]mproved service and customer choice... [g]uaranteed service levels and fair rates... and [e]nhanced economic development and job creation.”

Over the next ten years, ferry fares increased at an unprecedented rate across the ferry system, with more pronounced increases on the Minor and Northern Routes, accompanied by ridership declines of varying degrees on nearly all routes. In May 2012 the BC Government amended the Coastal Ferry Act, which removed the requirement for all routes to move toward full cost-recovery, eliminated the prohibition against cross-subsidization of the Minor and Northern routes by the Major routes, and clarified the interests of ferry users with particular reference to the impacts of future fare increases on ferry travellers.

On October 1, 2012 the BC Ferry Commissioner announced the final Price Cap for the remainder of Performance Term 3, covering April 2013 through April 2015, and setting maximum fare increases to 4.1% (2013), 4.0% (2014), and 3.9% (2015). This was based on provincial government funding decisions for BC Ferries over the period, and was soon accompanied by a series of announced service level reductions, including the permanent cancellation of Route 40, which operated between Port Hardy and Bella Coola.

During this period, the provincial government and BC Ferries maintained that fare increases were required for the sustainability of the organization, and that fare increases have had little impact on past ridership levels. At the same time, numerous community representatives and business organizations were expressing concerns about declines in ferry ridership to and from their communities, citing ridership declines as the primary cause of various socioeconomic challenges, including business foreclosures, property value declines, population out-migration, and a variety of other concerns.

In response to these recent changes to the ferry system, and amid growing concerns within coastal communities, the Union of BC Municipalities (UBCM) and the Association of Vancouver Island & Coastal Communities (AVICC) commissioned Larose Research & Strategy to undertake a Socioeconomic Impact Assessment (SIEA) to assess the relationship between ferry fare increases, passenger ridership levels, and socioeconomic outcomes in coastal communities.

This report fills an important information gap. The report urges all stakeholders to send the boatswains (the head of the ship’s deck) to the bollards (mooring posts to which anchors are secured) so that we might all take a collective pause to review the evidence. In a system fraught with such entrenched and polarized opinions, accompanied by such paucity of objective evidence and analysis, a systematic review of the facts is long overdue.

## SUMMARY OF FINDINGS

This report is an initial assessment of the relationship between BC Ferries passenger fares, ridership levels, and socioeconomic outcomes in coastal communities. Findings are summarized below.

### GENERAL OPERATIONAL PERFORMANCE

- BC Ferries is among global leaders in most major ferry system operational performance categories, including on-time performance, farebox recovery, labour cost ratios, safety, customer satisfaction, and other areas;
- One of the weakest areas of relative performance (and deteriorating slightly over time) is the customer satisfaction category of “Value for Money”;

### FARES AND RIDERSHIP

- Ridership has declined on nearly every route, with overall “peak-to-trough” ridership declining 11% from 2004/05 to 2013/14;
- Ferry ridership declines run counter to the trend of transportation volume increases in most other modes of transport in BC, including vehicle and air transport;
- Ferry passenger volumes are strongly (negatively) correlated with fares (R-value = -0.73), and fare increases contributed to passenger volume declines from 2003-2013;
- The factors that most strongly explain variations in ferry passenger levels are changes in fares, provincial GDP, and provincial population;
- Ferry passenger price sensitivity (consumer price elasticity of demand - PED) is estimated to be moderate overall, and increasing slightly over time;
- The Northern Route Group has witnessed the most severe passenger declines from 2003-2013 (approx. 20-40%), and these passengers are highly price sensitive;
- The Minor Route Group has witnessed significant ridership declines on most routes (approx. 10-20%), and users of these routes are moderately price sensitive;
- The Major Route Group has had the lowest level of ridership declines (5-8%), but has also witnessed the lowest fare increases, suggesting that its users are among the most price sensitive in the system;

PED – Major Routes:	-0.85
PED – Minor Routes:	-0.30
PED – Northern Routes:	-0.59



## ECONOMIC IMPACTS

- BC Ferries stimulates a total of \$1.8 billion in expenditures in BC each year, which produce \$1.5 billion annually in total value-added (GDP) for the BC economy;
- The total organizational GDP of BC Ferries is estimated to be \$545 million as of 2013, employing approximately 8,400 people (directly and indirectly);
- BC Ferries supports an estimated \$394 million in annual taxation revenues to federal (\$210 M), provincial (\$150 M), and municipal (\$34.2 M) governments;
- Using a gross cash-on-cash Return on Investment (ROI) formula, for every \$1.00 of tax revenues invested in BC Ferries, \$8.40 of economic activity was generated – much of which is in communities that are not coastal / ferry dependent;
- If fare increases had been limited to the rate of inflation from 2003-2013, it is estimated that passenger volumes would have grown 19% over the period, to 25.7 million in 2013 (compared with an actual ridership of 19.9 million in 2013);
- Foregone economic activity (gross) resulting from ferry traveller declines from 2003-2013 represents a reduction in GDP of \$2.3 billion over the ten year period (2003-2013), including \$203 million in Finance, Insurance, and Real Estate, \$161 million in manufacturing, and \$67 million in construction;
- The foregone economic activity (gross) related to historical fare increases from 2003-2013 resulted in an estimated cumulative loss of \$609 million in tax revenues, including \$325 million to the federal government, \$231 million to the provincial government, and \$53.0 million to municipal governments;
- These economic impacts do not include impacts related to industrial input costs (including labour), export costs, commuter costs, and other non-ferry traveller related impacts.

## SOCIOECONOMIC OUTCOMES IN COASTAL COMMUNITIES

- Using a combination of historical trend analysis, statistical analysis, and comparative analysis, the impacts of ridership declines were assessed in socioeconomic areas such as population migration, business development, real estate prices & sales, employment, and others;
- Ferry ridership declines are most strongly associated with declines in business incorporations and housing starts in coastal communities;
- In socioeconomic areas characterized as “lagging indicators” the evidence is less conclusive regarding the impact of ridership declines on coastal communities:
  - Population migration and real estate prices have begun trending downward since 2009 relative to historical trends and non-coastal communities;
  - There appears to be no relationship between reduced ridership levels and coastal community (un)employment, nor with inflation.



## SECTION I: REPORT PURPOSE AND RESEARCH QUESTIONS

### REPORT PURPOSE

The purpose of this report is to explore the relationship between historical ferry fare increases and passenger ridership, identifying quantifiable impacts on coastal communities. It is primarily retrospective in nature, but also develops some initial forward-looking projections.

The report is intended to guide coastal community representatives, provincial and federal transportation policymakers, the business community, and other relevant stakeholder groups in understanding the impacts and risks of ferry fare increases on coastal communities, as well as the province as a whole.

### RESEARCH QUESTIONS

This report addresses the following questions:

1. Have ferry passenger fare increases from 2003-2013 reduced ridership levels? If so, how significant were the impacts and on which communities / routes?
2. What are the main factors that explain passenger volumes in the ferry system?
3. What is the economic impact of BC Ferries and how can we estimate its impact on not only coastal communities in BC, but throughout the province?
4. Has reduced ridership from 2003-2013 resulted in “downstream” impacts in coastal communities, such as business formations and failures, population migration, property values, consumer prices, and other areas?
5. In light of historical trends in fare and passenger levels, what are the expected future trends?

### GUIDING PRINCIPLES

In light of the polarized and politically charged environment in which British Columbia’s coastal ferries operate, this report was developed with the following guiding principles:

- *Transparency* - project objectives, processes, methodologies, and consultations were made available to stakeholder groups.
- *Objectivity* - all evidence was assessed and included in the development of this report, regardless of whether it supports the interests and/or positions of any particular stakeholder group.
- *Inclusivity* - diverse perspectives were sought of stakeholders with specialized knowledge and/or information regarding BC’s coastal ferry system.
- *Clarity* - to the extent possible, the report is written in non-technical language in order to assist with non-specialist understanding.



## CAVEATS AND LIMITATIONS

This report covers vast and complex territory. Due to its breadth, it should be considered an initial “scoping analysis” that provides initial insights into trends, impacts, and possible relationships among socioeconomic factors.

The report is guided by existing studies that have used best practices in socioeconomic impact analysis and transportation logistics. Where possible, these prior analyses have been updated with current data. Where primary research and analysis is undertaken, accepted best practices in econometric analysis, socioeconomic impact methodology, and comparative analysis are used.

Trend analysis is challenged by the fact that the reporting of BC Ferries has changed over time, making historical comparisons difficult. In many instances definitions and methodologies have also changed. Base fares began incorporating fuel surcharges from 2008/09 onward, and have also evolved from having multiple and variable rates (peak, off-peak, and shoulder rates) into a single fare for each route/user type. In some cases specific routes have alternated between Route Groups. Ferry fares also vary depending on the type of user, with frequent residential users typically utilizing Experience Cards, which have different fare structures, and for which rates of fare changes have varied from traditional cash-paying customers. All these factors compound the difficulties of this analysis, and are noted throughout.

This initial analysis should be validated using information held by government agencies and BC Ferries. Economic impact analyses using secondary sources should be updated with the BC Stats Input-Output Model. The regression analysis and elasticity modeling could be further expanded to include alternate methodologies.

Nonetheless, despite these limitations and challenges, the report’s findings are considered reliable, and it is expected that any further review and analysis will support the findings.

## SECTION II: BC FERRIES in CONTEXT

This section provides an overview of BC Ferries' structure, ridership and fare history, operational performance, and comparisons with other ferry operators around the world.

### BC FERRIES – STRUCTURE AND GOVERNANCE

The BC Ferry Authority (BC Ferries) was established in 2003 by an Act of the Legislative Assembly of British Columbia - *The Coastal Ferry Act*. It is a non-share capital corporation, meaning it is a quasi-independent authority that is technically “owned” by the Government of British Columbia, its sole shareholder, but whose management is guided as an independent corporation, with an elected and appointed Board of Directors, as well as a Chief Executive Officer.

### THE GOVERNANCE OF BC FERRIES INVOLVES THREE PRIMARY ENTITIES

1. The Government of British Columbia, through the Ministry of Transportation, which provides annual funding to the organization (the “Service Fee”), which is one of the main determinants of passenger fares. The government also sets high-level policy for the organization’s structure and governance.
2. The BC Ferry Commissioner, whose role is to provide guidance to BC Ferries on the fares it can charge to customers, as well as the frequency and capacity of sailings, based on funding provided by the Government of BC, among other expense and revenue factors. The Ferry Commissioner establishes a maximum price on fares (the fare “price cap”) which is established for Performance Terms (PTs) of four years in duration. The price cap has been historically set for three “route groups” – the Major Routes, Minor Routes, and Northern Routes.
3. BC Ferries, which develops organizational policies and procedures and manages the day-to-day operations of the organization.

### FARE HISTORY AND RIDERSHIP

Since 2003, BC Ferries has, under the direction of the provincial government and guided by the Ferry Commissioner, embarked on a strategy to recover an increasing proportion of its operational expenses, primarily by increasing fares charged to customers, and reducing service capacity (number of sailings) on routes and specific sailings that have relatively lower utilization rates (percentage of capacity filled by passengers).

**Figure 1**, (right) summarizes passenger volumes and price changes for each route group from 2003-2013.



**Figure 1.** BC Ferries Summary Statistics (2003-2013)

Fiscal Year	Ferry Passengers (Millions)	Ferry Vehicles (AEQS* -Millions)	Ferry Avg Price Chg - Majors	Ferry Avg Price Chg - Minors	Ferry Avg Price Chg - Northern
2003/04	21.37	9.349	0.51%	1.36%	0.16%
2004/05	22.03	9.665	3.45%	4.63%	4.05%
2005/06	21.73	9.655	6.99%	6.78%	8.12%
2006/07	21.66	9.615	9.33%	15.21%	4.58%
2007/08	21.79	9.713	14.0%	17.07%	14.28%
2008/09	20.73	9.201	34.41%	45.22%	45.37%
2009/10	21.04	9.315	37.75%	59.11%	51.97%
2010/11	20.75	9.219	42.38%	69.04%	67.09%
2011/12	20.17	8.862	47.78%	71.57%	66.04%
2012/13	19.9	8.769	51.18%	74.8%	65.88%
<b>Change</b>	-1.47 million (-6.8%)	-580,000 (-6.2%)	51.2%	74.8%	65.9%

\* AEQs are “automobile equivalencies” – a standardized measure of the typical automobile, used by BC Ferries to account for variation in vehicle lengths. Source: BC Ferries

As **Figure 1** shows, ferry ridership has declined by 1.47 million passengers per year (including passengers in vehicles), which is a 6.8% decline from 2003/04-2012/13. Vehicle traffic declined slightly less (-6.2%). The initial published returns of BC Ferries for 2013/14 show ridership dropping further to 19.6 million passengers, resulting in an 11% “peak-to-trough” decline in ridership from 2004/05 to 2013/14.

In the same period, average fares increased the most for Minor Routes (74.8%), followed by the Northern Routes (65.9%) and the Major Routes (51.2%).

## INDIVIDUAL ROUTE SUMMARIES

From 2003 to 2013 passenger volume changes for individual routes varied significantly. In general, more significant ridership declines were witnessed on the Northern Routes, where the routes are longer and average fares much higher.

**Figure 2. Passenger Volume Changes – All Routes**

Route Name	Route #	Pass Volumes (2003/04)	Pass Volumes (2012/13)	Change
Inside Passage (Port Hardy to Prince Rupert)	10	61,178	38,108	-37.7%
Skidegate Inlet (Graham Isl to Moresby Isl)	26	126,016	87,441	-30.6%
Discovery Coast (Port Hardy to Bella Coola)	40	9,321	6,949	-25.4%
Hecate Strait (Pr Rupert to Haida Gwaii via Skidegate)	11	46,462	35,791	-23.0%
Lambert Channel (Denman Isl to Hornby Isl)	22	260,901	208,253	-20.2%
Broughton Strait (Port McNeill to Alert Bay)	25	265,996	218,417	-17.9%
Discovery Passage (Campbell River to Quadra Isl)	23	926,054	785,170	-15.2%
Northumberland Channel (Nanaimo to Gabriola Isl)	19	907,645	771,783	-15.0%
Baynes Sound (Buckley Bay to Denman Isl)	21	544,105	463,752	-14.8%
Sutil Channel (Quadra Isl to Cortes Isl)	24	112,970	96,918	-14.2%
Active Pass (Tsawwassen to Salt Spring/South Gulf Isl)	9	501,502	434,839	-13.3%
Malaspina Strait (Powell River to Texada Isl)	18	193,330	170,604	-11.8%
Swanson Channel (Swartz Bay to Southern Gulf Isl)	5	505,797	459,393	-9.2%
Satellite Channel (Swartz Bay to Salt Spring Isl)	4	670,916	619,939	-7.6%
S Georgia Strait (Tsawwassen to Swartz Bay)	1	5,968,303	5,589,971	-6.3%
Jervis Inlet (Sunshine Coast to Powell River)	7	353,591	331,679	-6.2%
Georgia Strait Central (Nanaimo to Horseshoe Bay)	2	3,514,507	3,310,473	-5.8%
Queen Charlotte Channel (Horseshoe Bay to Bowen Isl)	8	1,198,828	1,132,383	-5.5%
N Georgia Strait (Powell River to Comox)	17	372,008	352,820	-5.2%
North Stuart Channel (Chemainus to Thetis/Kuper Isl)	20	258,647	247,556	-4.3%
South Stuart Channel (Crofton to Saltspring Isl)	6	496,454	478,733	-3.6%
Howe Sound (Horseshoe Bay to Langdale)	3	2,555,463	2,501,900	-2.1%
Mid-Island Express (Tsawwassen to Nanaimo)	30	1,341,917	1,374,878	2.5%
Thornbrough Channel (Langdale to Gambier/Keats Isl)	13	43,970	46,964	6.8%
Saanich Inlet (Brentwood Bay to Mill Bay)	12	121,549	154,384	*27.0%
	<b>Total:</b>	<b>21,367,530</b>	<b>19,919,098</b>	<b>-6.8%</b>

\* Route 12 ridership was down significantly in 2003/04 due to the main vessel being out of service for a prolonged period. Ridership was back up to 154,000 in 2004/05, making the trend essentially flat from 2003-2013. Source: BC Ferries

Overall, passenger volumes on Northern Routes (#10, #26, #40, #11) decreased the most. Most of the Minor Routes witnessed volume declines in the range of 10-20%, whereas the major routes(#1, #2, #3) typically lost 2% to 6% of their passenger traffic, with the exception of Route #30 which saw a slight (2.5%) increase over the period.

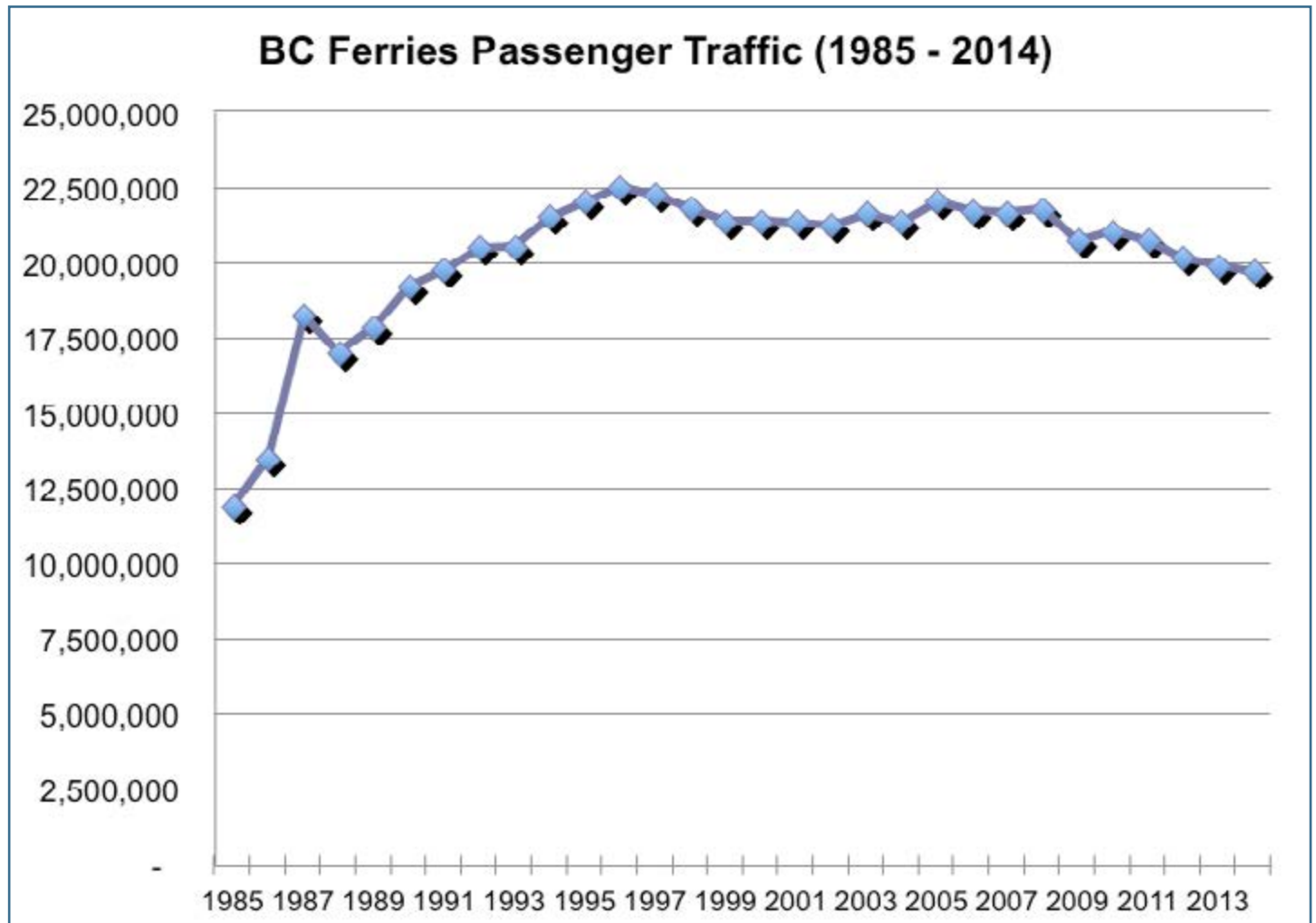
Two smaller routes – one a passenger-only service (#13) and the other a short commuter route (#12)



– witnessed passenger volume increases during the study period.

As **Figure 3** (below) demonstrates, passenger volumes increased dramatically from 1985 to the mid-1990s, stabilized for approximately ten years, then began to decline once again from 2005 onward.

**Figure 3.** BC Ferries Historical Passenger Volumes



As **Figure 3** shows, passenger levels in 2013 were at approximately the same level as 1991.

Source: BC Ferries

## COMPARISONS WITH OTHER JURISDICTIONS

In order to help contextualize this analysis, ferry systems from around the world were assessed to determine overall trends in operational performance, pricing, passenger volumes, and other general characteristics of this common mode of transport.

### SAILING COMPLETION AND ON TIME SERVICE DELIVERY

In 2012/13, BC Ferries completed 99.8% of its scheduled sailings. Of these, 92.3% of sailings were delivered on time, which is roughly equal to the 94% average of fourteen (14) ferry systems assessed

in a 2010 study conducted by Washington State Department of Transportation.<sup>i</sup> In light of the fact that BC Ferries operates in the second most northern (and volatile) climate of the fourteen regions that were assessed, and operates a number of relatively lengthy routes, this is a notable achievement.

## LABOUR COSTS

BC Ferries' labour costs in fiscal 2012/13 were \$263 million, in an operating budget of \$525 million, which equates to 50.1%.<sup>ii</sup> This is just slightly higher than the average of fourteen (14) ferry operators included in the Washington State survey of operational performance, which averaged 45.1%. Most of these entities operate in less heavily regulated jurisdictions, with fewer lengthy routes, and with passenger ridership concentrated on a smaller number of major routes. A number of these were also in less developed countries, with lower labour standards and relative income levels.

Despite the very public criticism leveled at BC Ferries by various organizations for its seemingly excessive compensation levels, the organization's labour costs remain competitive with other ferry service providers around the world.

## CUSTOMER SATISFACTION

In 2012/13 BC Ferries had an overall customer satisfaction level of 88%, up from 82% in 2003/04. Its average rating was 4.2 / 5.0 in 2012/13, an increase over its score of 4.0/5.0 in 2003/04.

In the service sector, satisfaction levels of 88% and 4.2/5.0 are very high, with most travel-related industries typically scoring in the 70-80% range, with the exception of airlines which trend between 65-70%.<sup>iii</sup>

The notable exception in BC Ferries' high customer satisfaction levels is in the category of "value for money," which is the lowest satisfaction area, scoring only 2.98/5.0 in FY 2012/13, which is down from 3.3/10 in FY 2003/04.

## FAREBOX RECOVERY – BC FERRIES

A common measure of operational performance by transportation providers – typically publicly funded agencies – is "farebox recovery" – which measures the proportion of operating expenses that are "recovered" through user fees. In the case of BC Ferries, this would be the total amount of revenues collected from fares relative to its operating expenses.

Compared with other global ferry systems and other modes of transit, BC Ferries has operated with high levels of farebox recovery, whether using only fares or fares combined with ancillary revenues (e.g., cafeteria and retail sales).





**Figure 4. Farebox Recovery Rates of Global Ferry Operators and Other Transit Providers <sup>iv</sup>**

Transport Provider	Year	Farebox Recovery Rate
Steamship Authority (Massachusetts) <sup>v</sup>	2009	94%
BC Ferries	2012/13	92%
New Zealand Interislander (national) <sup>vi</sup>	2012/13	77%
Fjord1 (Norway) <sup>vii</sup>	2009	67%
Washington State Ferries <sup>viii</sup>	2011/12	66%
Translink (Metro Vancouver) <sup>ix</sup>	2010	51%
Calgary Transit <sup>x</sup>	2010	50%
Sydney Ferries <sup>xi</sup>	2009	34%
BC Transit <sup>xii</sup>	2012/13	33%
Alaska Marine Highway System <sup>xiii</sup>	2009	26%

As **Figure 4** demonstrates, BC Ferries has a relatively high farebox recovery rate when compared with its competitive set in other jurisdictions, and particularly with other modes of publicly supported transit systems, including Translink in Metro Vancouver and Calgary Transit.

Historically, BC Ferries has always had a high farebox recovery rate, though this has increased from 79% in 2003/04 to 92% in 2012/13. When ancillary revenues are included, the farebox recovery rate increases to 109% in 2012/13.

**Figure 5. BC Ferries Farebox Recovery Rates (2003-2013)**

Year	Operating Expenditures (\$mill)	Tariff Revenues (\$mill)	Total Revenues*	Farebox Recovery	Farebox Recovery (all revenues)
2003/04	\$411.2	\$323.00	\$394.70	78.6%	96.0%
2004/05	\$426.4	\$345.90	\$422.20	81.1%	99.0%
2005/06	\$425.2	\$353.60	\$435.90	83.2%	102.5%
2006/07	\$445.5	\$363.20	\$452.30	81.5%	101.5%
2007/08	\$472.3	\$382.20	\$480.70	80.9%	101.8%
2008/09	\$501.2	\$429.10	\$522.60	85.6%	104.3%
2009/10	\$514.3	\$450.50	\$549.40	87.6%	106.8%
2010/11	\$527.5	\$458.00	\$557.20	86.8%	105.6%
2011/12	\$530.4	\$470.10	\$550.00	88.6%	103.7%
2012/13	\$524.9	\$484.10	\$571.40	92.2%	108.9%

\* Includes "ancillary revenues" which are primarily on-board sales of foods and gift shop items. Source: BC Ferries



It should be noted that farebox recovery is a complicated performance measure, in that higher farebox recovery may also mean lower levels of public investment, and lost opportunities for stimulating traffic through lower fares. This report will not comment on this matter of public policy but merely presents the data.

## TOTAL COST RECOVERY

Another common and related measure of performance is total cost recovery, which is the proportion of all revenues to all expenditures, including the cost of capital (e.g., new vessel construction and financing costs).

This measure has fluctuated between 2003-2013, primarily due to the increasing costs of capital. BC Ferries has undertaken an aggressive shipbuilding program in the past ten years, in order to modernize the fleet and maintain operational capacity. Of note, the total operating capacity of the organization has remained virtually unchanged in the past ten years, due to the retirement of a number of ageing vessels and from the replacement of the Queen of the North.

**Figure 6.** Total Cost Recovery – BC Ferries

Year	Total Expenditures (\$mil)	Cost of Capital (\$mil)	Total Cost Recovery %
2003/04	\$480.9	\$69.7	82.1%
2004/05	\$497.9	\$71.5	84.8%
2005/06	\$502.5	\$77.3	86.7%
2006/07	\$519.4	\$73.9	87.1%
2007/08	\$572.2	\$99.9	84.0%
2008/09	\$644.4	\$143.2	81.1%
2009/10	\$697.1	\$182.8	78.8%
2010/11	\$714.2	\$186.7	78.0%
2011/12	\$740.6	\$210.2	74.3%
2012/13	\$732.7	\$207.8	78.0%

Source: BC Ferries

## SUMMARY

Despite common criticism – and possibly broadly held public perceptions – BC Ferries compares favourably with its competitors in nearly all categories of operational performance. In fact, the only area where its performance could be questioned is in the overall “value for money” provided to its customers.



## DETAILED COMPARISON – WASHINGTON STATE FERRIES

BC Ferries is often compared with Washington State Ferries, owing to the similar size, geographic regions of operation, and generally similar political and economic systems in the Pacific Northwest.

From a comparative perspective, the two organizations also operate with somewhat different models, with BC Ferries operating a relatively “higher end” service (particularly on the Major Routes with newer vessels) compared with its more bare-bones competitor to the south, which generally operates with fewer on-board amenities and services. On a related note, Washington State Ferries are directly integrated within and managed by the Washington State Department of Transportation.

From 1999 to 2011, average vehicle fares (unadjusted) in Washington State increased by 84%, whereas average foot passenger fares increased by approximately 101%. This increase in fares in Washington State was largely in order to address revenue shortfalls associated with the passing of Initiative 695 in November 1999, which repealed the Motor Vehicle Excise Tax (MVET), eliminating more than 20% of its operational funding and 75% of its capital funding. <sup>xiv</sup>

During the same period (1999 to 2011), Washington State Ferries total passenger volumes declined from 26.8 million per year, to 22.2 million – a decline of 17%.

**Figure 7.** Washington State Ferries Fare and Passenger Volume Changes (1999-2011)

Passenger Fare Increases	101%
Vehicle Fare Increases	84%
Passenger Volume Change (actual)	-4.6 million
Passenger Volume Changes (per cent)	-17%

Source: Washington State Department of Transport (WSDOT)

While recognizing that external events played a role in passenger volume declines – particularly fuel price inflation (increases) and the economic recession in 2008/09, the majority of passenger declines were more closely correlated with ferry fare increases. As **Figure 8** (following page) demonstrates, the most significant passenger volume declines occurred following steep fare hikes in 2001 (20% fare hike; 4% passenger decline), and another in 2002 (12.5% fare hike; 3% passenger decline).

Figure 8. Washington State Ferries Ridership History (Source: Washington State Ferries) <sup>xv</sup>

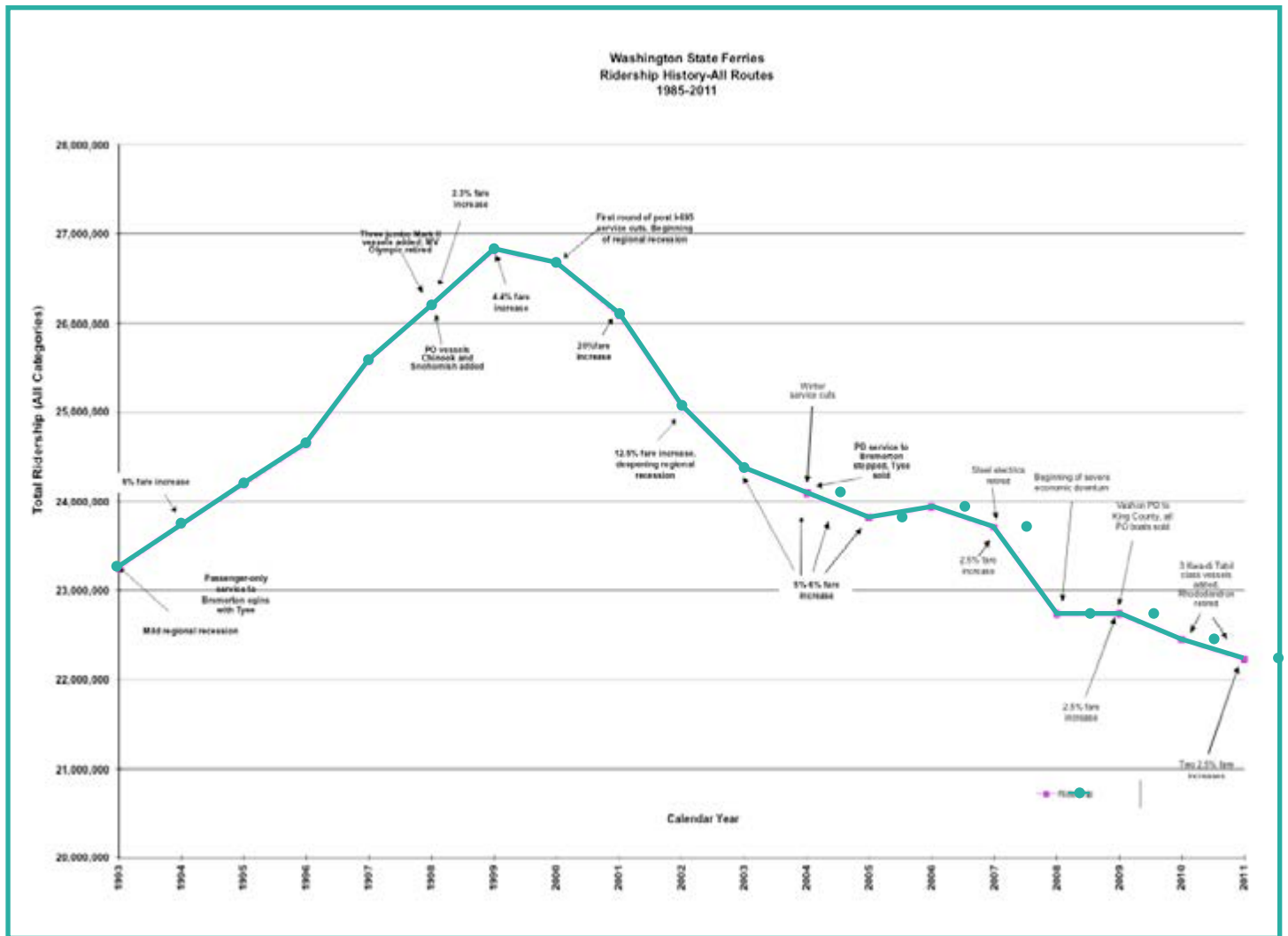
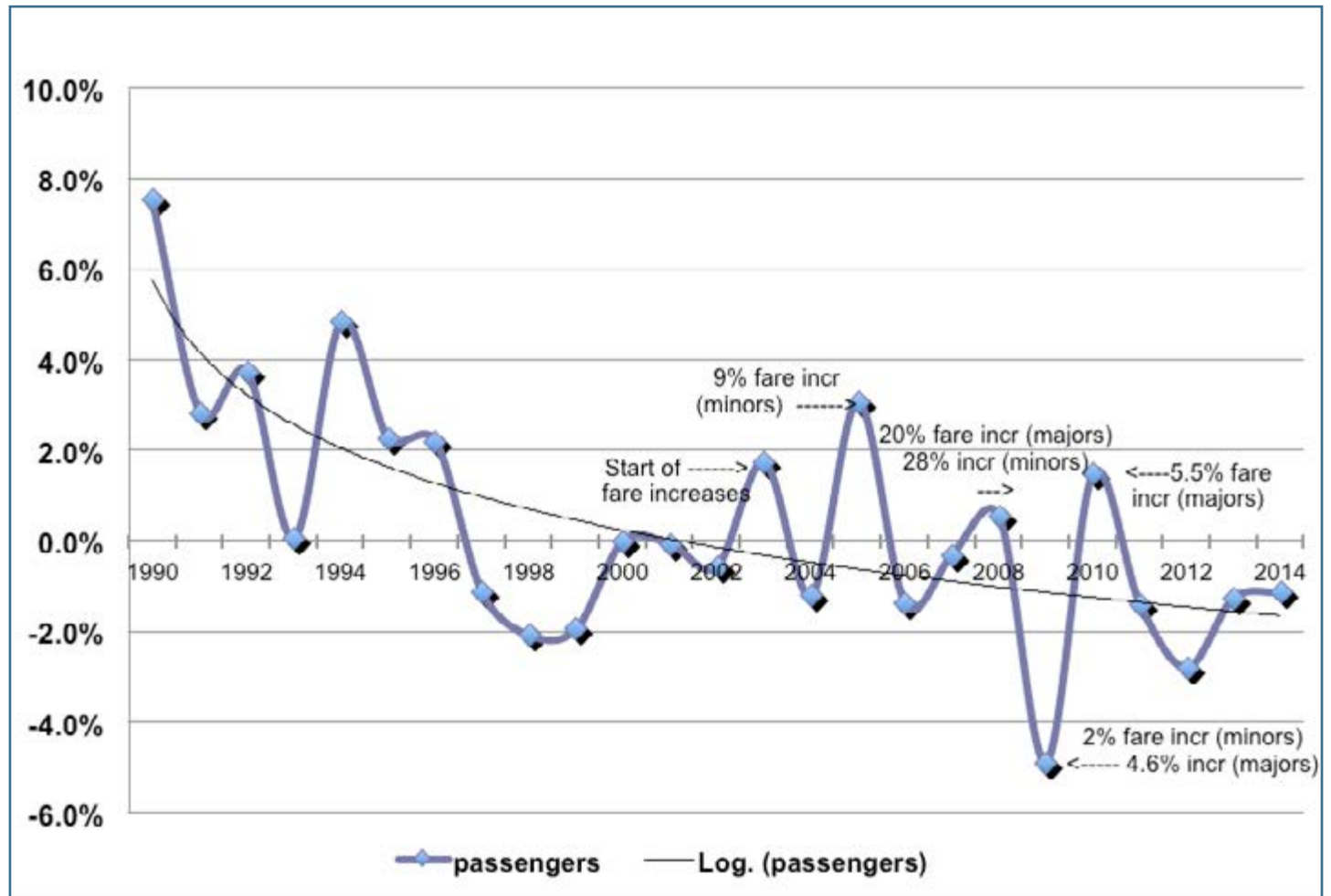


Figure 8 (above) demonstrates a clear relationship between ferry fares and ridership changes in Washington State. During the recession of 2008 onward, ridership remained relatively flat. The 2007 decline in ridership was due primarily to the retirement of the Steel Electric Line.



**Figure 9** (below) demonstrates a similar trend in British Columbia, with ridership declines (expressed as a percentage change year-over-year) occurring following more significant fare increases. However, there are a number of years when passenger traffic increased following fare increases, which means that fares alone provide an incomplete explanation of passenger volume variations. As we will see in later sections, there are a number of other factors, such as BC's population and GDP levels, when combined with fare increases, provide a more robust explanatory model.

**Figure 9.** BC Ferries Year-Over-Year Traffic Change (1990-2014)



Source: BC Ferries

## OTHER TRANSPORTATION VOLUME COMPARISONS

In order to provide further context of BC Ferries passenger declines since 2003, a number of other modes of transport were evaluated, including major and regional airports, as well as highway vehicle traffic volumes from across British Columbia.

None of these transportation modes showed a decline over the study period of 2003-2013, with the exception of a single highway juncture (Hwy 97 at Kersley, near Prince George), which is likely due to a decline in traffic associated with the major downturn in the region's main employer, the forest sector, related to the mountain pine beetle epidemic.

**Figure 10.** Transport Mode Volume Comparators <sup>xvi</sup>

Route / Transport Mode	Change (2003-2013)
YVR (Vancouver Int'l Airport)	+23%
YYJ (Victoria Int'l Airport)	+32%
YQQ (Comox Valley Airport)	+68%
Hwy 1 (Metro Vancouver)	+8.7%
Hwy 97N (Williams Lake)	+5.0%
Hwy 97N (Kersley)	-11.0% (2005-2013)
Hwy 1 (Revelstoke)	+14.3%
Hwy 99 (Squamish)	+16.0% (2005-2013)
Hwy 3 (Crowsnest Pass)	+32.4%
BC population	+11.1%
BC Ferries	-6.8%

The only transportation system that did experience passenger volume declines in the period was the BC inland ferries, which are operated by the BC Ministry of Transportation and which do not have any passenger nor vehicle fares. From 2004/05 ridership on inland ferries declined from 2.7 million passengers to 2.2 million passengers in 2011/12. <sup>xvii</sup>

However, there have been notable changes to the inland ferry network during this period, including the decommissioning of the Albion Ferry in July 2009 after construction of the Golden Ears Bridge that year. In addition, a number of alternate highway routes were improved throughout the province, particularly in the Kootenay-Rockies region, which may have altered transportation patterns.

Additionally, from both a common sense perspective and a transportation logistics perspective, it is not logical that inland ferry passengers would be decoupled from highway traffic patterns in the same region(s), unless one wishes to state that there is a widespread “ferry aversion” factor dissuading ferry travel. To some extent this is possible, if prior inland ferry users have had poor experiences (delayed sailings, long waits), and have chosen more reliable and predictable highway travel where possible. But even this speaks more to the impacts of inland ferry capacity constraints as opposed to a prima facie case of ferry use declining unrelated to factors such as user prices and relative convenience.



## SUMMARY

In the past 10 years, BC's coastal ferry system is virtually the only major transportation mode that has witnessed passenger volume declines.

Notably, all these modes of transportation were subject to the same external forces as BC Ferries, including fuel price inflation and the global financial crisis. However, in British Columbia the ferry system was the only one transport mode to experience passenger volume declines over the period.

Washington State Ferries are often held up as an example for BC to emulate, owing to its relatively lower passenger fares and, often, its lower compensation levels for executives. However, both entities have displayed similar trends in passenger volume increases during a more stable fare regime (1985-1999 in Washington State; 1990-2003 for BC) followed by ridership declines that coincided with significant fare increases. And in key measures of competitiveness, including farebox recovery and overall labour cost impacts, BC Ferries compares favourably with Washington State and other global ferry operators.

## SECTION III: ECONOMIC IMPACT ANALYSIS

This section examines the overall value of BC Ferries to the British Columbia economy, using different but complementary methods.

### ESTIMATING ECONOMIC IMPACTS OF BC FERRIES

Estimating the economic (and social) impact of BC Ferries is a challenging task due to the sheer magnitude and complexity of the coastal ferry system and its interlinkages with various communities, economic sectors, and user groups. Some goods that are transported by BC Ferries are less price sensitive because they can be substituted for alternate goods; others cannot. Some producers using BC Ferries can absorb fare increases in their costs, while others must pass along these cost increases onto their customers, whether wholesalers or final retail sellers. Consumers of some types of goods are more and less sensitive, depending on whether suitable locally produced goods can be purchased, and based on the very nature of the goods. The system is characterized by widespread heterogeneity in its pricing and consumption patterns, making economic impact analysis difficult.

Adding to this is the complexity of a coastal economy that has various external factors (e.g., global recession) that are not easily separated from the impacts of rising fares on ferry ridership.

Nonetheless, economists and statisticians have devised numerous methods that can be used to develop estimates of the organization's total value and impact on coastal communities, and to separate these impacts from broader external factors in the economy.

### THE VALUE OF BC FERRIES - ECONOMIC IMPACT ANALYSIS

There are a number of ways to describe the “value” of an entity – the total benefits derived from its activity – whether it is an individual business, an economic system, or a region.

The most common is through “economic impact analysis,” which measures or estimates the change in economic activity – typically sales revenue, employment, GDP, or other economic measures – of a change in policy, a project, a specific organization, business, or a region. This study employs two complementary but not mutually exclusive methodologies to estimate the Economic Impact of BC Ferries.

#### Estimating the Economic Impact of BC Ferries – Two Methods

1. The total economic output of the corporate entity, itself, based on operational revenues, spending by supplier industries, and recirculated BC Ferries staff wages and salaries in the economy.
2. The revenues of businesses “downstream” of BC Ferries and related impacts in the local economy from this stimulated business activity.

### METHOD 1: ORGANIZATIONAL ECONOMIC IMPACT ANALYSIS

The economic impact of BC Ferries as a corporation comprises the following components:

- **Direct economic impact** – the total businesses expenditures (the dollar value of all goods and services produced by BC Ferries)



- **Indirect economic impact** – the total value of goods and services produced by suppliers to BC Ferries – including manufactured goods, machinery, food and beverage, and other goods and services
- **Induced economic impact** – the sum of all employee spending throughout the BC economy

The sum of these three components is the **total economic impact**.

The economic impact of BC Ferries has been estimated in the past, and has been updated for the purposes of this analysis. <sup>xviii</sup>

**Figure 11:** Economic Impact of BC Ferries

	2005/06	2012/13
Total Business Revenues (\$ millions)	\$436*	\$574
<b>Direct Economic Impacts</b>		
GDP (\$ millions - current)	\$219	\$276
Labour Income (\$ millions)	\$141	\$263
Employment (Person-Years)	3,714	4,200
<b>Indirect Impacts</b>		
GDP (\$ millions - current)	\$119	\$156
Labour Income (\$ millions)	\$75	\$98
Employment (Person-Years)	1,903	2,498
<b>Induced Impacts</b>		
GDP (\$ millions - current)	\$87	\$114
Labour Income (\$ millions)	\$52	\$68
Employment (Person-Years)	1,326	1,741
<b>Total Impacts</b>		
GDP (\$ millions - current)	\$415	\$545
Labour Income (\$ millions)	\$268	\$429
Employment (Person-Years)	6,943	8,439

\* This is the figure from Glislason et al. BCF financial statements for 05/06 indicate revenues of \$436 million. Economic output figures in this table were adjusted to reflect the BC Ferries financial statement revenues of \$436 million.

According to the updated analysis, BC Ferries had a total (current) GDP of \$545 million in 2012/13, generated \$429 million in labour income, and resulted in 8,439 person-years in employment. These are estimates and should be used as a guideline only (see notes for more details).

According to this estimate, the total value-added of BC Ferries (GDP) increased 31% from 2006-2013.



## METHOD 2: “DOWNSTREAM” BUSINESS STIMULATION

Another method of estimating the impact of BC Ferries is by examining the total business revenues that are dependent on ferry travellers.

Whereas the “indirect” economic impacts identified in **Figure 11** (previous page) identifies the economic impacts of businesses that supply products and services to BC Ferries (e.g., engine machinery), the analysis below estimates the economic impacts on businesses that serve the travellers using BC Ferries.

## MODELLING PASSENGER TRAFFIC IMPACTS

One method of estimating economic impacts of BC Ferries is by assessing the travel and expenditure patterns of ferry users and estimating the impacts that these expenditures have in communities and regions that serve ferry travellers.

There is a wealth of current and reliable information on travel patterns of both residents and non-residents of British Columbia, through the Travel Survey of Residents of Canada (TSRC) <sup>xix</sup> and the International Travel Survey (ITS). <sup>xx</sup> These detail the specific activities that resident and non-resident travellers undertake while travelling in B.C. and specific regions of BC, the average travel party size, visitor origins, demographics, and other useful information for modeling social and economic impacts.

When these individuals and groups travel, they utilize services directly, such as transportation services (including but not limited to BC Ferries), recreation and entertainment services (e.g., skiing, movie theatres, sporting events), as well as accommodation services (hotels, motels, campgrounds, lodges), food and beverage services (restaurants, pubs/bars/lounges), and they purchase retail items.

In turn, these above-named “industry groups” require and purchase items to support their business operations. The most significant beneficiary (supplier) industries to the travel-related industries include those in Finance, Insurance, and Real Estate (the so-called “FIRE” industries), construction, manufacturing, energy/utilities, other transportation and warehousing.

Finally, individuals employed in the travel-related industries (transportation, recreation/entertainment, accommodation, etc.) also earn wages and salaries that are recirculated throughout local and regional economies. These expenditures are classified as “induced” economic impacts. It should be noted here that the expenditures of individuals in the “indirect” industries mentioned above (Finance, Construction, etc.) are NOT included in these economic impact calculations, as this would result in possible double-counting of impacts.

## ECONOMIC IMPACTS OF BC FERRIES TRAVELLERS

In order to estimate traveller expenditures on BC Ferries, we must first categorize them as either “tourists” (for the purposes of the analysis) or “non-tourists.”

In the past, BC Ferries has estimated that 22% of its passengers are “tourists” <sup>xxi</sup> – however, this excludes any coastal community residents, including those of the Lower Mainland. This exclusion



fundamentally and significantly under-estimates the number of tourists, as travel by BC residents constitutes approximately 63% of visitors to Vancouver Island and more than half of these are from the Lower Mainland.

## COMBINING BC STATS ESTIMATES WITH TRAVEL SURVEY DATA

B.C. Stats estimates that 92% of ferry users are classified as “tourists” because they travel at least 70 km for pleasure, business, or other purposes and outside of their normal sphere of interaction. <sup>xxiii</sup> The remaining eight per-cent (8%) of ferry travellers are estimated by BC Stats (and verified by BC Ferries) to be commuters.

The combined data from the two main travel surveys (ITS and TSRC) referenced earlier also separate travellers into “overnight” and “same day” categories, with 55% of visitors to Vancouver Island being overnight travellers, and the other 45% being same-day travellers. <sup>xxiv</sup> This helps with enhancing the accuracy of our estimates.

## ECONOMIC IMPACT CALCULATIONS – BC STATS METHODOLOGY

According to BC Stats, 92% of the 19.9 million ferry travellers in 2012/13 were tourists, and of these, current and reliable travel survey estimates identify 55% of these as being overnight travellers, while 45% were same-day travellers. We assume that each traveller takes two ferry trips on each travel event, <sup>xxv</sup> we can then be divided into domestic (Canadian), U.S., and international travellers, as summarized in **Figure 12**, (below).

**Figure 12.** BC Ferries Overnight Passenger Spending (Annual) in British Columbia – 2012/13

	Overnight Travellers	Avg. Trip Duration (# nights)	Avg. Party Size	Avg. Daily Expenditures	Total Expenditures
Domestic (Can resident) travellers	3,698,714	3.3	1.8	\$132	\$895,088,780
U.S. travellers	835,000	3.5	2.5	\$282	\$329,658,009
Other international travellers	505,818	8.7	2	\$110	\$242,033,820
<b>TOTAL</b>					<b>\$1,466,780,609</b>

As **Figure 12** shows, the majority of ferry passenger spending is attributed to Canadian residents.

**Figure 13.** BC Ferries Same-day Passenger Spending (Annual) in British Columbia – 2012/13

	# Same-day Travellers	Avg. Party Size	Avg. Daily Expenditures*	Total Expenditures
Same-day travellers	4,123,253	1.8	\$132	\$302,371,908

\* These estimates assume that all same-day passengers were residents of BC, which makes these estimates somewhat conservative.

When overnight and same-day traveller expenditures are combined, we can reliably estimate that total BC Ferries passenger spending in the BC economy is approximately \$1.8 billion per year.

**Figure 14.** Total Annual BC Ferries Passenger Spending in BC Economy

Traveller Category	Total Direct Expenditures
Overnight Traveller Expenditures	\$1,466,780,609
Same-day Traveller Expenditures	\$302,371,908
<b>TOTAL</b>	<b>\$1,769,152,516</b>

## AN ALTERNATIVE APPROACH

In developing this report, a number of community representatives and specialists in transportation economics suggested that an alternative way to measure the total ferry traveller spending in the economy would be to segment travellers by evaluating usage of the “Experience Card” and considering these travellers to be residents (non-tourists) with the non-Experience Card travellers being “tourists” for whom the travel surveys (ITS and TSRC) can be applied.

**Figure 15.** Alternative Economic Impact Calculation

	Visitors	Avg. Trip Duration (# nights)	Avg. Party Size	Avg. Daily Expenditures	Total Expenditures
Domestic (Can resident) travellers	3,865,741	3.3	1.8	\$132	\$935,509,291
U.S. travellers	872,707	3.5	2.5	\$282	\$344,544,739
Other international travellers	528,660	8.7	2	\$110	\$252,963,608
				<b>TOTAL</b>	<b>\$1,533,017,638</b>

Using non-Experience Card users as a proxy for “tourists” we get a similar, but slightly lower estimate of BC Ferry passenger expenditures in the BC economy compared with using the BC Stats traveller proportion estimates and detailed travel survey expenditure data. This method also does not capture the expenditures of the approximately 50% of users who are not Experience Card users. <sup>xxvi</sup>

However, these estimates are within the same order of magnitude, and this cross-referencing of estimates helps to validate the initial estimate (\$1.8 billion) of total direct ferry traveller expenditures in the BC economy.

## ESTIMATING OTHER SECTORAL IMPACTS OF BC FERRIES

A number of industries supply products and services directly to those businesses that would directly benefit from traveller spending in the economy. These can be estimated using input-output tables that model ferry traveller spending in the economy. <sup>xxvii</sup>



The U.S. Transportation Research Board stresses the “importance of community involvement in all steps of the impact assessment process” in order to identify the range of relevant impacts (benefits, costs, and risks) of undertaking a specific project, altering existing cost structures, or changing travel preferences. <sup>xxviii</sup>

For this reason, the industries that are the focus of this section are those for which communities expressed the greatest concern, through a survey of more than 400 community representatives as part of the initial stages of this initiative.

The main industries for which community representatives expressed the greatest concern were as follows:

- Tourism
- Construction
- Real estate
- Transportation
- Manufacturing
- Retail

## ECONOMIC IMPACTS OF BC FERRIES – INDUSTRY IMPACTS

The estimated impacts of ferry passenger spending in the entire BC economy is summarized in the table below:

**Figure 16.** Impact of Ferry Passenger Spending in BC Economy

Gross Domestic Product (GDP) - All Industries (current)	
Direct	\$751,188,565
Indirect	\$393,501,460
Induced	\$346,402,406
<b>TOTAL</b>	<b>\$1,491,092,431</b>

The total annual GDP of BC Ferries in the BC economy is estimated at \$1.5 billion (2012/13). By way of comparison, the GDP of forestry and logging in BC is \$1.6 billion in 2012, and the GDP of agriculture is \$1.2 billion. <sup>xxix</sup>

The following table provides a breakdown of select industries that are impacted by ferry traveller expenditures in the BC economy.

**Figure 17.** Direct and Total Annual GDP of Ferry Passenger Expenditures in BC

Industry Sub-totals	Direct GDP	Indirect & Induced GDP	Total GDP
Arts, Entertainment and Recreation	\$63,735,554	\$8,508,849	\$72,244,403
Accommodation Services	\$218,836,129	\$3,051,473	\$221,887,602
Food & Beverage Services	\$112,165,678	\$12,586,654	\$124,752,332
Other Transportation and Warehousing	\$97,780,842	\$37,005,762	\$134,786,604
Information and Cultural Industries	\$4,442,187	\$37,703,214	\$42,145,401
Other Finance, Insurance, and Real Estate (FIRE)	\$0	\$130,986,188	\$130,986,188
Retail Trade	\$75,500,250	\$53,042,077	\$128,542,327
Construction	\$0	\$43,882,392	\$43,882,392
Manufacturing	\$0	\$99,886,821	\$99,886,821
<b>Subtotal (select industries above)</b>	\$572,460,640	\$426,653,430	\$999,114,070
<b>TOTAL (all industries)</b>	<b>\$751,188,565</b>	<b>\$739,903,866</b>	<b>\$1,491,092,431</b>

Source: *Tourism Regional Economic Impact Model (TREIM)*

As the above table demonstrates, the majority of impacts of tourism-related industries are direct impacts, in that the GDP can be directly attributed to ferry travel spending directly in businesses within these industry groups. These impacts are accrued in industries such as Accommodation Services, Food and Beverage Services, Transportation and Warehousing, Retail, as well as Arts, Entertainment and Recreation.

However, just as notable are the indirect and induced impacts, which flow from industries that supply goods and services to businesses that directly serve ferry travellers. The largest indirect and induced economic impacts are in the Finance, Insurance and Real Estate (FIRE) industries, with approximately \$131 million in GDP impacts – all of which are indirect and induced.

Calculating a high-level gross cash-on-cash Return on Investment (ROI) analysis based on these estimates, the total government funding of \$177 million for FY 2012/13 yielded a total GDP of \$1.49 billion, resulting in a total ROI of 8.4-to-1. It should also be noted that a significant portion of this economic activity occurs outside of ferry dependent communities.

## TAX REVENUE IMPACTS

The \$1.5 billion in total annual GDP attributed to BC Ferries traveller spending in the BC economy also results in significant revenues to all three levels of government, in the form of income taxes, property taxes, other fees, licences, and payments. These are summarized right.



**Figure 18.** Annual Tax Revenue Impacts of BC Ferries <sup>xxx</sup>

Taxing Jurisdiction	Tax Revenues (\$ mil)
Federal	\$210
Provincial	\$150
Municipal	\$34.2
<b>TOTAL</b>	<b>\$394</b>

Considering the tax revenue Return on Investment (ROI) for government funding, we can estimate that the combined investments of the federal and provincial government of approximately \$177 million in 2012/13 resulted in tax revenues of \$394 million, for an estimated ROI of 2.2-to-1. This means that for every \$1.00 invested in BC Ferries by governments, they generated \$2.20 in tax revenues.

For the BC provincial government, the returns are lower, as they provide the bulk of public investments through the annual Transportation Fee, which was \$149 million in 2012/13. With tax revenues of \$150 million returned to the Province each year, this equates to a rough break-even point, or a ROI of 1-to-1.

## OTHER COMMERCIAL IMPACTS

While the above analysis focused on impacts of ferry traveller spending in the economy, another facet of economic impacts that is much harder to quantify are those impacts of increasing shipping costs on wholesale and consumer items. As noted earlier, this is beyond the scope of this report, however, initial considerations were developed, based on structured interviews with commercial transport providers and relevant sector groups.

## COMMERCIAL TRANSPORT OF GOODS

BC Ferries is a near-monopoly provider of “live load” commercial transport services in British Columbia, meaning for commercial transport shipments that are accompanied by a driver. <sup>xxxi</sup> These “live loads” are further divided into commercial transportation providers that are “less than truckloads” (LTLs) – which undertake multiple pickups and deliveries during shipments of goods – and “full truckloads” (TLs) – which only make one pickup and delivery for each shipment.

According to industry estimates, for LTL carriers, ferry travel on the main routes constitutes approximately 30-50% of total transportation costs, and increases to approximately 40-60% for minor and northern routes.

For a typical semi trailer, delivery cost is approximately \$2,000 (end-to-end), of which ferry transport is approximately \$800 (return). For TL carriers, the total shipment cost is lower (approximately \$1,300 for a typical load), of which the ferry transport remains approximately \$800 (return).

According to these same industry estimates, transportation costs are approximately 10% of the wholesale and/or retail price for most goods transported by ferry in B.C. In a “typical” hypothetical scenario of commercial fare increasing by 70% from 2003-2013, the flow-through impacts of ferry fare increases alone on end user prices would be approximately 2.8% for the major routes and 3.5% for the minor routes. While a 3-4% increase in prices over a 10-year period may not seem significant,

this increase would place downward pressure on production and consumption of a similar magnitude (3-4%) just due to ferry fare increases.

## CONSUMER PRICES

Economic theory would suggest that as transportation costs increase the prices of consumer goods across a broad spectrum would increase. With an increase in transportation costs associated with ferry travel, this should be reflected in the data.

However, it does not, at least initially, appear to be the case.

BC Stats tracks and reports consumer prices in Vancouver and Victoria, and from 2002 to April 2014, consumer prices in Vancouver increased by 19.4% whereas in Victoria they increased at a slightly slower rate, by 16.4%.<sup>xxxii</sup>

## MINOR ROUTES AND MAJOR ROUTES

In consultation with trucking sector representatives, it was noted several times that for commercial goods, ferry fare increases on the major routes doubly impact the cost of goods on minor routes, as in most cases goods must first use a major route prior to being delivered in communities served by minor routes. For commercial entities domiciled in communities served by minor routes, these goods typically will also require shipment over a major route in order to access markets. Therefore it should be noted that fare increases on the major routes also impact the prices of imported goods as well as the costs of exported goods. For the tourism sector, major routes are often a precursor to a Gulf Islands visit, so increasing major route fares to support minor route fares does not assist in reducing overall cost burden of travellers to minor routes.

## SUMMARY

BC Ferries has a large impact on the economy not just of ferry dependent communities, but of the entire province and beyond. In fact, B.C. residents outside of coastal communities are significant beneficiaries of both economic activity and tax revenues generated by users of the ferry system.

The economic impact of BC Ferries as an organization has grown to an estimated \$545 million in 2012/13, and employing over 8,400 workers (full-year equivalents), which is approximately double the organization's direct labour complement of 4,200 workers.

However, the organization's total economic impact as a facilitator of transportation of people (in particular) dwarfs its organizational economic impact. BC Ferries generates over \$1.5 billion annually in total (current) GDP – nearly three-times more than is generated just by BC Ferries as an organization. The total taxes generated by this economic activity is over \$394 million each year, based on an annual public investment of just under \$180 million, yielding a system-wide ROI of approximately 2.2-to-1.





## SECTION IV: PASSENGER SENSITIVITY ANALYSIS (CONSUMER PRICE ELASTICITY of DEMAND)

A fundamental area of interest in analyses of BC Ferries and other passenger transportation systems is the relative sensitivity of travellers to price changes. If fares increase by a certain percentage, analysts and stakeholders want to know how much they can expect demand to decrease. For example, if fares increase by 50%, will we see a 10% decrease in customer traffic? An 80% decrease?

To determine the relative sensitivity of consumers to price changes, economists use a measure known as the Price Elasticity of Demand (PED – henceforth “elasticity”). This is defined as “a measure used in economics to show the responsiveness of the quantity demanded of a good or service to a change in its price.” <sup>xxxiii</sup>

### ELASTICITY IN ITS MOST FUNDAMENTAL FORM IS EXPRESSED BY THE FOLLOWING FORMULA:

$$e(R) = \frac{dQ/Q}{dP/P}$$

Where elasticity  $e(R)$  is the ratio of the change in the quantity of goods ( $Q$ ) demanded relative to the change in prices of goods ( $P$ ). By way of a simple example, if the quantity of goods consumed decreases by 40% as a result of a 50% increase in price, then the elasticity  $e(R) = -0.4 / 0.5 = -0.8$ .

Elasticity is typically negative, indicating that an increase in price almost always results in a decrease in consumption. Across the entire economy, the elasticity is “-1”. In other words, when prices increase by 10%, all things equal, consumption will decrease by 10%.

Fortunately, numerous studies have been conducted on the elasticity of transportation, ferry travel, and for BC Ferries, itself. Unfortunately, these analyses have highly divergent results. However, with updated ferry passenger and pricing information, we can reasonably estimate the elasticity of the ferry system, route groups, and individual routes.

### PRIOR PRICE ELASTICITY STUDIES

There are a number of elasticity studies that have been conducted regarding ferry transportation, and BC Ferries in particular. Some of the more notable ones are listed in Figure 19 (below).

These reports have highly divergent findings. The Pritchard study would suggest that if fares increased

**Figure 19.** Ferry Elasticity Studies

Author	Ferry System / Date	Elasticity
Mark Pritchard, Arizona State University <sup>xxxiv</sup>	BC Ferries	-2.24 (price increase) -3.01 (price decrease)
Michael D. Bennion <sup>xxxv</sup>	Washington State Ferries, 2010	-0.40
InterVISTAS Consulting <sup>xxxvi</sup>	BC Ferries, 2010	Majors: -0.28 Minors: -0.12 Northern: -0.56

10%, we would witness a 30% ridership decline. The InterVISTAS report suggests that if fares on the Major Routes were to increase by 10%, ridership would decline by approximately 3%.



Of the three reports cited above, only the InterVISTAS report actually undertook data modelling based on actual ferry passenger volume changes relative to prices, which is generally considered a more reliable method than consumer surveys, which were used for the Pritchard and Bennion studies. For this reason, it will be used as a comparative benchmark for the updated analyses.

## ESTIMATING FERRY ELASTICITIES (2003-2013)

This report calculates updated elasticity estimates for BC Ferries, using data from 2003-2013.<sup>xxxvii</sup> With the addition of three years of data since the most recent elasticity estimates, some trends are becoming evident that may not have been apparent in the past.

**Figure 20.** Price Elasticity of Demand of BC Ferries, 2003-2013

Route Group	Average Elasticity ('03-'13)
Majors	-0.85
Minors	-0.30
Northern	-0.59

Returning to the example used above, we can estimate that a 10% fare increase would, all things equal, result in an 8.5% ridership decline on the Major Routes, a 3% ridership decline on the Minor Routes, and a 5.9% ridership decline on the Northern Routes, when adjusted for inflation and income.<sup>xxxviii</sup>

Econometricians “adjust” figures by taking into account changes in the prices of goods and overall wealth in an economy. For example, a chocolate bar that cost 15 cents in 1970 may cost \$1.40 in 2014, but when you account for inflation and overall increases in wealth, in real terms for consumers, a chocolate bar may actually seem less expensive today than in 1970. By not adjusting the data, historical trend analysis is almost meaningless.

Perhaps the most surprising finding is with regard to the Major Route Group. The common understanding (and misconception) of the Major Routes is that its users are less price sensitive, as these routes have not witnessed as significant a ridership decline as the Minor Routes and particularly the Northern Routes. However, the Major Route Group prices have not increased nearly as much as for the Minor and Northern groups, and when adjusting for inflation (CPI) and Gross Domestic Product (GDP), nearly all the price increases were eliminated from the elasticity equation. As a result, the elasticity was estimated to be much more significant than is commonly understood.

The Minor Route Group elasticity increased (became more negative) compared with the 2011 estimate, due to a combination of sharp ridership declines in recent years even with more modest relative price increases. Interestingly, the Northern Route Group elasticity estimate is nearly equal to that estimated in 2011, at -0.59.

**Figure 21.** Elasticity of demand of BC Ferries service fares and demand volumes, 2003-2013 (year over year)

	2004/05	2005/06	2006/07	2007/08	2008/09
<b>Route</b>					
Majors	1.185146785	-0.292899519	0.058360722	0.470713271	-0.226456931
Minors	0.810155084	-0.258433846	-0.398379302	-0.767281577	0.114718202
Northern	0.524227414	-1.743556504	-0.684212052	-0.606672706	0.139875495
<b>Individual routes</b>					
10	-0.459108557	0.07455643	-12.11326089	15.98669174	-0.37211229
22	-0.522682338	-1.407971935	-0.05101587	-1.547028303	-0.349974077
23	-0.032426182	-0.333973257	-0.269435045	-0.509404346	-0.247346469
19	0.458837072	-0.870074426	-0.938885248	-0.333502054	-0.218150991
5	0.272309384	0.756807306	-0.191447273	-0.025672784	-0.210798047
1	-4.602941102	-4.707044784	-0.697212321	3.141866492	-0.365193313
7	3.913302222	1.793004544	-0.627650576	0.129695549	-0.26859354

	2009/10	2010/11	2011/12	2012/13	2003/2013
<b>Route</b>					
Majors	0.287413122	-0.047545077	-0.698792326	-0.164379119	-0.846845432
Minors	-0.588487409	0.152723529	-1.01523601	0.306182716	-0.296737059
Northern	-2.870573906	0.264998157	-1.995173449	0.457778178	-0.592333323
<b>Individual routes</b>					
10	-1.01940292	-0.170090548	-2.143910741	-1.296339899	-1.235803898
22	0.93000294	-0.446680478	-1.900350601	-1.594751192	-0.908015933
23	0.133344228	-0.74006729	-1.064810133	-0.827452005	-0.671115324
19	0.287541484	-0.873686471	-2.008034466	-0.240048454	-0.68607354
5	0.311467385	-0.943862731	-0.856208826	-0.512883873	-0.447506391
1	0.383915422	-0.007350723	4.415644593	-0.31859399	-1.100442728
7	0.202843297	-0.594040764	-1.27900374	-0.714078259	-0.450339992

\*accounting for CPI and GDP



## WHAT OTHER FACTORS IMPACT PASSENGER VOLUMES?

A variety of factors impact passenger volumes on BC Ferries: the state of the BC (and global) economy, population changes in BC and for each ferry dependent community, alternative transportation options, and others.

Statisticians and econometricians are able to identify which factors are more closely inter-related than others, using multiple regression analysis. While regression analysis does not provide irrefutable evidence of a causal relationship, the relative strength of correlated variables gives us great insight into whether these relationships are merely coincidental or whether they are directly inter-related, and perhaps causal relationships.

**Figure 22.** Correlation Coefficients (Price:Demand) – by Route Group and Select Routes

Route	Price-demand correlation R (nominal)	Price-demand correlation R (CPI and GDP adjusted)
All routes	-0.85	-0.84
Majors	-0.70	-0.65
Minors	-0.88	-0.79
Northern	-0.92	-0.84
Route 10 (Port Hardy to Prince Rupert)	-0.67	-0.53
Route 22 (Denman to Hornby Island)	-0.94	-0.86
Route 23 (Campbell River to Quadra Isl)	-0.96	-0.89
Route 19 (Nanaimo to Gabriola Isl)	-0.96	-0.85
Route 5 (Swartz Bay to Southern Gulf Isl)	-0.85	-0.82
Route 1 (Swartz Bay to Tsawwassen)	-0.81	-0.72
Route 7 (Sunshine Coast to Powell River)	-0.76	-0.81

## INITIAL FINDINGS – FERRY FARES AND PASSENGER VOLUMES

To determine the degree to which ferry fares may be impacting ridership, a number of variables were tested against ferry ridership levels.

The first was passenger fares, which produced the following correlation coefficients (R-values).

The correlation coefficient is a measure of the correlation (dependence) between two variables, and have values between 1 (perfect positive correlation) and -1 (perfect negative correlation).

**Figure 22** demonstrates that for all routes and route groups examined, as fares increased, passenger volumes decreased.

To test the relative strength of these relationships, we can calculate further regression statistics, as summarized below.

**Figure 23.** Regression Statistics for Fares: Passenger Demand

Regression Statistics	
Multiple R	0.85
R Square	0.73
Adjusted R Square	0.70
Standard Error	384613.9431
Observations	11

The notable statistic is the “R Square,” which, with a value of 0.73, is interpreted as meaning “73% of the variation in passenger volumes can be explained by variation in ferry prices.”

In a statistical sense, this is considered a relatively strong correlation between fares and prices, but it is far from a “perfect” linear relationship. In some years, fares increased while ridership decreased, and vice versa. Therefore, other factors must be at play.

### Fares, Population, and GDP

The strength of the correlation can be increased significantly when other factors are taken into consideration, particularly population and GDP (for British Columbia).

When these variables are combined, the following regression statistics are produced:

**Figure 24.** Fares, Population and GDP: Passenger Volumes

Regression Statistics	
Multiple R	0.947642838
R Square	0.898026949
Adjusted R Square	0.854324212
Standard Error	267701.3483
Observations	11

These results demonstrate a much stronger correlation between the explanatory variables (ferry fares, population, GDP), and the outcome (passenger volumes). In this case, we can say that 90% of the variation in passenger volumes can be explained by the variation in ferry fares, population, and GDP. Put another way, at any point in history we can estimate passenger volumes to within 10% if we know the passenger fares, population, and GDP for British Columbia.

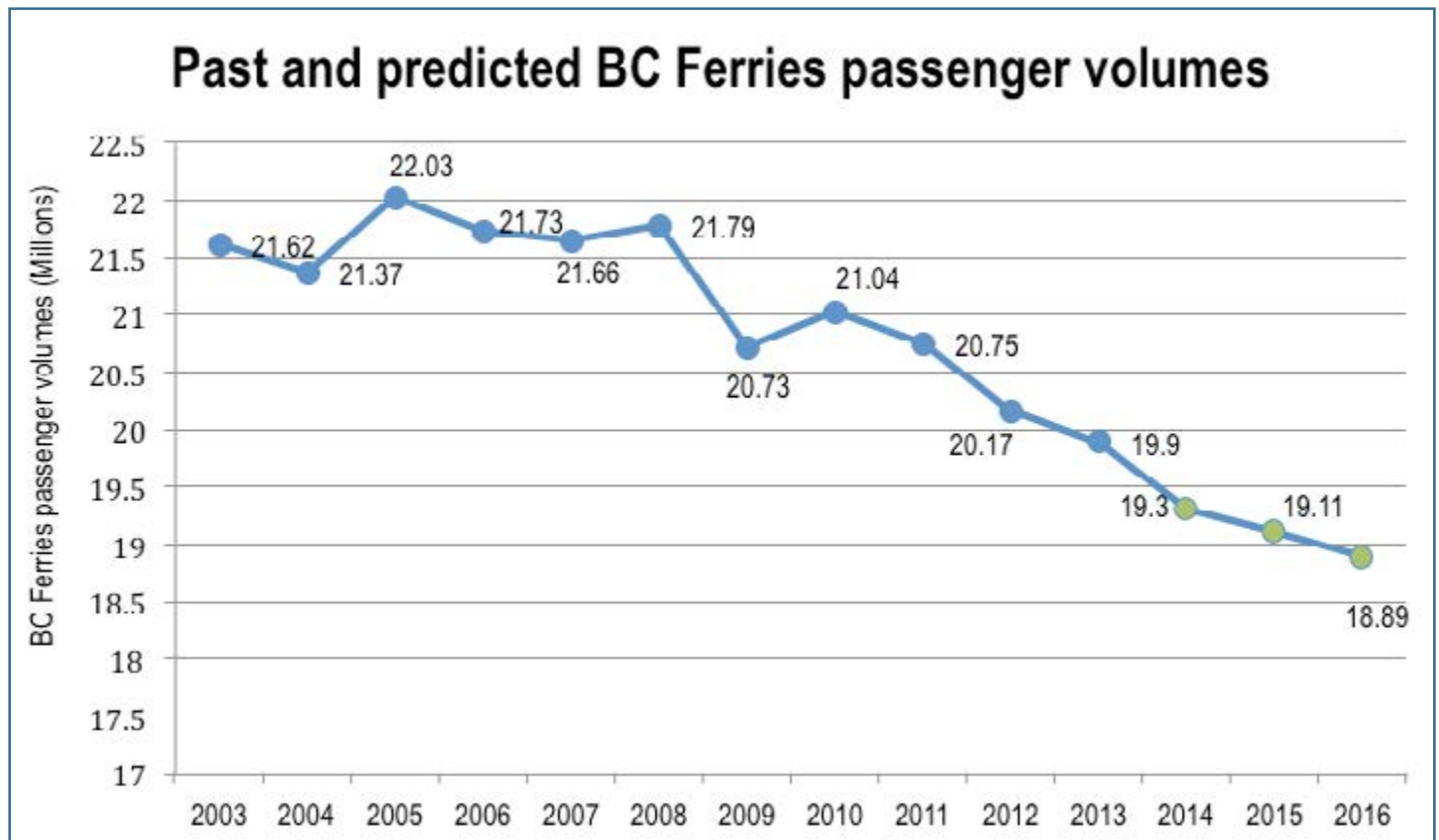
Similar tests were run with other variables, such as employment rates, inbound tourism visitation and spending, but these did not yield correlations that were as strong.

### USING REGRESSION ANALYSIS TO PREDICT FUTURE RIDERSHIP

We can use the same regression analysis to predict future trends in passenger volumes, provided that we know or can accurately estimate future prices, population levels, and GDP levels. <sup>xxxix</sup>



Figure 25. Ferry Passenger Volume Prediction



An interesting observation from **Figure 25** is that it correctly predicted further ridership declines for the 2013/14 fiscal year based on the prior trends in fares, population, and GDP. However, the model predicted a slightly sharper drop-off in passenger demand than actually occurred in 2013/14, though it was only “off” by 1.5%.

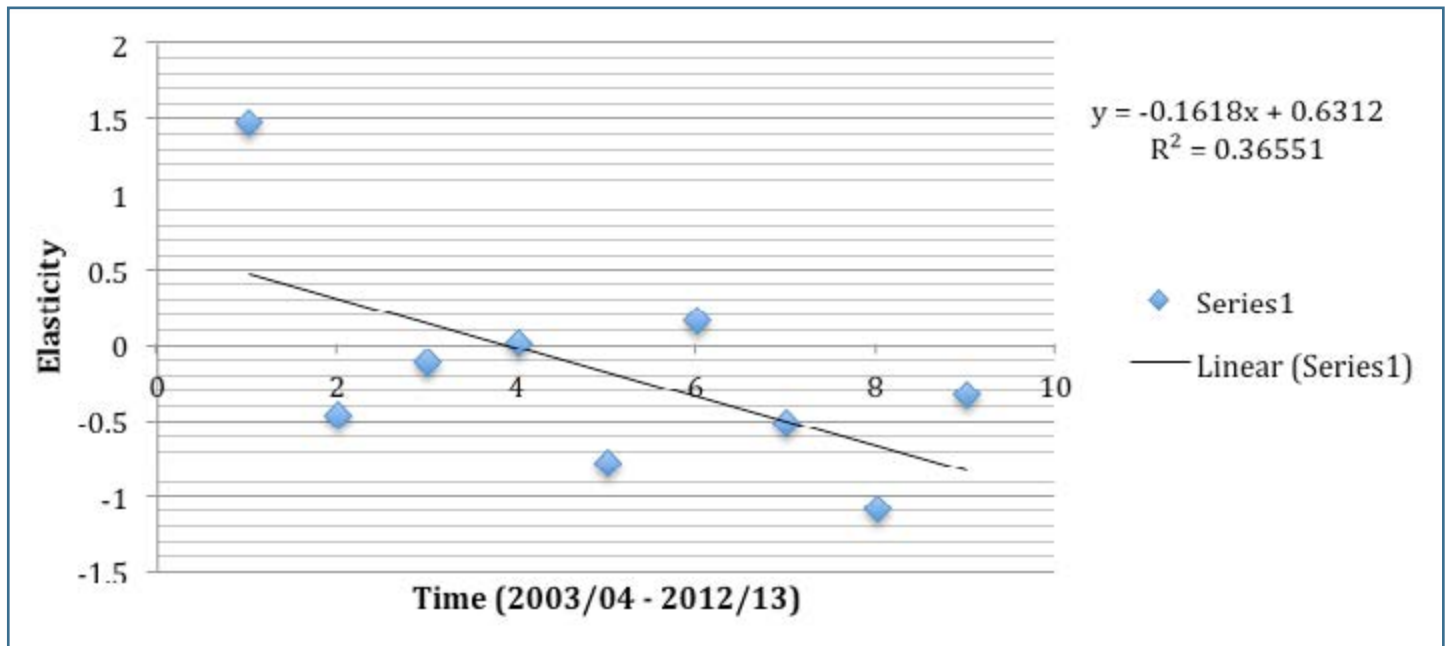
### FARE-TO-DEMAND CHANGES OVER TIME: TIPPING POINT?

Another area of interest to coastal community stakeholders is whether we may be at a “tipping point” for ferry fares, wherein future price increases begin to have an increasingly significant impact on ridership.

This can be assessed by plotting the elasticity levels (sensitivity of consumers to price increase) of the system over time, and determining whether they are increasing or decreasing.

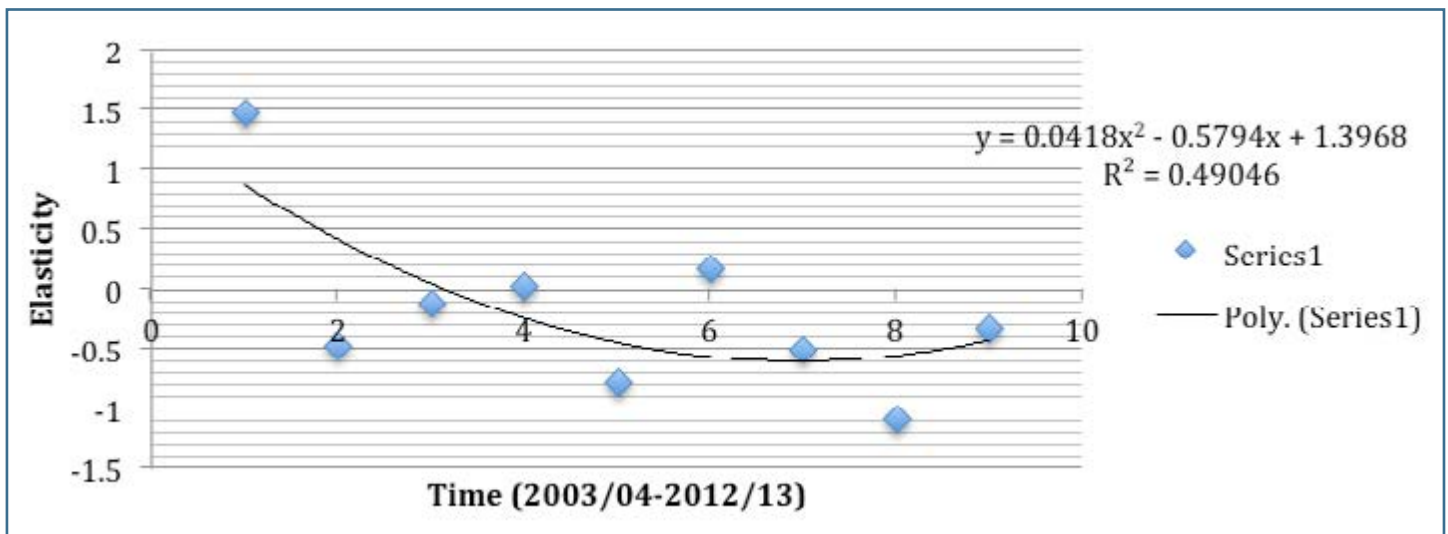
Generally speaking, elasticity rates have been increasing over time, meaning the system is becoming more price sensitive, all things being equal. When plotted as a simple linear relationship (**Figure 26**) it can be seen that the elasticity is increasing (becoming more NEGATIVE) over time.

Figure 26. Linear Elasticity Analysis – Fares: Demand



To further assess the changing sensitivity of consumers to price changes over time, econometricians often use logarithmic functions to apply a curvilinear line of best fit over the data points to indicate rates of change in data over time. In this case, using all years from 2003-2013 the rate of change (an upward sloping line) seems to suggest that while demand elasticity is increasing overall, the rate of change suggests that ferry travellers were becoming increasingly price sensitive in earlier years, and more recently have become less price sensitive. However, this trend appears to be due to the

Figure 27. Curvilinear Elasticity (Fares: Demand) 2003/04 - 2012/13



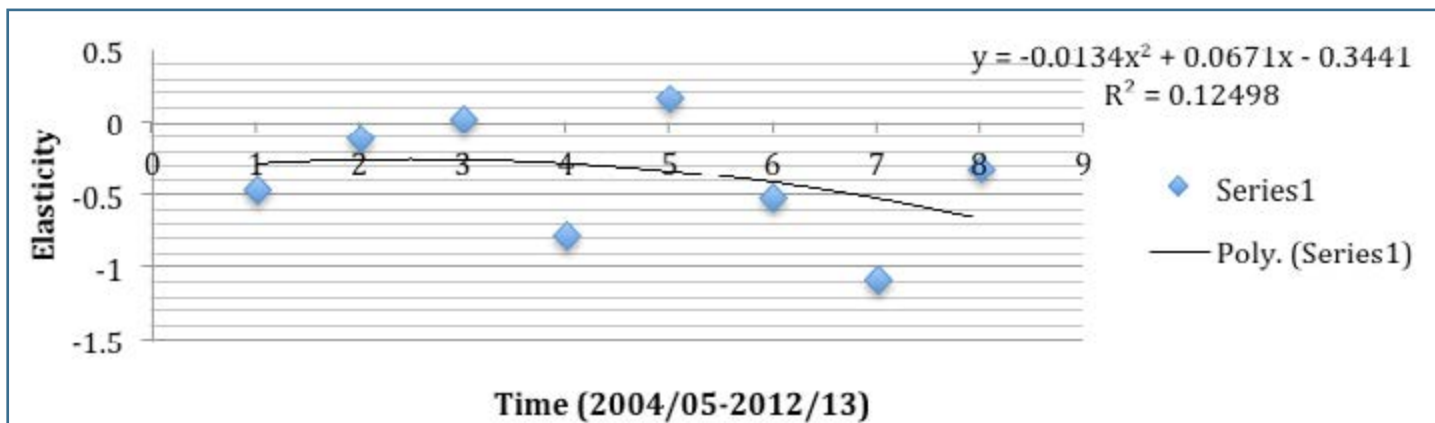
highly inelastic results from 2004/05 fiscal, in which fares increased and yet passenger volumes also increased. Accounting for some lag-time impacts of increasing fares, when the same results are plotted from 2004/05 onward, the curvilinear elasticity trend increases (becomes more negative) over





time, as would be expected. This means that ferry users have actually become slightly more price sensitive over time and after successive fare increases, as one would expect.

**Figure 28.** Curvilinear Elasticity (Fares: Demand) 2004/05 – 2012/13

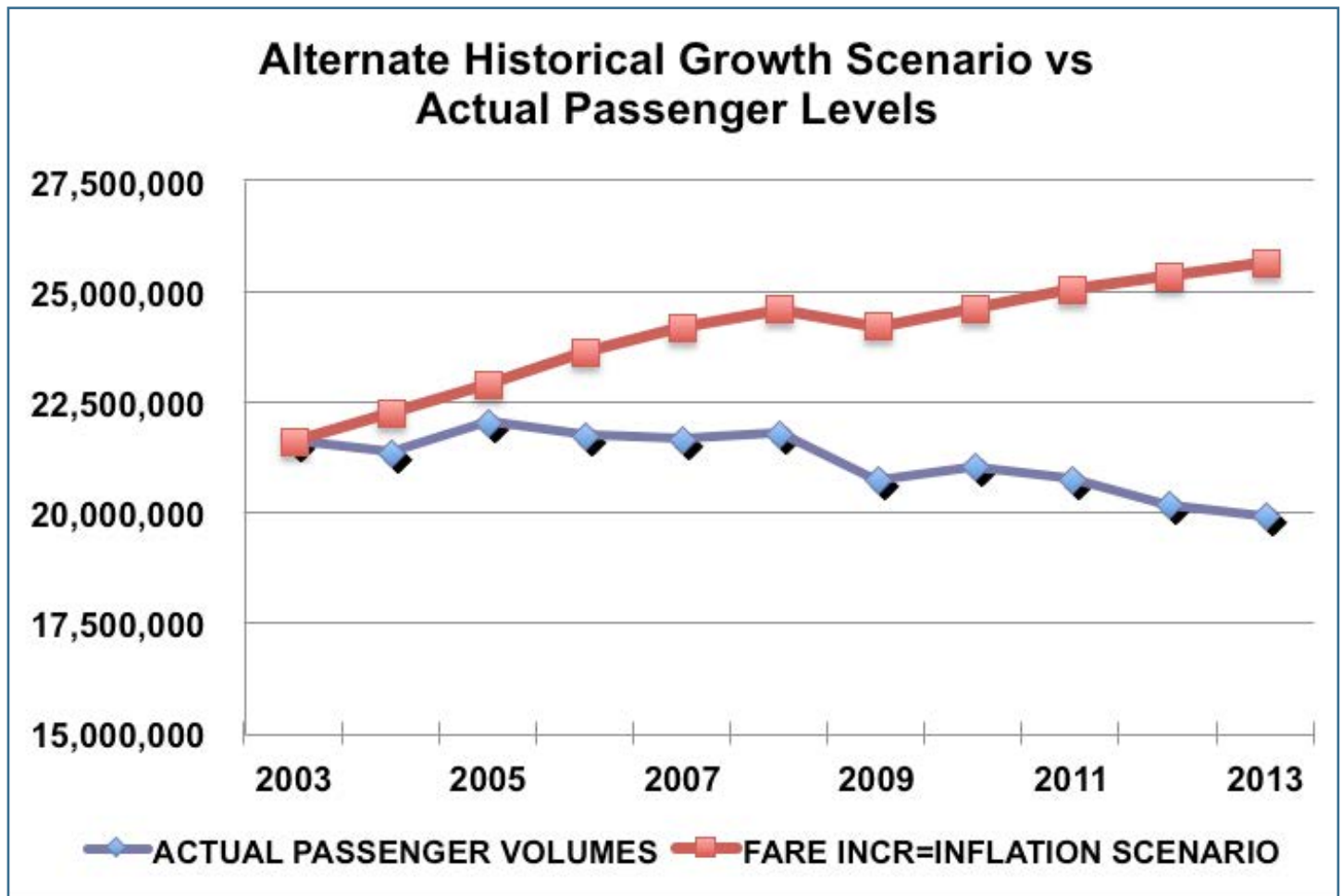


It should be noted that overall, the downward trend in elasticity is very slight. When assessing the data, one trend became quite apparent, which could explain this lower than expected elasticity change over time. Experience Card use by coastal community residents has increased overall since its inception and is only now starting to flatline and decrease slightly. On the other hand, cash paying customers, who are more likely to be discretionary travellers, have declined substantially as a proportion of overall travellers.

### PREDICTING “WHAT MIGHT HAVE HAPPENED” – THE COUNTERFACTUAL CASE

Another helpful tool of regression analysis is to predict what could have happened in an alternate situation, given different circumstances. While there always remains some uncertainty with data modeling, “predicting” scenarios that might have happened in the past has the benefit of using trends and patterns that already occurred, increasing the reliability of estimates. In **Figure 27** (next page) we use the same formula to estimate passenger volumes if fare increases had been set to the rate of inflation from 2003-2013.



**Figure 29.** Passenger Volumes - Historical Fares set to Inflation Scenario vs Actual

As **Figure 29** shows, if overall ferry fares had increased at the rate of inflation from 2003-2013, which averaged approximately 1.5% per year over the period, the model predicts that passenger volumes would have increased from 21.6 million to approximately 25.7 million annual passengers, a differential of 28.8% above the actual of 19.9 million.

While this potential growth from 2003-2013 may seem implausible in light of the actual experience of ridership declines, it should be noted that this growth represents only an 18.7% increase over ten years. This is lower than the passenger growth rate for BC's two largest airports (YVR and YYJ), which grew at 23% and 32%, respectively over that period. It is also roughly equal to the average highway travel (vehicle-only) growth over the period, but somewhat higher than BC's population growth (11%) over the period.

### ASSESSING FOREGONE OPPORTUNITIES

Under the above scenario where rates were tied to inflation, ridership increases from 21.6 million in 2003 to 25.7 million in 2013 **Figure 30** (right).



**Figure 30.** Potential Ridership Loss

Year	Ridership Difference (Reduced Fare Scenario Minus Actual Ridership)
2003	-4,178
2004	904,788
2005	873,700
2006	1,910,414
2007	2,543,493
2008	2,809,764
2009	3,484,475
2010	3,579,153
2011	4,294,572
2012	5,197,156
2013	5,740,043
<b>TOTAL:</b>	<b>31,333,380</b>

From 2003-2013 we estimate that more than 31 million fewer passengers travelled on BC Ferries than otherwise would have, in a scenario in which fare increases were held to the rate of inflation.

Of these 31 million passengers, some would not have travelled at all, including business and pleasure travellers. A proportion of these 31 million travellers would have opted for another BC-based destination, while others would have chosen another destination outside British Columbia altogether. Estimating these hypothetical decisions is beyond the scope of this analysis, and, accordingly, the economic impact estimates that follow should be considered gross estimates.

Applying the same economic impact methodology as in Section III of this report, we arrive at the following potential ridership losses related to not constraining fare rate growth to the rate of inflation from 2003-2013.

**Figure 31.** Estimated Traveller Expenditures Lost to Fare Increases (overnight travellers)

	Overnight Travellers	Avg. Trip Duration (# nights)	Avg. Party Size	Avg. Daily Expenditures	Total Expenditures
Domestic (Can resident) travellers	5,818,196	3.3	1.8	\$132	\$1,408,003,339
U.S. travellers	1,313,482	3.5	2.5	\$282	\$518,562,614
Other international travellers	795,668	8.7	2.0	\$110	\$380,726,957
<b>OVERNIGHT TOTAL</b>					<b>\$2,307,292,910</b>

**Figure 32.** Estimated Traveller Expenditures Lost to Fare Increases (same-day travellers)

	Same-day Travellers	Avg. Party Size	Avg. Daily Expenditures	Same-Day Traveller Total Expenditures
Total same-day travellers	6,486,010	1.8	\$132	<b>\$475,640,702</b>

**Figure 33.** Estimated Traveller Expenditures Lost to Fare Increases (Total)

Overnight Traveller Expenditures	\$2,307,292,910
Same-day Traveller Expenditures	\$476,640,702
<b>TOTAL</b>	<b>\$2,782,933,613</b>

As **Figure 33** (above) demonstrates, estimated foregone ferry passenger expenditures were \$2.8 billion from 2003-2013. This is the direct revenue that could have accrued to businesses had ferry fare increases been limited to the rate of inflation, using our regression model of passenger trends.

### ASSESSING INDIRECT AND INDUCED LOSSES

Once the total direct expenditures are known, the Direct, Indirect, and Induced GDP can be calculated, as well as the total taxation impacts.



**Figure 34.** Direct and Total GDP of Unrealized Ferry Passenger Expenditures in BC <sup>xl</sup>

Industry Group	Direct GDP	Indirect & Induced GDP	Total GDP
Arts, Entertainment and Recreation	\$104,694,308	\$13,056,661	\$117,750,969
Accommodation Services	\$328,578,975	\$4,716,957	\$333,295,931
Food & Beverage Services	\$176,658,372	\$19,430,623	\$196,088,995
Other Transportation and Warehousing	\$133,064,994	\$54,703,517	\$187,768,511
<b>Information and Cultural Industries</b>	\$7,467,178	\$58,488,914	\$65,956,092
Other Finance, Insurance, Real Estate	\$0	\$202,793,884	\$202,793,884
Retail Trade	\$128,132,000	\$82,270,016	\$210,402,016
Construction	\$0	\$67,328,127	\$67,328,127
Manufacturing	\$0	\$160,933,040	\$160,933,040
Wholesale Trade	\$0	\$112,556,207	\$112,556,207
<b>Subtotal (select industries above)</b>	<b>\$878,595,825</b>	<b>\$776,277,945</b>	<b>\$1,654,873,769</b>
<b>TOTAL (all industries)</b>	<b>\$1,226,066,971</b>	<b>\$1,083,283,942</b>	<b>\$2,309,350,913</b>

Source: Tourism Regional Economic Impact Model (TREIM)

The estimated total unrealized GDP is approximately \$2.3 billion, with a nearly equal split between direct GDP and indirect/induced GDP.

## UNREALIZED TAXATION IMPACTS

We can also estimate the total unrealized taxes (gross) if fare increases had been kept at the rate of inflation from 2003-2013.

**Figure 35.** Unrealized Taxes (2003-2013)

Tax Jurisdiction	Tax Revenues (\$ mil)
Federal	\$325
Provincial	\$231
Municipal	\$53.0
<b>TOTAL</b>	<b>\$609</b>

As **Figure 35** demonstrates, it is estimated that over \$600 million in taxes were foregone when compared with a scenario in which ferry fare increases had been kept at the rate of inflation from 2003-2013.

## SECTION V: SOCIOECONOMIC IMPACT ANALYSIS

Socioeconomic impacts are any changes in social or economic outcomes in a defined area that can be traced to a specific policy, event, organizational change, or other factors in a defined unit of analysis. In socioeconomic impact analysis, factors that are typically addressed are changes in income, economic stability, measures of “social cohesion,” health, education, or essentially any factor that is deemed to be of social and/or economic importance.

In light of the diversity of possible areas of focus, the U.S. Transportation Research Board stresses the “importance of community involvement in all steps of the impact assessment process” in order to identify the range of relevant impacts (benefits, costs, and risks) of undertaking a specific project, altering existing cost structures, or changing travel preferences. <sup>xli</sup>

In a Spring 2014 survey of more than 400 coastal community stakeholders from local government, business, transportation, and other groups, the top priorities for analysis were identified. These included:

- Business formations and failures
- Housing starts, values, and sales
- Employment
- Population changes

For the above measures, the post-2009 period is also examined separately from the 2003-2013 period in order to highlight issues related to “economic resilience” – i.e. how well these communities have recovered from the global financial crisis of 2008/09. In order to measure the above, three distinct but complementary methodologies are employed:

1. Longitudinal (historical) trend analysis – do outcomes change over time, particularly after more significant fare increases and ridership declines?
2. Statistical (regression) analysis – are there strong statistical correlations between ridership declines and socioeconomic outcomes?
3. Comparative analysis – do outcomes in coastal (ferry dependent) communities differ from those in non-coastal communities?

For the purposes of this analysis, “coastal” typically does not include the Lower Mainland, because while the Lower Mainland is impacted by ferry activity, these are not “ferry dependent” to the same extent as other communities for whom ferries are the primary linkage.

Due to a lack of available data and limitation of resources, a number of “social” measures are not able to be assessed in this analysis, including those identified by the OECD as core measures of “social cohesion,” including “trust in institutions,” “solidarity,” “political participation,” socio-cultural participation,” “formal relations” and “substantive relations.” <sup>xliii</sup>



## BUSINESS FORMATIONS AND FAILURES

We begin by assessing leading economic indicators (business incorporations, property sales, and housing starts) and their relationship with ferry fares strengthens.

One of the most notable trends is with regard to total business incorporations, which accounts for both business formations and failures.

As **Figure 36** (below) demonstrates, the rate of change in business incorporations in coastal regions and non-coastal regions was similar from 1993-2002 in British Columbia (coastal regions lost 8.1% of their businesses, non-coastal regions lost 8.6% of their businesses).

However, from 2003 onward, non-coastal region business incorporations grew by 44.6%, just slightly higher than for coastal regions in the same period (31.1%). Perhaps more concerning, since 2009 business incorporations in non-coastal regions have increased at nearly 3-times the rate of that in coastal regions, at 23.8% for non-coastal communities versus only 8.4% in coastal communities over the four years from 2009-2013.

**Figure 36.** British Columbia Incorporations by Development Region

	1993-2002	2003-2013	2009-2013
<b>COASTAL</b>			
Vancouver Island/Coast DR	-6.1%	29.9%	7.2%
North Coast DR	-48.1%	71.4%	55.3%
<b>TOTAL COASTAL</b>	<b>-8.1%</b>	<b>31.1%</b>	<b>8.4%</b>
<b>NON-COASTAL</b>			
Nechako DR	-32.0%	37.4%	88.9%
Mainland Southwest DR	-7.0%	43.7%	24.9%
Thompson/Okanagan DR	-17.5%	46.6%	12.4%
Kootenay DR	-17.7%	25.2%	-6.7%
Cariboo DR	-31.2%	73.5%	35.7%
Northeast DR	50.3%	79.4%	59.6%
<b>TOTAL NON-COASTAL</b>	<b>-8.6%</b>	<b>44.6%</b>	<b>23.8%</b>

Source: BC Stats. <sup>xliii</sup>

This emerging trend is one that should be watched very carefully, as the ability to attract new businesses and maintain existing businesses in a post-recessionary environment is a key indicator of economic resilience.

## RESIDENTIAL REAL ESTATE PRICES

Residential real estate in British Columbia is one of the most important economic drivers, as the majority of the wealth of Canadians is in real estate. And in addition to individual wealth, construction and real estate (including finance and insurance) are immense industrial sectors in the economy, in terms of economic impact and employment.

**Figure 37.** Residential Real Estate Prices (2003-2013)

Coastal Communities	2003	2005	2007	2009	2011	2013	Chg 2003-2013	% Chg 03-13	% Chg 09-13
Powell River	127,703	167,839	241,083	237,125	223,183	223,848	96,145	75.3%	-5.6%
Vancouver Island	169,578	235,095	311,472	316,118	326,513	314,831	145,253	85.7%	-0.4%
Victoria	280,084	379,686	466,974	476,137	498,300	480,997	200,913	71.7%	1.0%
<b>Coastal Total</b>	<b>192,455</b>	<b>260,873</b>	<b>339,843</b>	<b>343,127</b>	<b>349,332</b>	<b>339,892</b>	<b>147,437</b>	<b>76.6%</b>	<b>-0.9%</b>

Non-Coastal Communities	2003	2005	2007	2009	2011	2013	Chg 2003-2013	% Chg 03-13	% Chg 09-13
BC Northern (Cariboo)*	110,347	137,798	195,487	211,805	219,061	243,665	133,318	120.8%	15.0%
Chilliwack	169,082	228,392	299,592	296,601	296,695	301,492	132,410	78.3%	1.6%
Fraser Valley	260,360	326,312	423,761	425,796	502,562	490,433	230,073	88.4%	15.2%
Greater Vancouver	329,447	425,745	570,795	592,441	779,730	767,765	438,318	133.0%	29.6%
Kamloops	143,134	177,065	275,638	300,349	301,300	312,460	169,326	118.3%	4.0%
Kootenay	136,531	173,280	272,138	274,118	269,025	276,535	140,004	102.5%	0.9%
Northern Lights	88,624	119,449	175,818	222,294	216,470	269,791	181,167	204.4%	21.4%
Okanagan-Mainline	197,538	271,605	387,523	379,711	379,837	375,601	178,063	90.1%	-1.1%
South Okanagan	163,873	229,036	325,667	314,833	308,261	299,254	135,381	82.6%	-4.9%
<b>Non-Coastal Total</b>	<b>177,660</b>	<b>232,076</b>	<b>325,158</b>	<b>335,328</b>	<b>363,660</b>	<b>370,777</b>	<b>193,118</b>	<b>108.7%</b>	<b>10.6%</b>
<b>BC TOTAL</b>	<b>259,835</b>	<b>332,137</b>	<b>439,119</b>	<b>465,725</b>	<b>561,304</b>	<b>537,414</b>	<b>277,579</b>	<b>106.8%</b>	<b>15.4%</b>

Source: BC Stats, via Multiple Listing Service (MLS)

**Figure 37** demonstrates some notable trends with respect to residential real estate prices. In the period 2003-2013 coastal and non-coastal regions experienced significant real estate price gains, with non-coastal regions increasing by 108.7% and coastal regions increasing by a significant 76.6%.



However, the growth trend for coastal communities ends in 2009. Post-recession, the average price in all coastal regions combined has declined (in nominal terms) by 0.9% - far from a housing market crash, but notably lower than the 10.6% price increase realized by non-coastal communities in this period.

This is another trend wherein post-recession, coastal regions appear to be detached from the economic circumstances of non-coastal regions.

Property value deflation also serves to reduce the source of funding for local governments, rely on property taxes as a primary though not exclusive funding source. As **Figure 38** (below) demonstrates, the total assessed value of all properties in several coastal communities has decreased substantially, particularly from 2011 to 2014.

**Figure 38.** Total Assessed Values - Ferry Dependent Communities

Jurisdiction	Route	2006	2011	2014	Chg '06-14	Chg '11-14
Saltspring	9, 4, 6	\$2,591,433,027	\$3,198,127,473	\$2,925,767,013	12.9%	-8.5%
Pender (N&S)	9, 5	\$737,151,501	\$1,002,507,921	\$890,652,304	20.8%	-11.2%
Mayne	9, 5	\$391,957,700	\$626,794,102	\$498,377,402	27.2%	-20.5%
Galiano	9, 5	\$440,964,501	\$548,852,302	\$467,473,002	6.0%	-14.8%
Saturna	9, 5	\$172,438,711	\$258,911,003	\$221,492,103	28.4%	-14.5%
Thetis	20	\$82,405,900	\$134,066,900	\$127,462,600	54.7%	-4.9%
Gabriola	19	\$822,859,750	\$1,124,677,000	\$1,000,832,600	21.6%	-11.0%
Hornby	22	\$357,720,500	\$505,921,200	\$497,280,500	39.0%	-1.7%
Denman	21, 22	\$282,812,900	\$388,276,600	\$355,370,300	25.7%	-8.5%
Bowen	8	\$1,103,306,303	\$1,574,434,296	\$1,453,052,196	31.7%	-7.7%
Quadra	23	\$397,380,000	\$561,910,100	\$509,526,200	28.2%	-9.3%
Powell River	17	\$893,374,991	\$1,383,784,000	\$1,235,583,200	38.3%	-10.7%

Source: BC Assessment Authority

While the total assessed value of all properties increased substantially from 2006 to 2011 for all coastal communities identified above, there was a notable decline from 2011 onward for all but two communities, with an average decline in total assessed values of 8.4% from 2011 to 2014.

However, it should be noted that while there may be a pattern of declining property values in recent years in coastal communities, this trend has a low correlation with ferry fares (correlation coefficient of -0.39). We would therefore urge caution in using ferry fare increases and/or ridership declines as a primary explanatory factor for housing prices.



## HOUSING STARTS AND SALES

Two areas with much stronger correlations to ferry fares and ridership levels are housing starts and sales, two important leading economic indicators that can often be used to predict future levels of economic activity in related areas.

From 2003 to 2013 housing starts in coastal communities declined by 22%, compared with a growth of 8% in non-coastal communities. Notably, since 2009 housing starts have nearly doubled from the recessionary lows in non-coastal communities, while they have only increased by approximately 11% in coastal communities since 2009.

**Figure 39.** Housing Starts

Coastal Communities	2003	2005	2007	2009	2011	2013	2013/03
Victoria	2,008	2,058	2,579	1,034	1,642	1,685	-16.09%
Nanaimo	605	905	833	801	720	415	-31.40%
Campbell River	97	339	269	131	155	262	170.10%
Courtenay	452	713	650	245	265	131	-71.02%
Duncan	185	388	281	168	163	163	-11.89%
Parksville-Qualicum Beach	248	289	216	100	149	126	-49.19%
Port Alberni	31	83	104	41	83	40	29.03%
Powell River	17	89	35	42	19	13	-23.53%
Prince Rupert	1	4	6	1	4	2	100.00%
<b>TOTAL COASTAL</b>	<b>3,644</b>	<b>4,868</b>	<b>4,973</b>	<b>2,563</b>	<b>3,200</b>	<b>2,837</b>	<b>-22.21%</b>

Non -Coastal Communities	2003	2005	2007	2009	2011	2013	2013/03
Abbotsford	1,056	1,012	1,088	365	537	749	-29.07%
Kelowna	2,137	2,755	2,805	657	934	1,013	-52.60%
Vancouver	15,626	18,914	20,736	8,339	17,867	18,696	19.65%
Chilliwack	539	966	1,352	368	354	443	-17.81%
Kamloops	301	589	763	420	510	479	59.14%
Prince George	103	284	328	145	157	195	89.32%
Vernon	318	415	548	265	163	194	-38.99%
Cranbrook	67	187	192	106	75	82	22.39%
Dawson Creek	29	40	138	84	69	193	565.52%
Fort St. John	204	153	382	100	152	385	88.73%
Penticton	219	406	295	137	89	80	-63.47%
Quesnel	21	41	117	36	35	43	104.76%
Salmon Arm	84	154	190	62	45	62	-26.19%



Squamish	185	248	240	53	60	87	-52.97%
Summerland Dm	37	36	81	25	22	37	0.00%
Terrace	13	9	56	23	26	28	115.38%
Williams Lake	134	40	67	78	46	38	-71.64%
<b>TOTAL NON-COASTAL</b>	<b>21,073</b>	<b>26,249</b>	<b>29,378</b>	<b>11,263</b>	<b>21,141</b>	<b>22,804</b>	<b>8.21%</b>

Source: CMHC via BC Stats

Another notable point regarding housing starts is the relatively strong correlation (-0.91) between ferry fares and property sales in coastal regions.

Residential real estate sales paint a different picture from housing starts. While the correlation between ferry fares and real estate sales in coastal regions is quite strong (-0.9) there is also a strong correlation between ferry fares and real estate sales in non coastal regions (-0.84). This suggests that a broader underlying economic trend is causing this variation in housing sales – likely the availability of credit (i.e., interest rates) and overall economic conditions.

**Figure 40.** Residential Real Estate Sales

Coastal Communities	2003	2005	2007	2009	2011	2013	2013/03	2009/03
Powell River	413	421	296	263	313	283	-31.5%	7.6%
Vancouver Island	8,404	9,526	9,887	7,280	6,367	6,554	-22.0%	-10.0%
Victoria	7,551	7,947	8,403	7,660	5,773	5,691	-24.6%	-25.7%
<b>COASTAL TOTAL</b>	<b>16,368</b>	<b>17,894</b>	<b>18,586</b>	<b>15,203</b>	<b>12,453</b>	<b>12,528</b>	<b>-23.5%</b>	<b>-17.6%</b>

Non-Coastal Communities	2003	2005	2007	2009	2011	2013	2013/03	2009/03
BC Northern (Cariboo)*	3,658	5,130	5,400	3,618	3,891	4,177	14.2%	15.5%
Chilliwack	2,560	3,005	3,268	2,274	2,025	2,062	-19.5%	-9.3%
Fraser Valley	17,199	20,128	18,032	15,660	14,727	12,895	-25.0%	-17.7%
Greater Vancouver	39,022	42,222	38,978	36,257	32,936	28,985	-25.7%	-20.1%
Kamloops	2,263	3,153	3,414	2,334	2,077	2,370	4.7%	1.5%
Kootenay	2,572	3,410	3,476	2,119	1,953	2,079	-19.2%	-1.9%
Northern Lights	409	611	502	340	511	357	-12.7%	5.0%
Okanagan-Mainline	7,011	8,386	8,702	5,678	4,831	6,082	-13.3%	7.1%
South Okanagan	2,064	2,351	2,447	1,545	1,317	1,401	-32.1%	-9.3%
<b>NON-COASTAL TOTAL</b>	<b>76,758</b>	<b>88,396</b>	<b>84,219</b>	<b>69,825</b>	<b>64,268</b>	<b>60,408</b>	<b>-21.3%</b>	<b>-13.5%</b>

\* From 1998 on, BC Northern (formerly Cariboo) includes Northwest. Source: Canadian Real Estate Association and BC Real Estate via BC Stats

As **Figure 40** demonstrates, real estate sales have declined by similar amounts for coastal and non-coastal regions, whether assessing trends from 2003-2013 or from 2009-2013.

## POPULATION CHANGE

For much of recent history, BC's coastal regions have been an attractive destination for "amenity migrants" – people who relocate to areas with desirable geography, climate, culture, and other lifestyle-related factors (as opposed to relocating for strictly financial reasons).

Coastal community representatives have expressed concerns that their communities are increasingly becoming isolated and depopulated, in large part due to accessibility challenges associated with increasing costs to access their communities.

The relationship between ferry fares and population levels is complex. As **Figure 41** (below) shows, they may have some justification in being concerned about population declines and out-migration. However, these relationships are not considered to be strongly statistically significant when correlated to ferry fares and/or passenger demand.

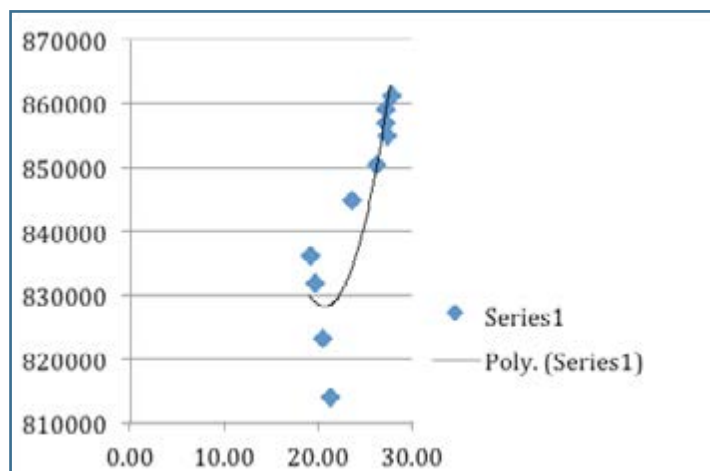
From 2003-2013, coastal community populations grew by 6.4%, whereas non-coastal communities grew at slightly less than double that rate (12.2%) over the ten-year period. Perhaps more concerning, in the four years since the 2009 global financial crisis, coastal communities have experienced little population growth (1.3%) while non-coastal communities have continued to grow at historical levels (4.5%).

When assessing the statistical validity of these relationships, however, and correlating them with ferry ridership declines, the picture becomes less clear. Over the 2003-2013 and the 2009-2013 period, there is actually a stronger correlation between ferry fares and population changes in non-coastal communities.

However, as the right-hand chart in **Figure 41** (below) demonstrates, since 2009 the correlation between fares and population becomes stronger in coastal communities. As population is typically a lagging socioeconomic indicator, the impact of historical fare increases and ridership declines may only be beginning, and should be monitored and evaluated in the coming years.

**Figure 41** .Coastal Community Correlation Analysis (Ferry Demand: Population Change)

Correlation summary (ferry demand & population change, 2003-2013)	
Coastal	Non-Coastal
-0.764781939	-0.874005921





**Figure 42** (below) summarizes population trends from 2003 – 2013 for all regional districts in BC. A notable trend is that the four regional districts with the most significant population declines were all coastal regions: Skeena Queen Charlotte (-11.5%), Central Coast (-10.9%), Mount Waddington (-9.5%), and Kitimat / Kitimat-Stikine combined (-8.6%).

This is an immensely important area of future analysis, as the ability to attract and retain populations is considered to be a key determinant of socioeconomic stability and well-being.

**Figure 42.** Population Changes 2003-2013 (Coastal and Non-coastal Regional Districts)

Regional District (Coastal/Ferry Dependent)	2003	2006	2009	2013	Chg 2003- 2013	% Chg 03-13	Chg 2009- 2013	% Chg
Alberni-Clayoquot	30,471	31,076	31,313	30,712	241	0.8%	-601	-1.9%
Capital	345,729	355,438	363,571	370,912	25,183	7.3%	7,341	2.0%
Central Coast	3,599	3,211	3,139	3,208	-391	-10.9%	69	2.2%
Comox-Strathcona*	98,921	103,089	107,214	107,580	8,659	8.8%	366	0.3%
Cowichan Valley	75,057	78,400	80,435	81,704	6,647	8.9%	1,269	1.6%
Kitimat / Kitimat-Stikine*	41,987	39,922	39,009	38,371	-3,616	-8.6%	-638	-1.6%
Mount Waddington	12,765	11,948	11,835	11,546	-1,219	-9.5%	-289	-2.4%
Nanaimo	133,552	141,211	146,321	149,244	15,692	11.7%	2,923	2.0%
Powell River	19,658	19,704	19,864	20,493	835	4.2%	629	3.2%
Skeena-Queen Charlotte	20,978	19,992	19,148	18,561	-2,417	-11.5%	-587	-3.1%
Sunshine Coast	26,450	27,921	28,528	29,017	2,567	9.7%	489	1.7%
<b>COASTAL SUB-TOTALS</b>	<b>809,167</b>	<b>831,912</b>	<b>850,377</b>	<b>861,348</b>	<b>52,181</b>	<b>6.4%</b>	<b>10,971</b>	<b>1.3%</b>

**Figure 42 cont.** Population Changes 2003-2013 (Coastal and Non-coastal Regional Districts)

Regional District (Non-Ferry Dependent)	2003	2006	2009	2013	Chg 2003-2013	% Chg 03-13	Chg 2009-2013	% Chg
Bulkley-Nechako	40,009	38,834	39,005	39,589	113	-1.0%	584	1.5%
Cariboo	64,795	63,173	63,343	62,685	-1,170	-3.3%	-658	-1.0%
Central Kootenay	57,596	56,452	58,650	58,543	2,054	1.6%	-107	-0.2%
Central Okanagan	158,324	167,323	182,172	184,595	21,492	16.6%	2,423	1.3%
Columbia-Shuswap	48,974	50,705	51,941	50,684	839	3.5%	-1,257	-2.4%
East Kootenay	56,233	56,052	58,037	56,833	1,085	1.1%	-1,204	-2.1%
Fraser Valley	253,849	266,635	278,951	287,688	24,756	13.3%	8,737	3.1%
Fraser-Fort George	97,065	94,436	93,583	94,351	-935	-2.8%	768	0.8%
Greater Vancouver	2,131,780	2,198,496	2,303,086	2,451,783	278,781	15.0%	148,697	6.5%
Kootenay-Boundary	31,744	30,814	31,713	30,523	-738	-3.8%	-1,190	-3.8%
North Okanagan	75,960	78,796	82,510	81,436	3,750	7.2%	-1,074	-1.3%
Northern Rockies	6,007	6,284	5,784	6,076	-247	1.1%	292	5.0%
Okanagan-Similkameen	77,767	80,247	82,488	80,781	1,996	3.9%	-1,707	-2.1%
Peace River	55,888	59,318	60,260	63,553	4,921	13.7%	3,293	5.5%
Squamish-Lillooet	35,385	36,639	38,074	40,344	4,519	14.0%	2,270	6.0%
Thompson-Nicola	123,394	125,575	130,705	131,166	6,970	6.3%	461	0.4%
<b>NON-COASTAL SUB-TOTAL</b>	<b>3,314,770</b>	<b>3,409,779</b>	<b>3,560,302</b>	<b>3,720,630</b>	<b>405,860</b>	<b>12.2%</b>	<b>160,328</b>	<b>4.5%</b>
<b>BC (TOTAL)</b>	<b>4,123,937</b>	<b>4,241,691</b>	<b>4,410,679</b>	<b>4,581,978</b>	<b>458,041</b>	<b>11.1%</b>	<b>171,299</b>	<b>3.9%</b>

Source: BC Stats. \* Comox-Strathcona and Kitimat/Kitimat-Stikine Regional Districts changed boundaries and hence populations in this time period, and were recombined in order to assess historical trends.

## EMPLOYMENT & UNEMPLOYMENT

Employment and unemployment levels are another area of concern for coastal stakeholders related to increasing ferry fares and declining ridership.

Once again this is another area where there is a trend, but it is not considered to be a robust statistical trend. In the years prior to ferry fare increases (from 1995-2002) the coastal unemployment rate increased by 2.0%, compared with an unemployment rate increase in non-coastal communities of 1.1%.



**Figure 43.** Unemployment & Employment Trends

	Change 1995-2002	Change 2003-2013
Coastal Unemployment Rate	+2.0%	-3.6%
Non-Coastal Unemployment Rate	+1.1%	-3.1%
Employment – Coastal	1.7%	13.2%
Employment – Non Coastal	11.3%	16.1%

Source: BC Stats

Since 2003, unemployment levels in coastal communities declined by 3.6% (from 10% to 6.4%), compared with a 3.1% decline in non-coastal communities (from 9.0% to 5.9%). However, since the recession, the unemployment rate in coastal communities has not declined as much (-2.55%) compared with non-coastal communities (-2.84%).

With (un)employment being another lagging indicator, and in light of the shifting trend since the recession, this is another area to be monitored and evaluated in the future.

**APPENDIX 1 of this report provides additional detail on eight routes and the communities they serve. This analysis has been undertaken to provide a more comprehensive understanding between ferry fares, passenger volumes and other socioeconomic considerations.**

## SECTION VI: RISK ANALYSIS

This section provides a summary of the major risks identified in this report, based on the data that was reviewed.

### **A Cautionary Note:**

This is a high-level risk analysis based on the initial assessment of data. As risk analyses have the potential to become self-fulfilling prophecies, caution should be employed with interpreting and communicating these preliminary findings.

The risks evaluated in this report are interrelated, making it difficult to isolate them and establish independent risk rankings in each category. For example, continued reductions in ferry ridership could result in business foreclosures, which in turn could reduce employment, and put downward pressure on housing prices. However, the evaluation methods (historical/trend, statistical, comparative, and economic impact) help us to determine which categories of risks are more or less likely to be related to ferry fares and ridership levels, and their severity.

Risks are typically evaluated based on the “likelihood” of a risk occurring and the “severity” of the risk, if it were to occur. Risks that are both more severe and that have a higher probability of occurring have higher overall risk scores, while the reverse holds true for risks that are lower in severity and probability.

### **OUTPUT AND OUTCOME RISKS**

There are two types of risks: “output” risks and “outcome” risks. Output risks are related to the actual outputs of the system – in this case, ridership levels. Outcome risks, on the other hand, describe the downstream impacts that could result from changes in the ferry system, such as population migration, housing prices, and other outcomes.

These are summarized in **Figure 44** (right).



**Figure 44.** Ferry System Risks

Output Risks			
Risk	Low	Moderate	High
Significant Northern and Minor Route ridership declines		•	
Significant Major Route ridership declines		•	
Outcome Risks			
Risk	Low	Moderate	High
Fewer business incorporations			•
Reduced housing starts			•
Population declines		•	
Residential real estate price declines		•	
Unemployment rate increases	•		
Inflation increases	•		
Residential real estate sales declines	•		

With regard to Output Risks, ferry ridership has declined substantially on the Northern Routes and slightly less on the Minor routes. Mounting capital costs will continue to put upward pressure on fares, though the Northern and Minor Routes are less likely to witness future fare increases and ridership declines as severe as in recent years, particularly with the recent amendments to the *Coastal Ferry Act* that mandate a single fare rate change for all route groups. The apparent high price sensitivity of Major Route passengers also suggests that ridership could continue to stagnate or even decline more rapidly in the future on these routes.

Accordingly, in the present context and based on the initial projections to 2016, it is expected that ridership will continue to decline, albeit not dramatically. However, much of this will depend on the trends in the provincial economy, population migration, and the evolution of ferry user price sensitivity.

Regarding Outcome Risks, business incorporations and housing starts are considered the highest risks, due to strong historical, comparative, and statistical evidence suggesting that they are highly correlated with ferry fare increases and ridership declines.

Population declines were given a moderate risk score, despite having a lower correlation with ferry fares and ridership, because more current trends suggest that this relationship is strengthening, and population declines can have enormous impacts on the social and economic fabric of communities.

Real estate prices were similarly given a moderate risk score, due to the fact that more recent trends suggest a downturn in coastal communities that is not present in the majority of non-coastal communities. However, real estate prices in some other rural regions of British Columbia have also stagnated or declined post-recession, suggesting that ferry fares and ridership may only have a modest impact on real estate prices in coastal communities.



Notably, employment levels do not appear to be related to ferry fares nor ridership levels, despite the fact that business incorporations have already shown signs of weakness. As a lagging indicator, it is possible that employment could begin to turn downward, but to date it has not shown any signs of doing so.

Real estate sales volumes in coastal communities may continue to be lower than the provincial average, but unless this results in price impacts, the overall effects may not be as severe. In addition, to date there is limited evidence regarding the impact of ferry ridership declines and real estate sales volumes. In real estate market cycles, sales typically lead prices, but in the case of coastal communities the reverse seems to hold true, suggesting that other factors (interest rates, availability of credit, population, inventory) may be responsible for these mixed outcomes.

Finally, widespread inflation could be highly damaging to coastal communities, but there is little or no evidence of inflation being correlated with ferry fares nor ridership levels.



## SECTION VII: CONCLUSION

This initial analysis of the socioeconomic impact of BC Ferries has demonstrated that there are reasonable grounds to conclude that increases in ferry fares have had an impact on ridership throughout the ferry system, including the Major, Minor, and Northern Route Groups. Overall, most routes display moderate consumer price sensitivity (price elasticity of demand), and this appears to be increasing over time, albeit slowly.

The analysis also concludes that the economic impact of BC Ferries on coastal communities and the overall BC economy is enormous. When measured by the amount of economic activity generated by businesses that directly and indirectly benefit from ferry traveller spending in the economy, BC Ferries is shown to be a critical element of BC's transportation infrastructure that impacts the very fabric of coastal communities and the province overall. Measured this way, the total GDP of BC Ferries is estimated at \$1.5 billion per year, and contributing an estimated \$394 million annually in taxes to the federal, provincial, and local governments.

The sheer magnitude of the ferry system means that its management has significant implications far beyond just coastal communities. As one of the largest marine passenger transportation systems in the world, BC Ferries has impacts on every community in the province.

While this is an initial scoping analysis, we are confident that the results are accurate beyond an order of magnitude level. Refinement of these initial findings should be undertaken, using primary data where available, and using complementary but alternate methodologies for estimating economic impacts, elasticity, and downstream socioeconomic impacts.

One notable finding in this study was the apparent disjuncture between the typically negative public opinion regarding BC Ferries, and the organization's strong operational performance relative to its competitors around the world. One way to bridge this divide may be to develop a stakeholder survey to be conducted in concert with the annual customer satisfaction survey, to gauge and better manage stakeholder opinions regarding the organization's performance.

As the economic impact section of this report has indicated, the true value of BC Ferries extends far beyond its role as a business, as it facilitates economic activity in all facets of the economy. Managing the organization using private sector yield management and cost recovery approaches may maximize the organizational bottom line, but could result in foregone opportunities to stimulate economic activity and enhance government tax revenues.

The recent amendment of the Coastal Ferry Act in 2012 to better clarify and address the interests of ferry users is a positive outcome that may help to moderate fare increases in the future. This analysis may help to further clarify the value and impacts of fares on ridership and the overall health and vitality of coastal communities.

## APPENDIX 1: CASE STUDIES

This section provides additional detail on a selection of specific routes and the communities they serve, in order to develop a more comprehensive understanding of the relationship between ferry fares, passenger volumes, and other socioeconomic considerations.

A broad cross-section of routes was chosen, including Major Routes, Minor Routes, and Northern Routes. Some routes have experienced significant passenger declines and related socioeconomic challenges, while others have had more positive experiences.

The routes reviewed in this analysis are:

- Route 7 – Sunshine Coast to Powell River (Earls Cove to Saltery Bay)
- Route 1- Swartz Bay to Tsawwassen
- Route 10 - Inside Passage - Port Hardy to Prince Rupert
- Route 22 – Denman Island to Hornby Island
- Route 23 – Campbell River to Quadra Island
- Route 19 – Nanaimo to Gabriola Island
- Route 5 – Swartz Bay to Southern Gulf Islands (Galiano, Mayne, Pender, Saturna)
- Route 3 - Horseshoe Bay to Langdale / Sunshine Coast

The following variables are assessed for each route/community pair:

- Change in ferry fares
- Change in passenger traffic
- Estimated demand elasticity
- Estimated lost business revenues, GDP, and employment
- Property values (if avail)
- Population (if avail)

Unless otherwise stated, all residential real estate values and sales data are from the Canadian Real Estate Association and BC Real Estate Association, via BC Stats. BC Ferries passenger fares are from BC Ferries' published fares and Annual Reports. GDP, population, and employment data are from BC Stats.



## ROUTE 7 – SUNSHINE COAST TO POWELL RIVER (EARLS COVE TO SALTERY BAY)

Route 7 from the Sunshine Coast to Powell River is the main route travelled from the Lower Mainland region to the Sunshine Coast, via Sechelt Peninsula. Powell River is a special case in that it is also served by Route 17 from Comox on Vancouver Island. In order to access Powell River from the Lower Mainland (and vice versa), individuals must also take at least two ferries.

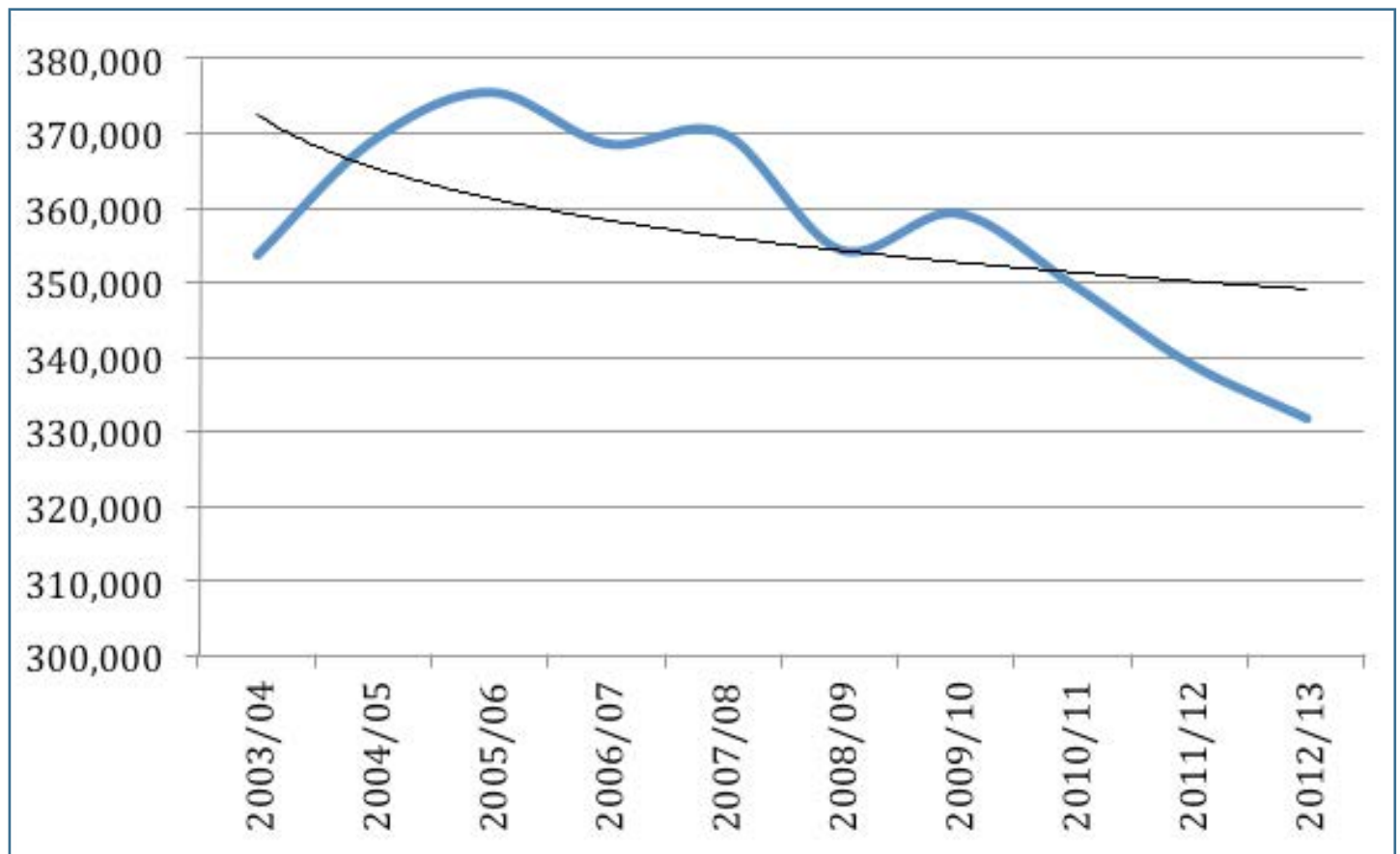
### FARE CHANGES

From 2003 to 2014 passenger fares increased from \$8.00 to \$14.95 on Route 7, a nominal increase of 86.9% over the period. In the same period, vehicle fares increased from \$26.95 to \$49.65, an increase of 89.1%.

### PASSENGER VOLUME CHANGES

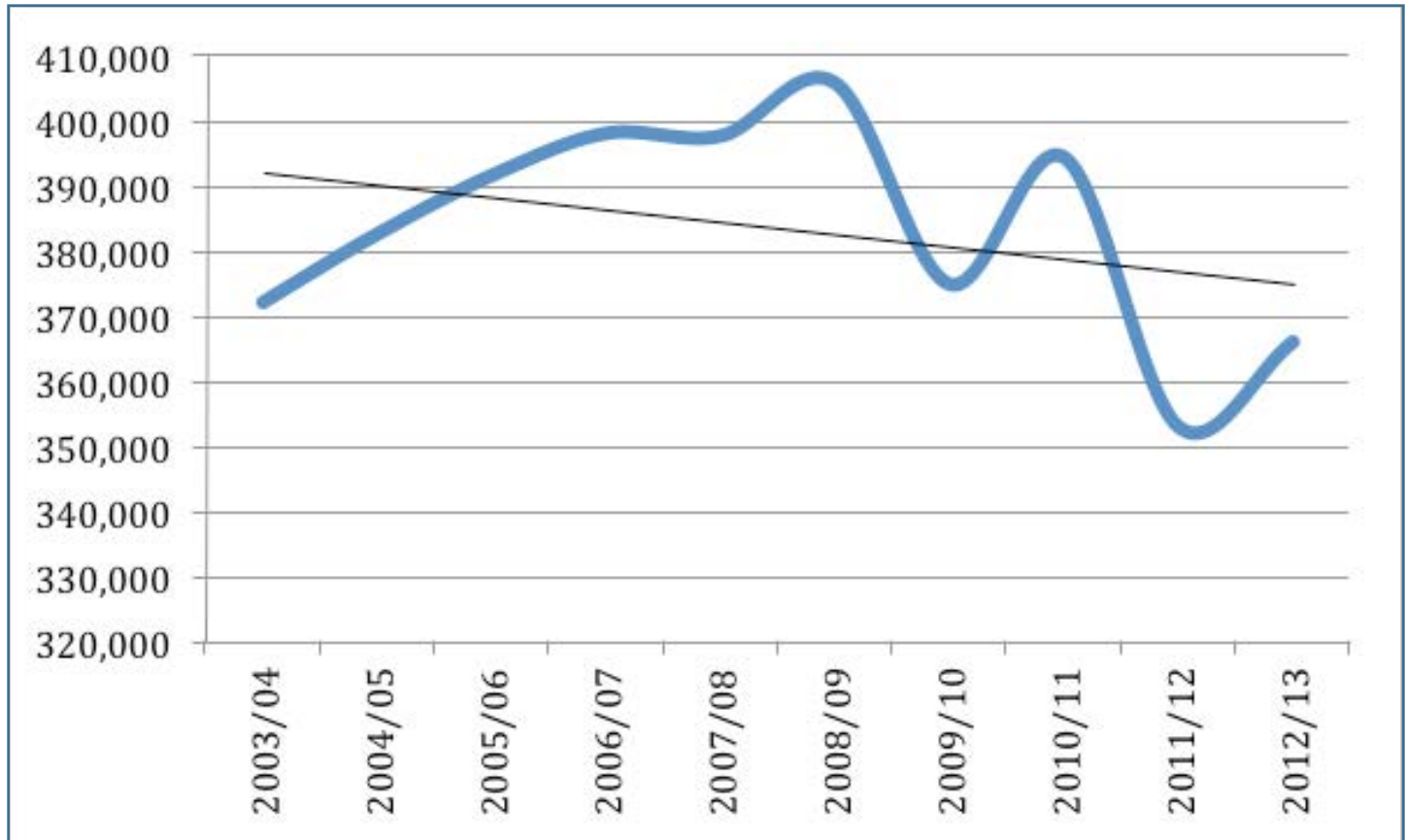
From 2003/04 to 2012/13 total passenger levels decreased from 353,591 to 331,679. This represents a 6.2% passenger decline. However, the peak of passenger traffic was in 2005/06, with more than 375,000 passengers. The total drop from peak to trough was 11.6%.

Figure 45. Passenger Volumes (Route 7; 2003-2013)



By way of comparison, the “other” Powell River ferry, Route 17 to Comox, lost 1.7% of its traffic between 2003 and 2013. However, from the peak in 2008/09 when the route saw 405,586 total passengers, the route has lost 9.8% of its passenger volumes.

**Figure 46.** Route 17 Passenger Volumes (2003-2013)



### ESTIMATED DEMAND ELASTICITY

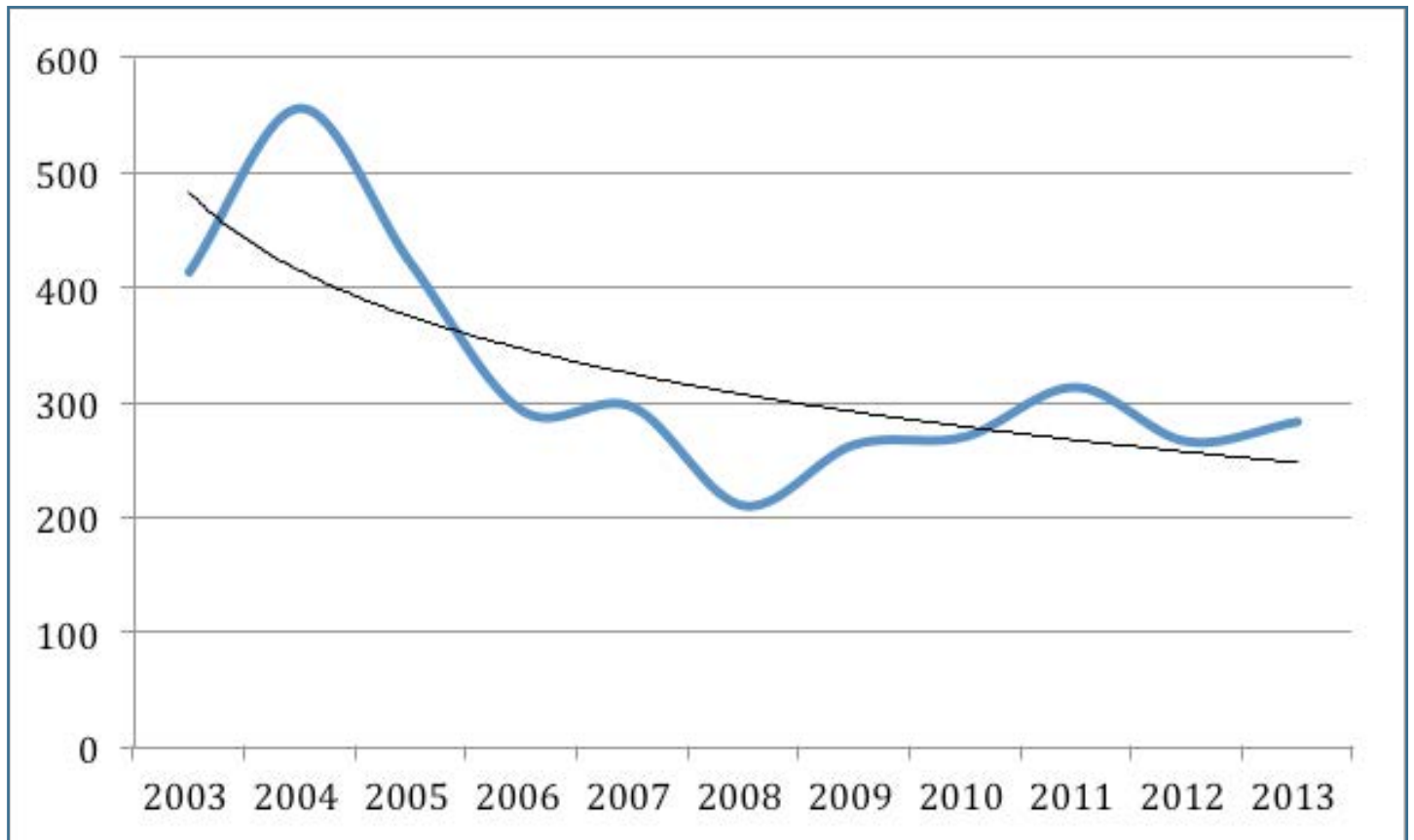
Route 7 has an estimated demand elasticity (inflation and GDP adjusted) of -0.45 over the period, which is slightly more elastic than the Minor Route Group average of -0.30. This means that ferry travellers on this route are slightly more price sensitive than the average for all Minor Routes.



## PROPERTY SALES

From 2003-2013 property sales declined by 31.5% in Powell River.

Figure 47: Property Sales (Powell River, 2003-2013)

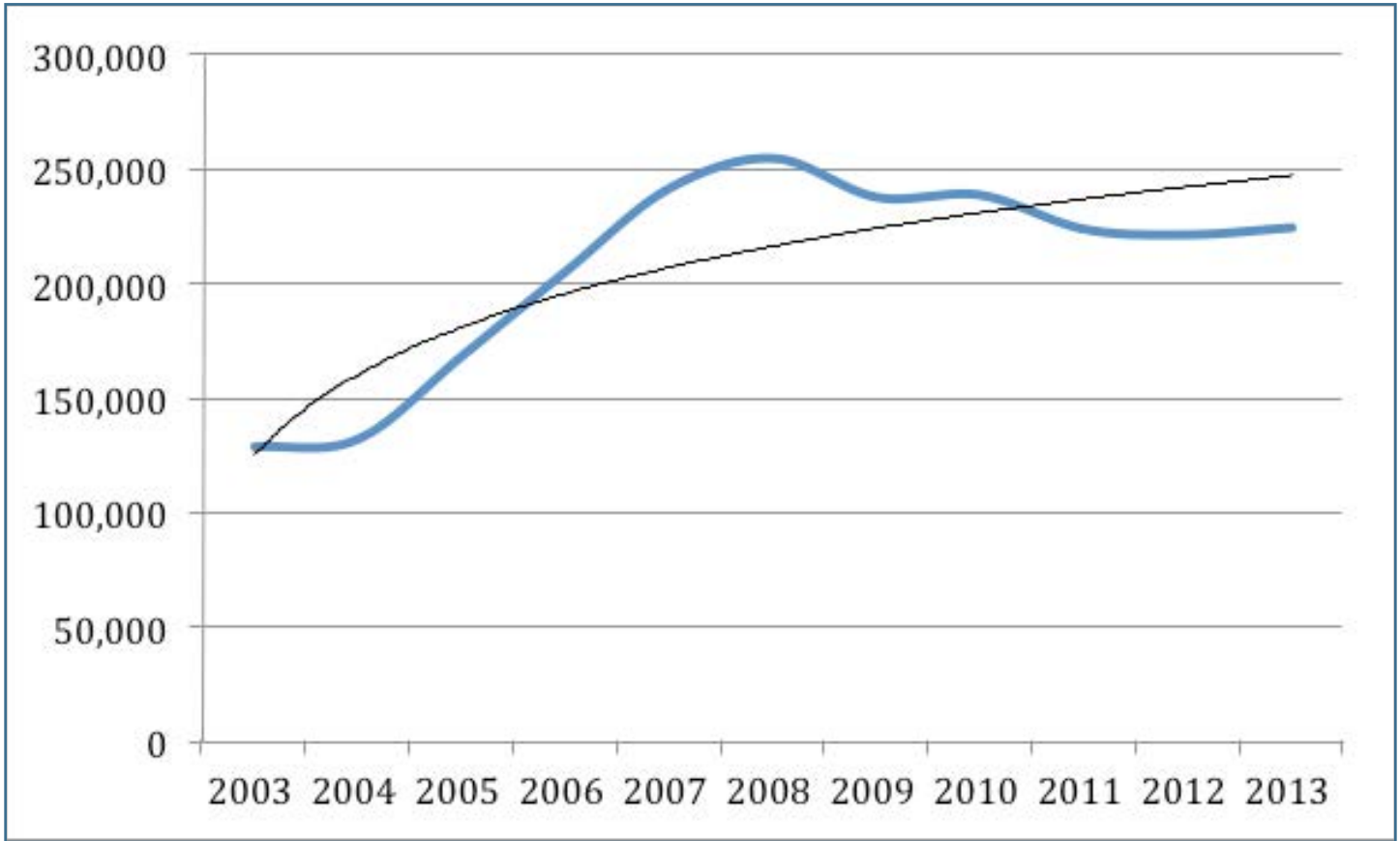


By way of comparison, the number of residential property sales for non-coastal regions in BC over the same period decreased by 21.3%.

## PROPERTY VALUES

From 2003-2013, average residential real estate values in Powell River increased from \$127,000 to \$224,000 - an increase of 75% over the period.

**Figure 48:** Residential Real Estate Prices (Powell River, 2003-2013)

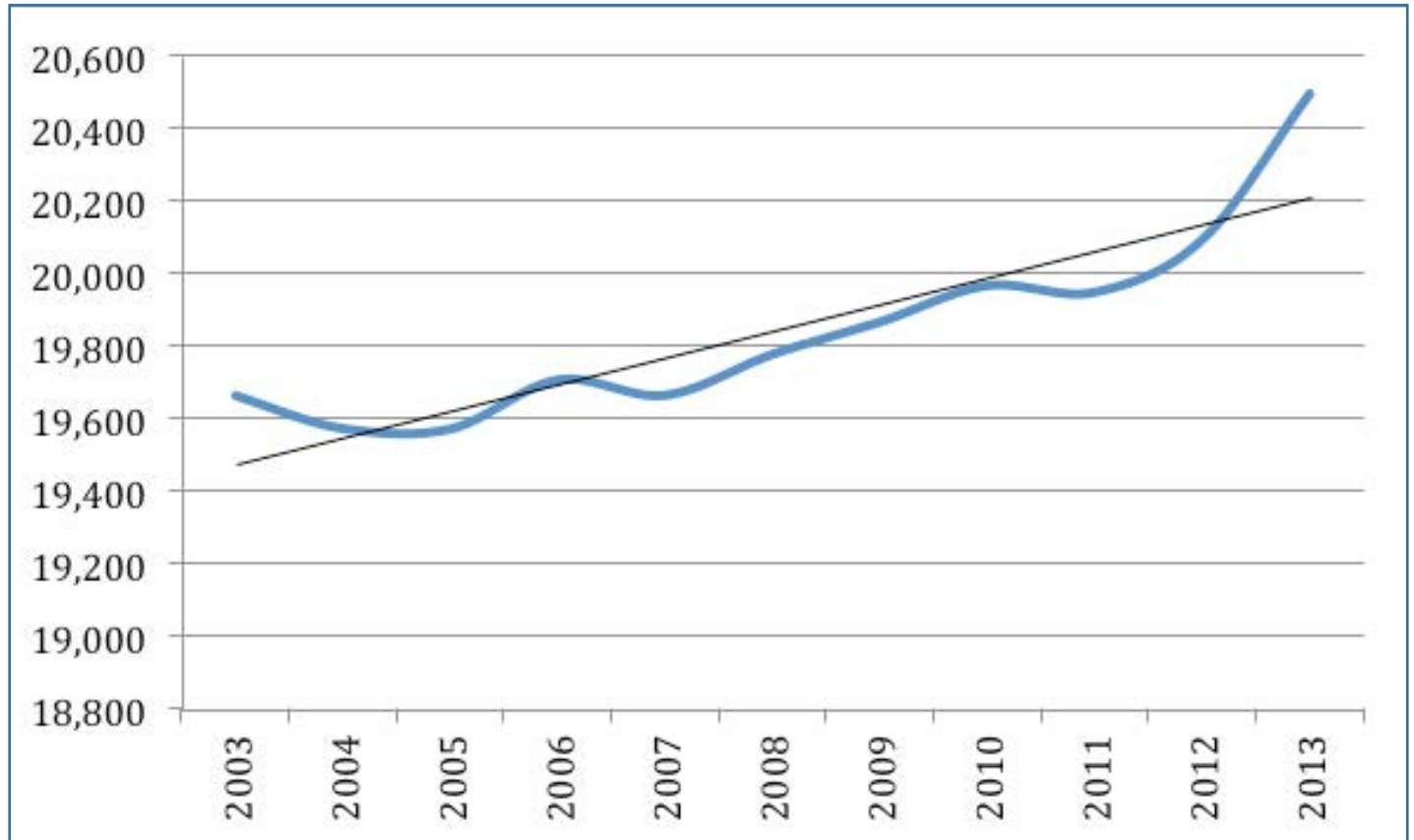




## POPULATION CHANGES

The population of the Powell River Regional District has increased from 19,658 in 2003 to 20,493 in 2013, representing an increase of 4.2% over the period.

Figure 49: Population Change (Powell River, 2003-2013)



This rate of increase is roughly one-third of the rate of population increase of non-coastal regions during the same period, which grew by an average of 12.2%.



## ROUTE 1 - SWARTZ BAY TO TSAWWASSEN

Route 1 is the largest route in the BC Ferries system, in terms of total passenger and vehicle volumes. The service operates between Tsawwassen, approximately 30 km from Vancouver, and Swartz Bay terminal near Sidney on Vancouver Island (approximately 32 km from downtown Victoria, British Columbia).

As mentioned previously, Route 1 is the primary ferry service between Vancouver and Victoria. While Vancouver is not traditionally considered a “ferry dependent community” due to the fact that access to Vancouver is not predominately dependent on ferry service. However, any impacts on the ferry system will have notable impacts on Vancouver, as well as Victoria.

### FARE CHANGES

From 2003-2014 passenger fares on Route 1 increased from \$9.50 to \$16.25 – an increase of 71.1% over the period. In the same period, standard vehicle fares increased from \$31.50 to \$53.25 – an increase of 69%.

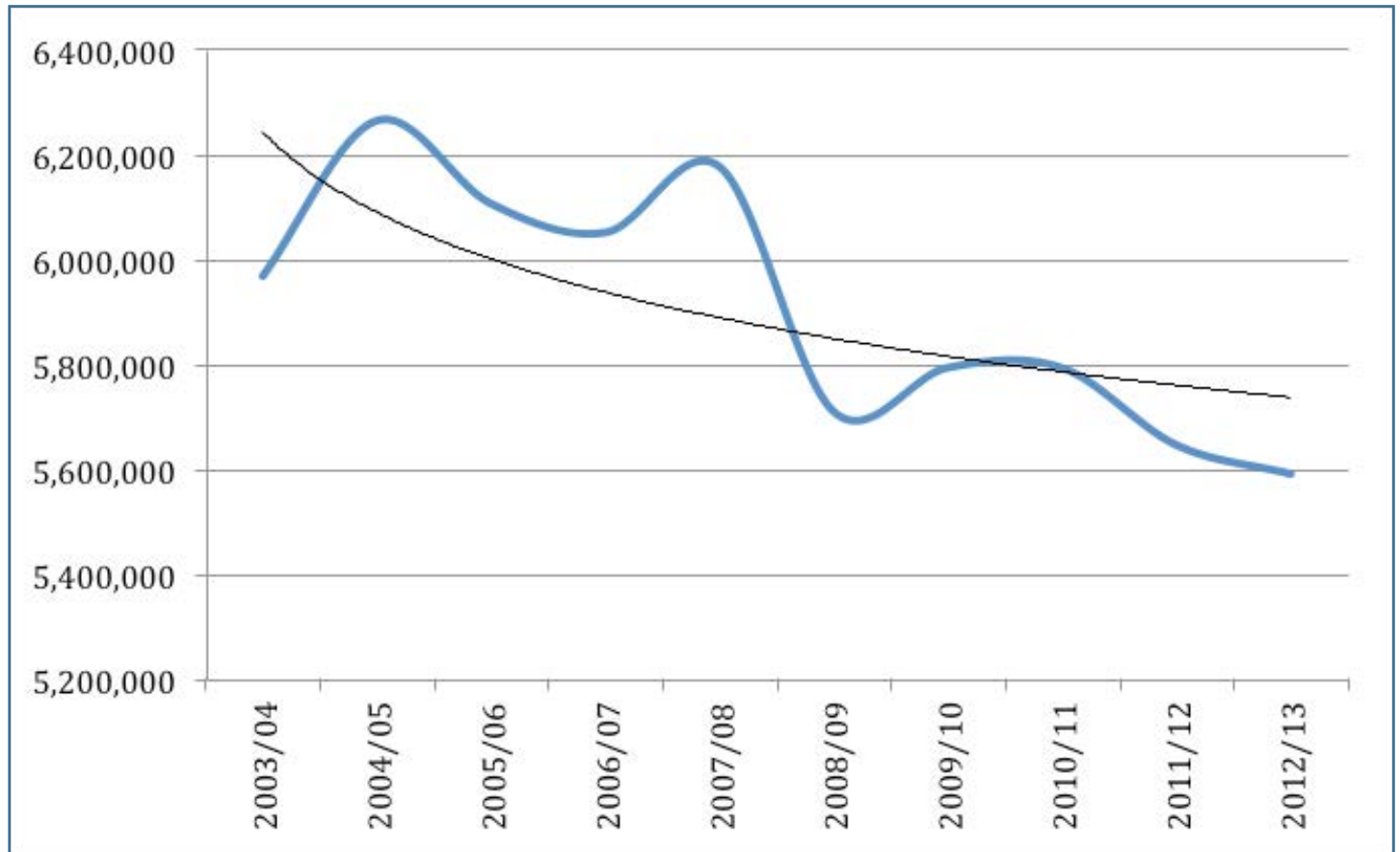
### PASSENGER VOLUME CHANGES

From 2003/04 to 2012/13 the total passenger traffic on Route 1 declined from approximately 5.97 million passengers to 5.59 million passengers, representing a decline of 6.3% over the period. From its peak passenger year in 2004/05, when nearly 6.3 million passengers used the service, passenger volumes have declined by 10.8%, representing 673,000 fewer passengers each year.

Perhaps a more alarming statistic is that the total passenger volumes have declined by 9.5% between 2007/08 and 2012/13, meaning that in only five years total ridership declined by 585,000 travellers.



Figure 50: Total Passenger Volumes (Route 1: Swartz Bay – Tsawwassen, 2003-2013)



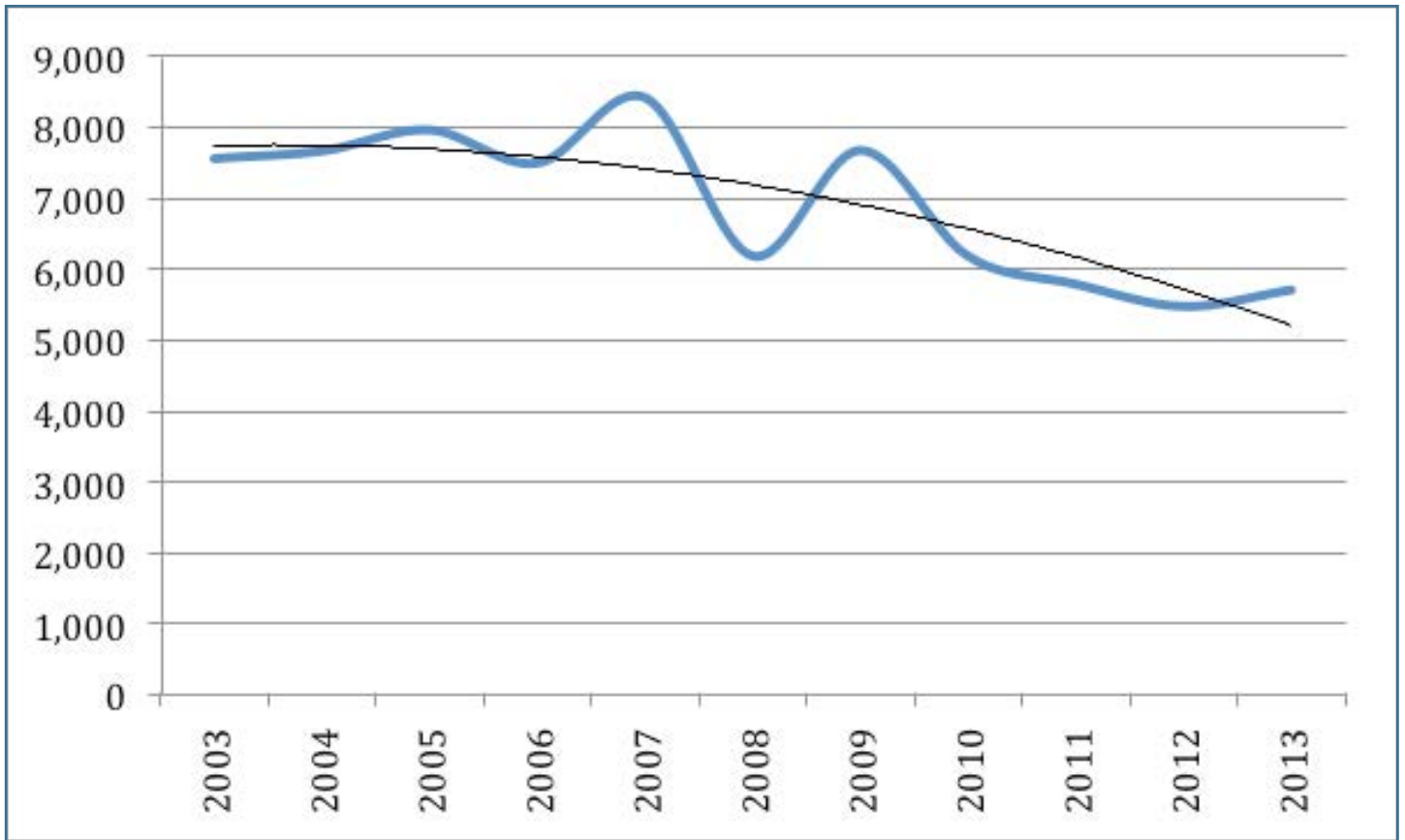
### ESTIMATED DEMAND ELASTICITY

The demand elasticity of Route 1 from 2003-2013 is estimated at -1.1. This result may seem surprising in light of the fact that it is often cited that Route 1 has “only” lost 6% of its traffic since 2003. However, the average fare increases on Route 1 (and other Major Routes) was significantly lower than for nearly all other routes in the system. When inflation and GDP growth are factored-in, the average fare increase is actually quite negligible, particularly when calculated as a ratio of passenger volume declines.

### PROPERTY SALES

Total annual residential real estate sales have declined by 24% between 2003 and 2013. This is roughly equivalent to the 21.3% decline that occurred throughout non-coastal communities in British Columbia over the same period.

Figure 51: Residential Real Estate Sales – Victoria (2003-2013)

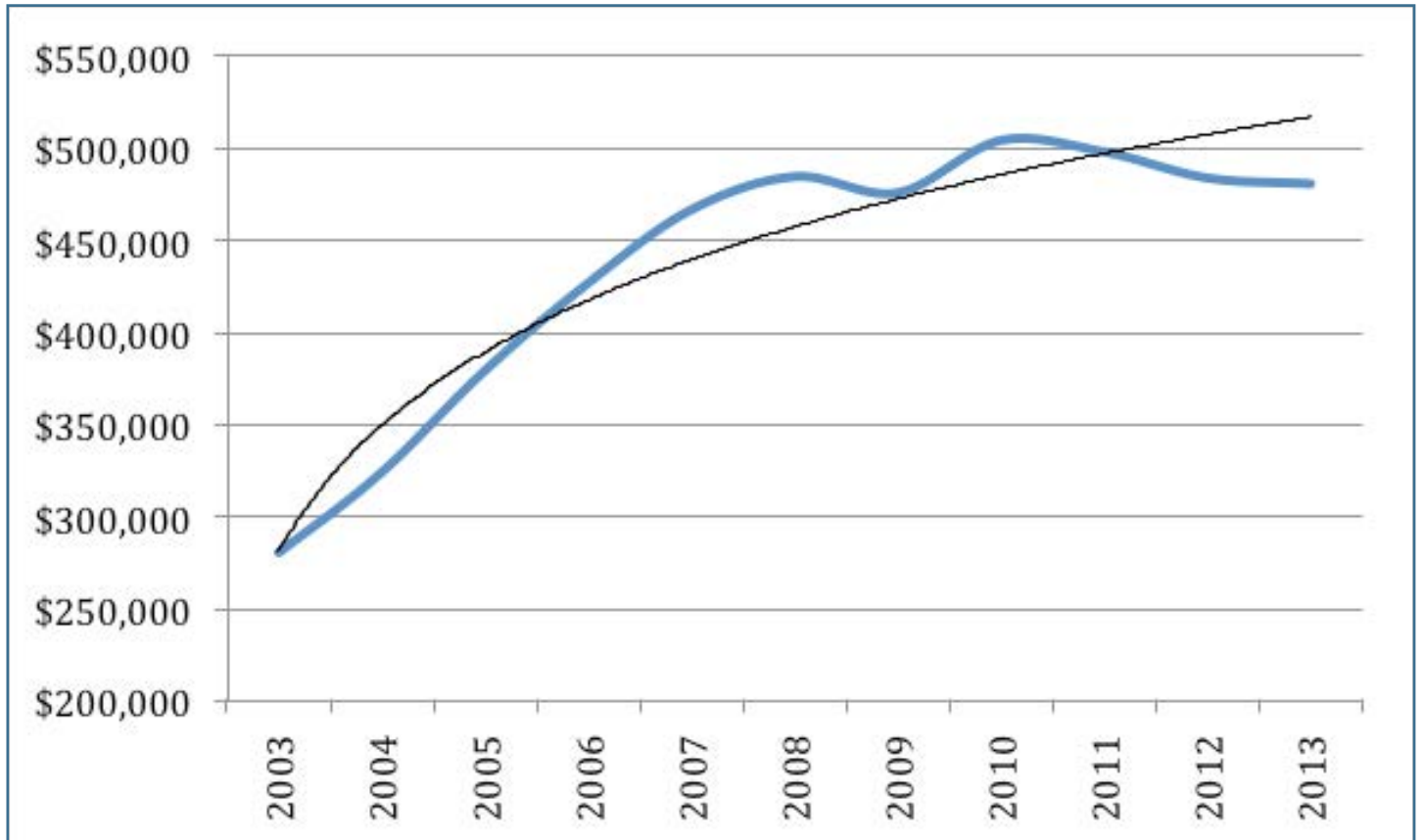




## PROPERTY VALUES

Residential real estate prices increased by 72% over the period 2003-2013, compared with a 109% increase for non-coastal regions throughout British Columbia.

**Figure 52:** Residential Real Estate Prices (Victoria, 2003-2013)

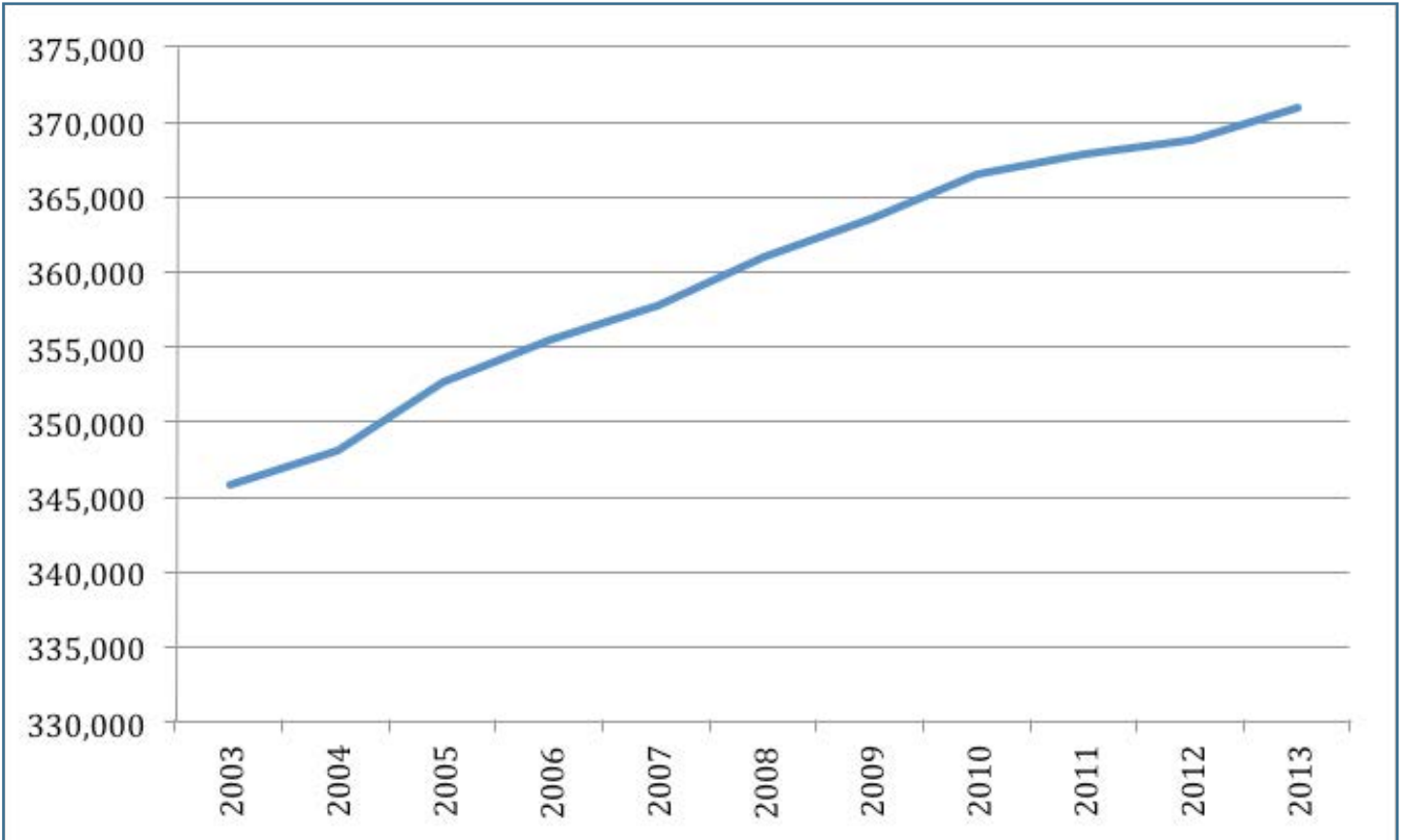


Another notable trend is the continued softness of residential real estate prices in Victoria since the recession, declining 0.9% from 2009-2013.

## POPULATION CHANGES

Populations in the Capital Regional District grew throughout the period 2003-2013, from 346,000 to 371,000. This represents an increase in population of 7.3% over the period, slightly higher than the average for all coastal communities (6.4%) but well below the growth rate of non-coastal British Columbia over the same period (12.2%).

**Figure 53:** Population Change (Capital Region, 2003-2013)





## **ROUTE 10 - INSIDE PASSAGE - PORT HARDY TO PRINCE RUPERT**

Route 10 is the longest and most expensive route in the BC Ferries system, travelling 274 nautical miles (507 kilometres) between Port Hardy on the northern end of Vancouver Island, and Prince Rupert in Northwestern BC.

Route 10 is a heavily travelled service that is a major tourism “Circle Route” connector for northern Vancouver Island, the Central Coast, and the North Coast, including not only Prince Rupert but also connecting traffic travelling to Haida Gwaii.

### **FARE CHANGES**

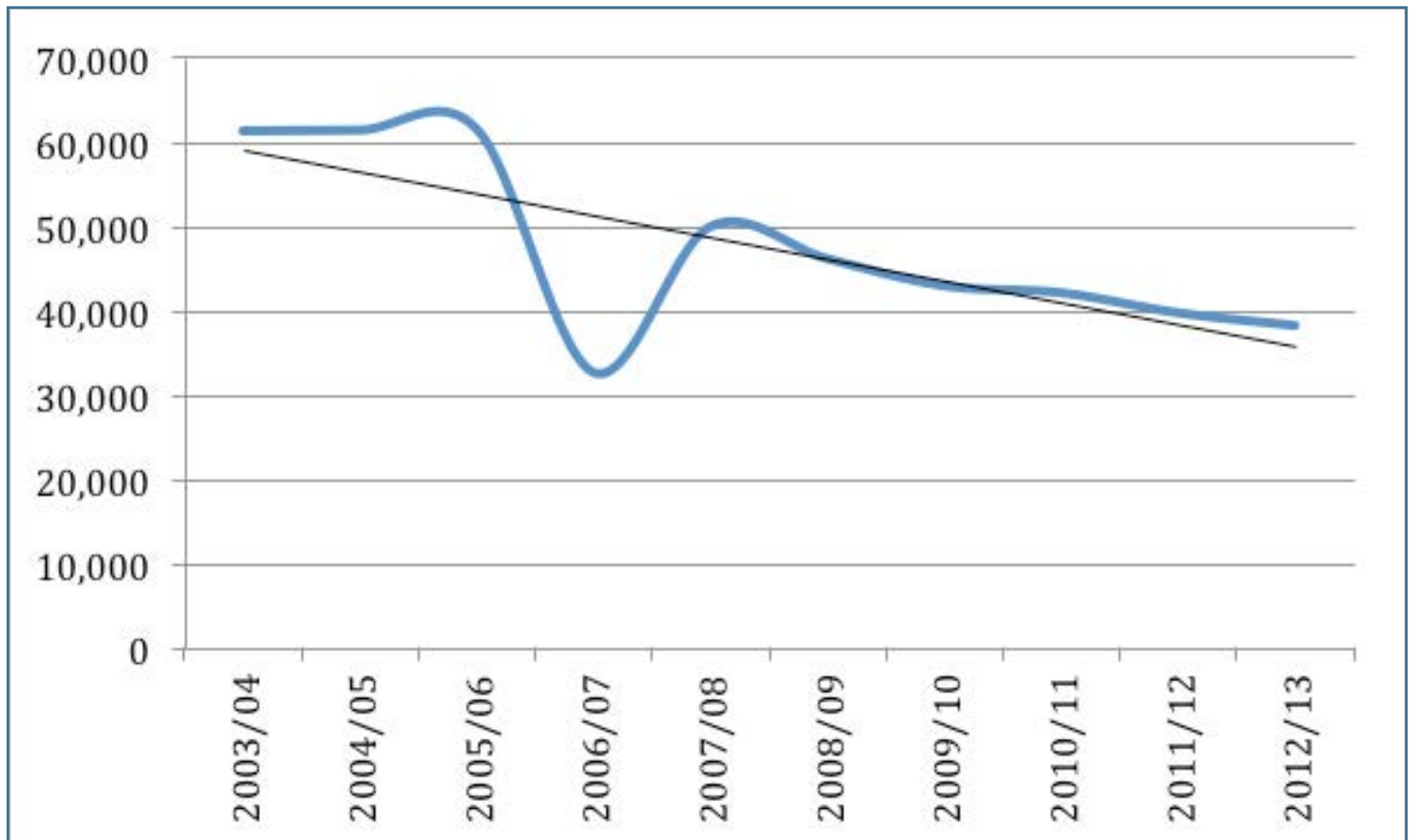
Route 10 has had significant fare increases for both passengers and vehicles, due to the fact that the route had a lower relative cost recovery ratio than most other routes in the system, and the provincial government has sought to improve the cost recovery ratio for all Minor Routes and Northern Routes since 2003.

Since 2003, peak season passenger fares have increased from \$99.00 (one-way) to \$197.50 – an increase of 100% in ten years.

In the same period, peak season vehicle fares increased from \$223 (one-way) to \$451 representing an increase of 102%.

### **PASSENGER VOLUME CHANGES**

Route 10 has experienced the sharpest drop-off in passenger volume out of all BC Ferries routes since 2003, losing 37.7% of its ridership over the period.

**Figure 54:** Passenger Volumes (Route 10, 2003-2013)

It should be noted that in 2006/07 ridership declined significantly due to the loss of the queen of the north and resulting capacity constraints.

### ESTIMATED DEMAND ELASTICITY

Route 10 between Prince Rupert and Port Hardy has the highest demand elasticity of all the routes in BC Ferries, estimated at -1.24. This means that for every 1% increase in fares, we can expect a 1.24% reduction in passenger demand.

This conforms with economic theory, which has demonstrated that, all things equal, more expensive items are more elastic, as a similar percentage increase in price will have a relatively higher overall price increase. For example, an 20% increase in the price of a candy bar from \$1.00 to \$1.20 will not result in as significant a demand reduction as a 20% increase in the price of a television from \$1,000 to \$1,200.

### PROPERTY SALES/VALUES AND POPULATION CHANGES

Due to the context and orientation of Route 10 being primarily a non-primary linkage to major population centres for the North Island, Prince Rupert, and the Central Coast, it is not advisable to assess linkages between fares or passenger volumes with downstream impacts in areas such as real estate and population migration.



## ROUTE 22 - DENMAN ISLAND TO HORNBY ISLAND

Route 22 is a relatively short route (1.2 nautical miles) that traverses Lambert Channel, between Denman Island and Hornby Island, between Parksville and Courtenay on Vancouver Island.

The route sees a significant proportion of tourists during the summer season, and also services the resident populations on both Hornby and Denman Islands.

### FARE CHANGES

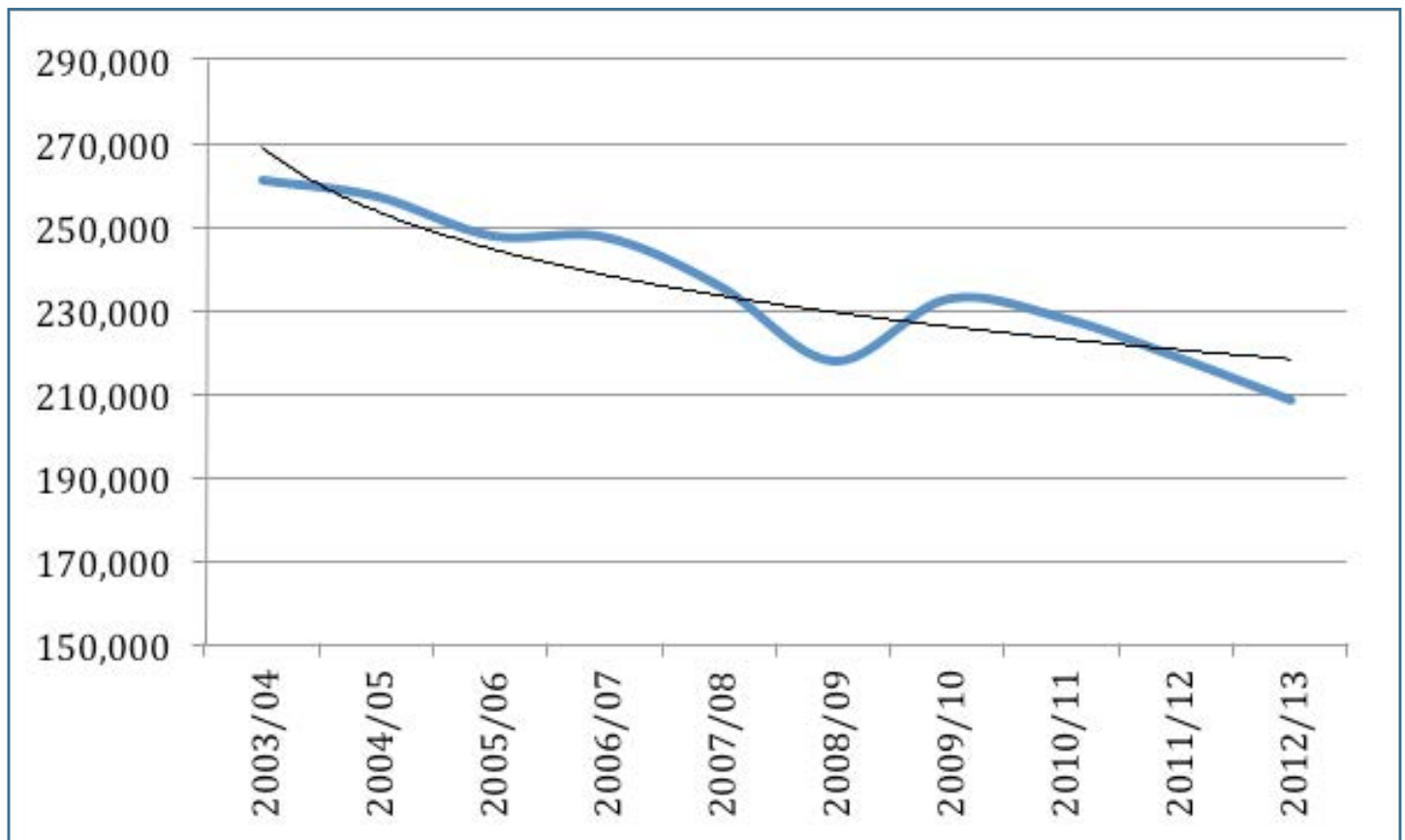
From April 2003 to April 2014 passenger fares increased on Route 22 by 98%, increasing from \$5.00 to \$9.90. Vehicle fares increased by 119%, from \$10.50 to \$23.00.

Prepaid fares – typically purchased by residents – increased even more, from \$2.27 to \$5.75 for passengers (153%) and from \$5.63 to \$13.80 for vehicles (145%).

### PASSENGER VOLUME CHANGES

Passenger volumes have declined substantially on Route 22 since 2003, with more than a 20% drop over the ten-year period. In 2003 there were 261,000 passengers on the route, which decreased to 208,000 in 2013, a decline of nearly 53,000 riders.

Figure 55: Passenger Volumes (Route 22, Denman Isl. To Hornby Isl, 2003-2013)





## ESTIMATED DEMAND ELASTICITY

Route 22 has high demand elasticity relative to other routes, estimated at -0.91. Only Route 10 and Route 1 have higher estimated elasticities. This means that users of the Route 22 ferry service will be more sensitive to price changes, reducing their use of the service when prices increase, and increasing their use of the service when prices decrease.

These results are also quite conclusive, as the statistical measure for the relationship (correlation) is very strong, at -0.94. In statistical terms, this is a nearly perfect linear relationship between fares and ridership, meaning that the two move in nearly perfect lockstep with one-another.

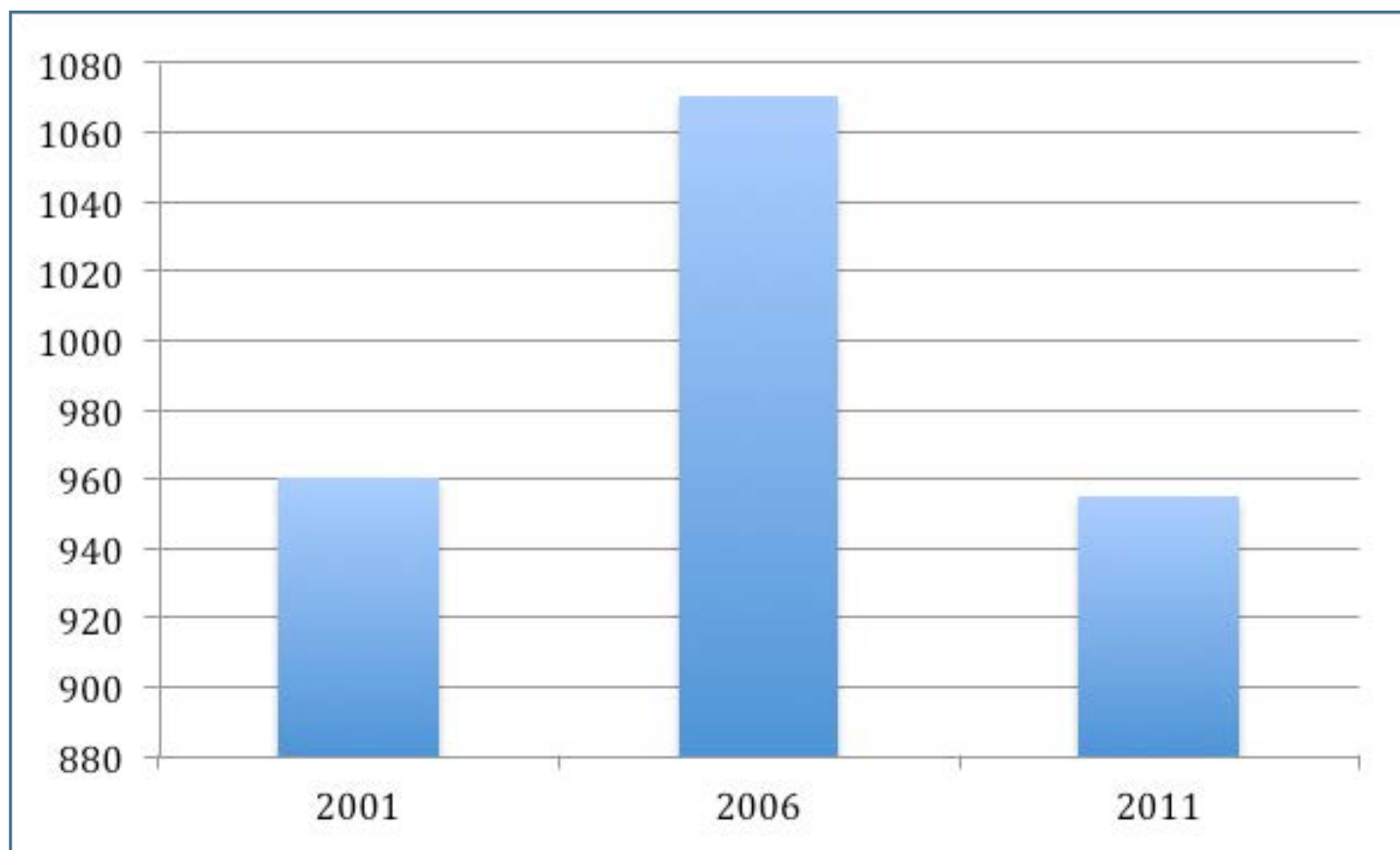
## PROPERTY VALUES

The total value of all assessed residential properties on Hornby Island increased by 39% from 2006-2014. However, from 2011 to 2014 the total assessed value declined by 1.7%.

## POPULATION CHANGES

The population of Hornby Island increased from 960 residents in 2001 to 1,070 residents in 2006, but then declined by 10.7% from 2006 to 2011, to 955 residents.

**Figure 56:** Population Change – Hornby Island (2001-2011)



This decrease in population is the greatest of all jurisdictions in the Islands Trust over the period, which averaged a 3.3% population decrease from 2006-2011.



## **ROUTE 23 - CAMPBELL RIVER TO QUADRA ISLAND**

Route 23 is a highly travelled route between Campbell River and Quadra Island. The ferry travels a relatively short distance of approximately two kilometres across the Discovery Passage.

### **FARE CHANGES**

Fares on Route 23 have also increased substantially, percentage-wise. In 2003 the standard off-peak passenger fare was \$4.75, while the vehicle fare was \$11.00. By April 2014 the passenger fare increased to \$9.90 (+108% over 2003) while vehicle fares increased to \$23.00 (+109% over 2003).

### **PASSENGER VOLUME CHANGES**

Passenger volumes also declined substantially on Route 23 over the ten-year period of 2003 to 2013, decreasing from 923,000 travellers in 2003 to 785,000 travellers in 2013. This represents a passenger decline of 15.2% over the period, or 140,000 fewer travellers each year.

An interesting finding from the analysis of passenger volume changes relative to fares is that Route 23 had the strongest correlation between fare increases and passenger volume declines. The correlation between fare increases and ridership declines was -0.96, nearly a perfect linear relationship between the two variables.

### **ESTIMATED DEMAND ELASTICITY**

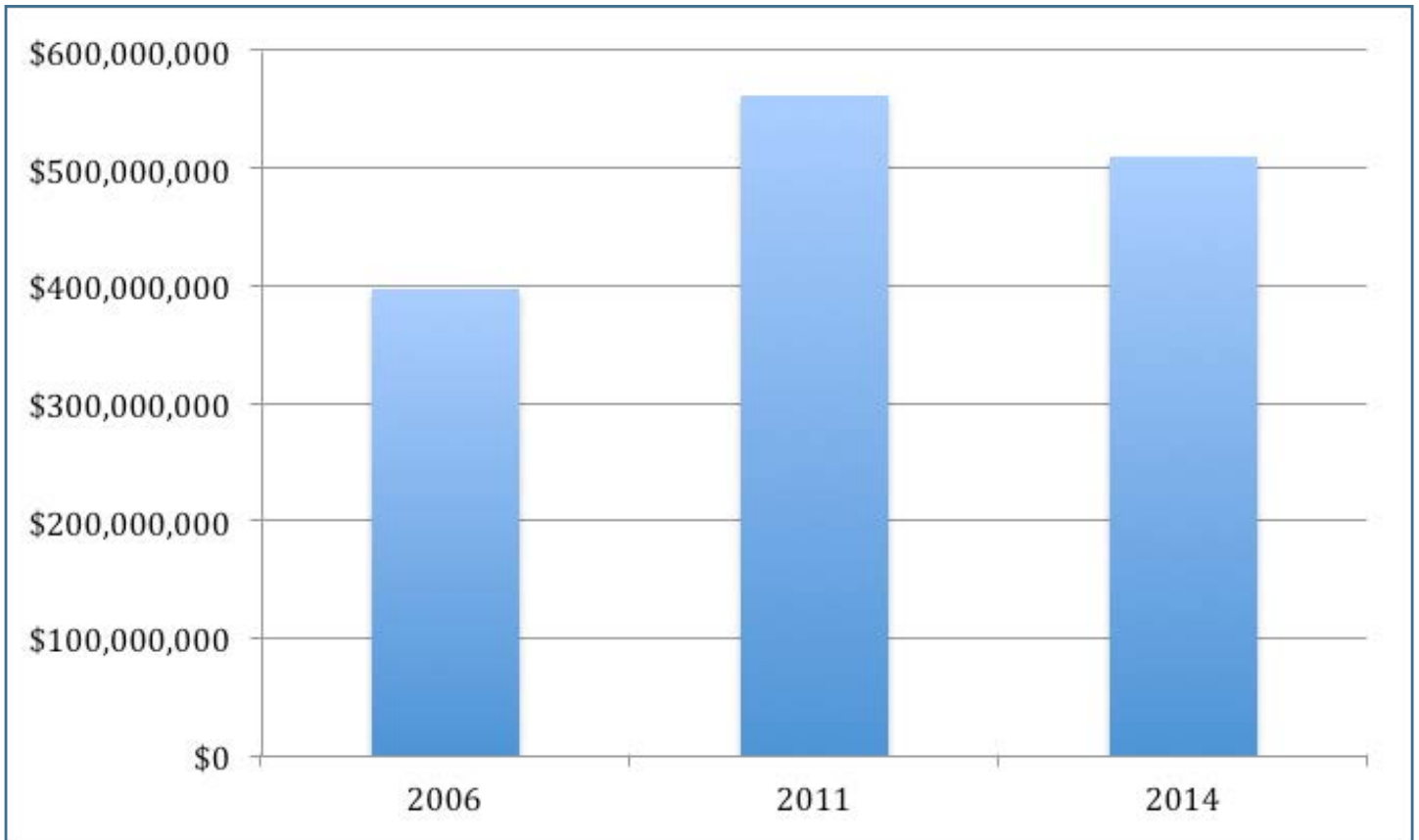
The demand elasticity for Route 23 from 2003-2013 is estimated at -0.67, which is more than double the rate of the Minor Routes overall (-0.30). This means that for every 10% increase in fares (inflation and GDP-adjusted), we can expect to see a 6.7% decrease in overall ridership.

## PROPERTY VALUES

Like many other coastal regions, assessed property values on Quadra Island increased from 2006-2011, then decreased from 2011-2014.

For Quadra Island, as **Figure 57** (below) demonstrates, the total assessed value of all residential real estate increased from \$397 million in 2006 to \$561 million in 2011, prior to declining to \$509 million in 2014. From 2006-2014 this still represents a 28.2% increase in total assessed value, though the total assessed value decreased by 9.3% in the past three years.

**Figure 57:** Total Assessed Value, Residential Real Estates (Quadra Island, 2006-2014)



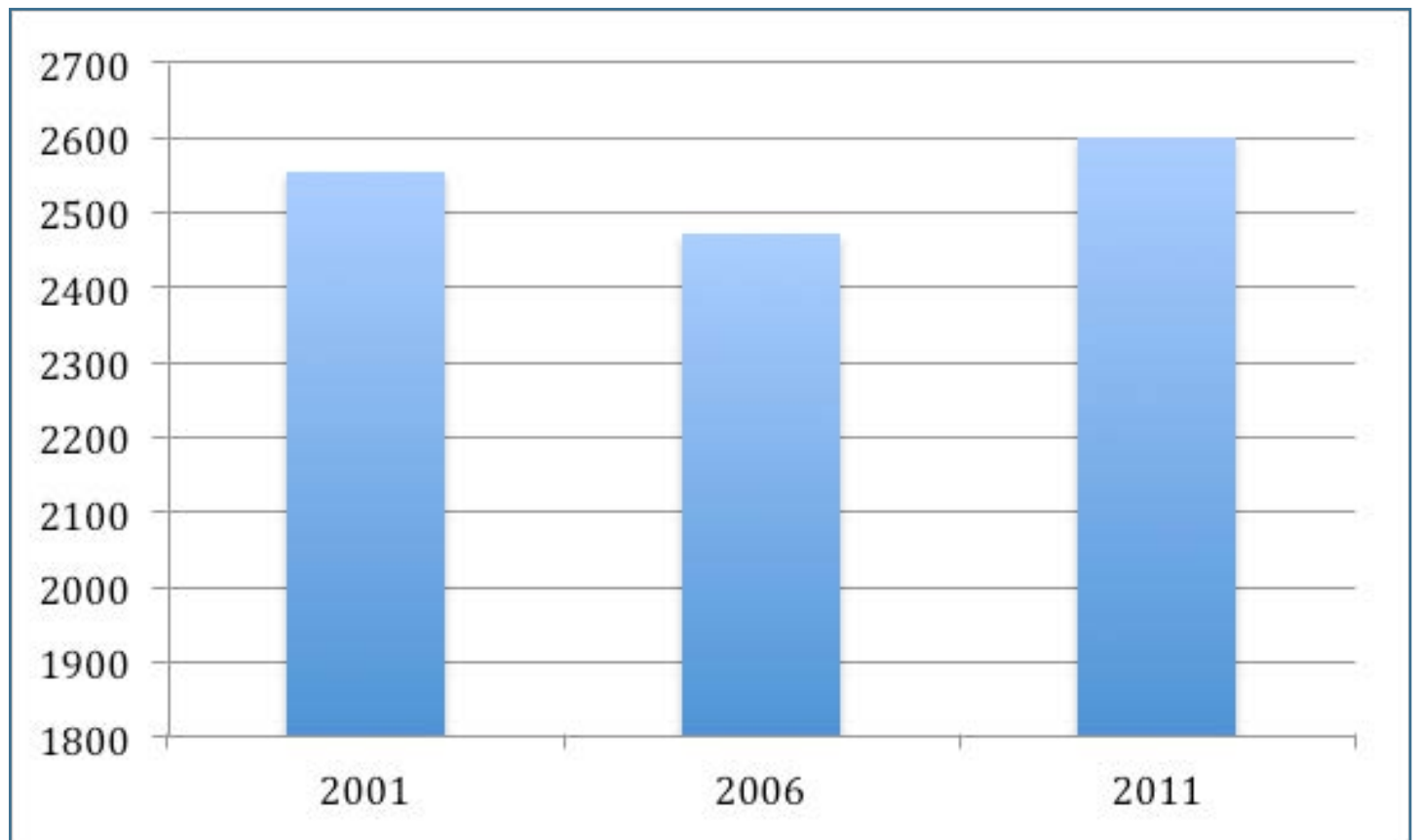
Source: Multiple Listing Service (MLS) via BC Stats



## POPULATION CHANGES

The population trend of Quadra Island has been somewhat counter to that of other coastal communities, registering a 3% decline from 2,555 residents to 2,470 residents between 2001 and 2006, before increasing to 2,601 residents in 2011. Over the ten year period, the population increased by 5.3%.

**Figure 58:** Population Changes (Quadra Island, 2001-2011)



Source: BC Stats

## ROUTE 19 - NANAIMO TO GABRIOLA ISLAND

Route 19 between Nanaimo and Gabriola Island is one of the larger Minor Routes in terms of passenger volumes. The route traverses a total distance of 3.7 nautical miles across Northumberland Channel, and is a popular tourist destination as well as being commonly utilized by both residents of Nanaimo and Gabriola Island, due to its close proximity. The route also services a number of commuters, particularly from Gabriola Island to Nanaimo.

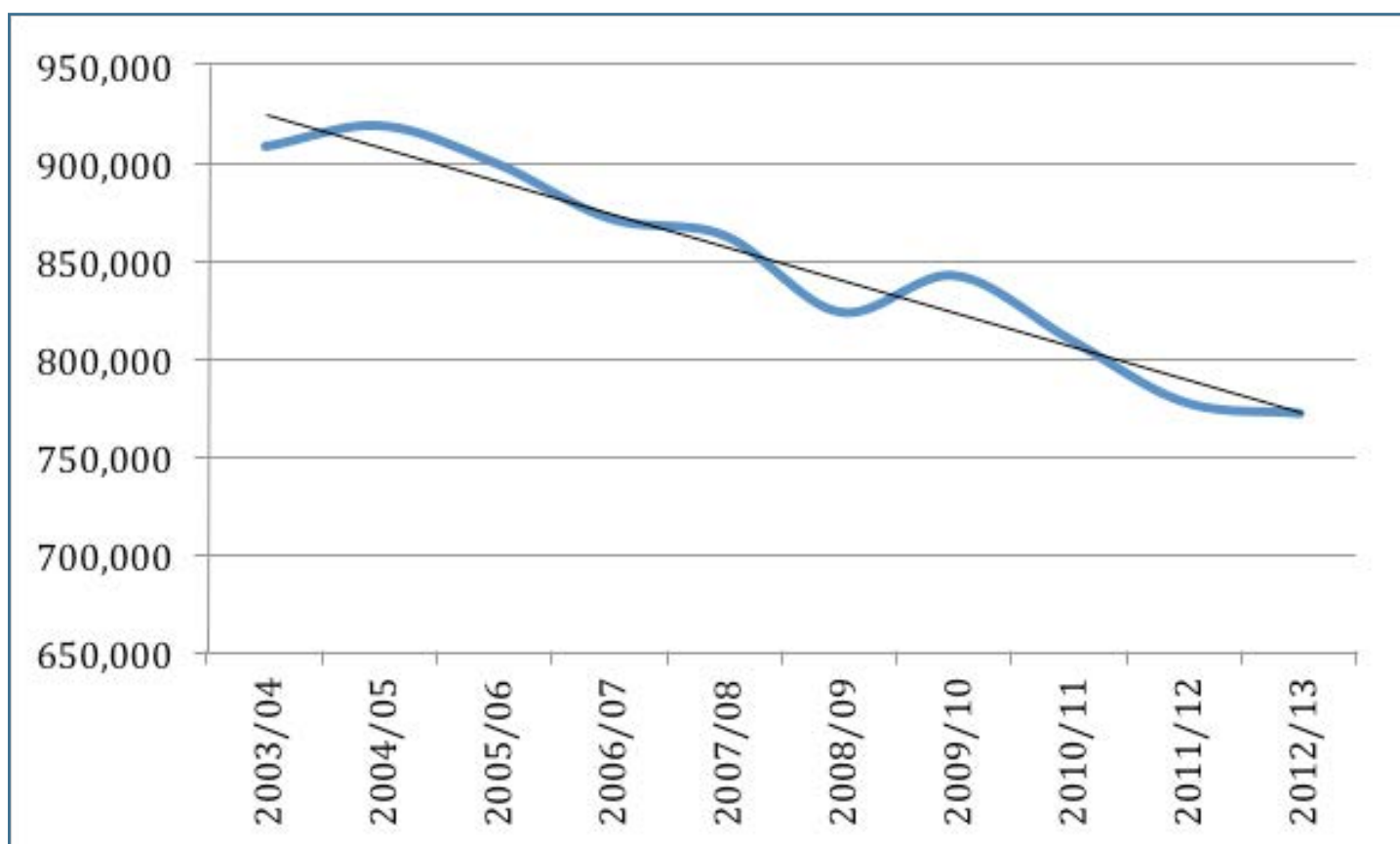
### FARE CHANGES

From 2003 to April 2014 passenger fares increased from \$5.25 to \$10.80, an increase of 106%. During the same period, vehicle fares increased from \$12.50 to \$25.45, for an increase of 104%.

### PASSENGER VOLUME CHANGES

Passenger volumes on Route 19 also declined substantially from 2003 to 2013, decreasing from 908,000 passengers in 2003 to 772,000 in 2013, a total decline of 136,000 annual passengers.

**Figure 59:** Passenger Volumes (Route 19, Nanaimo-Gabriola Island, 2003-2013)



It is also notable that Route 19 has a very strong correlation between ferry prices and ridership levels, with a correlation coefficient of  $-0.96$ . This is nearly a perfect linear relationship between fares and ridership, meaning that whenever fares increase, a proportional decrease in ridership can be consistently witnessed.



## ESTIMATED DEMAND ELASTICITY

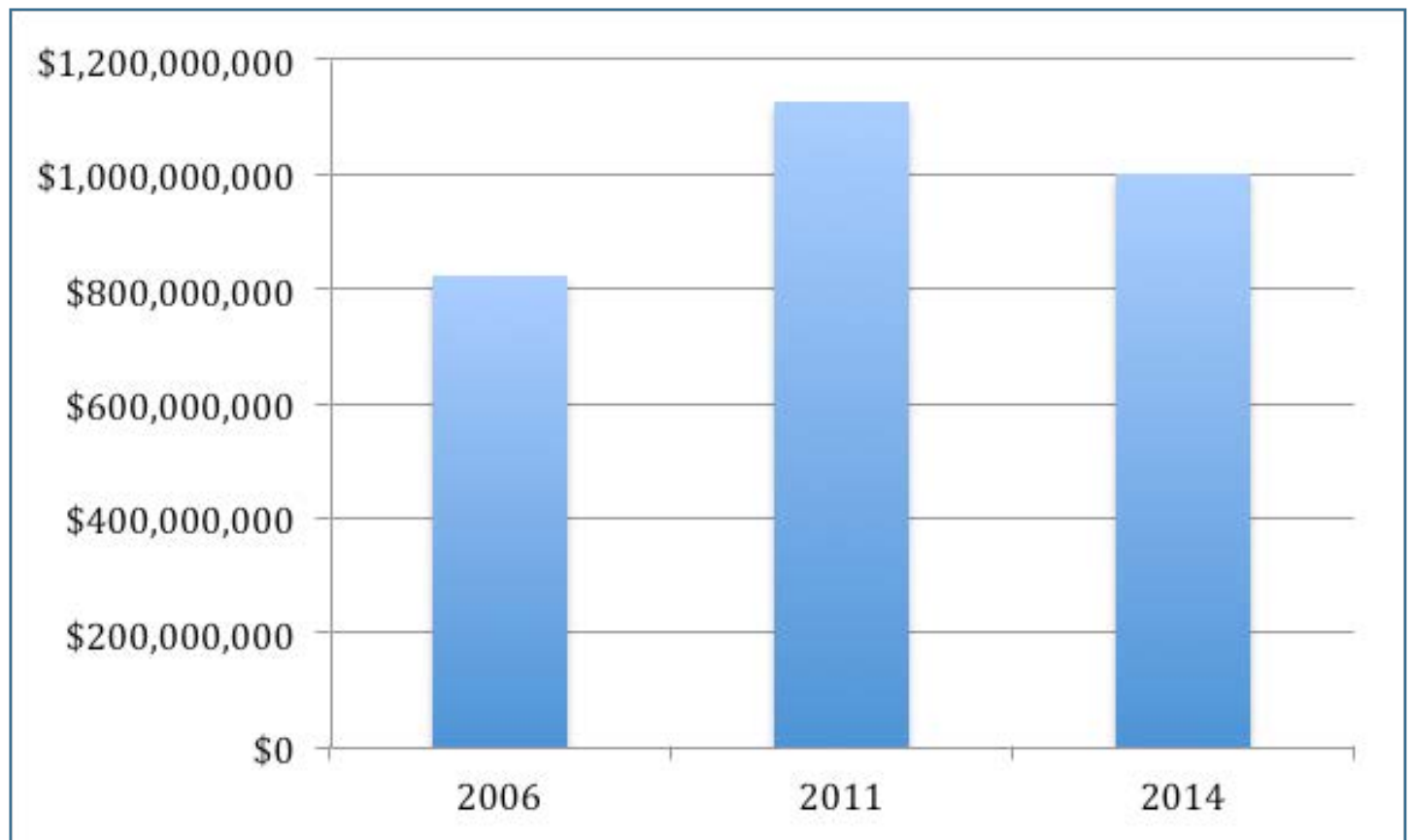
The calculated demand elasticity (price sensitivity) for Route 19 is -0.67, which is more than twice the elasticity of the Minor Routes overall.

This means that when real (inflation adjusted) ferry fares increase by 10%, we can expect a 6.7% decline in ridership.

## PROPERTY VALUES

Assessed property values on Gabriola Island followed similar patterns to other coastal communities, increasing substantially from 2006 to 2011 prior to retracting from 2011 to 2014.

**Figure 60:** Residential Real Estate Prices (Gabriola Island, 2006-2014)



Source: Multiple Listing Service (MLS) via BC Stats

The total assessed value increased from \$823 million to \$1.12 billion from 2006 to 2011, prior to dropping back to \$1.00 billion in 2014, a loss of \$120 million.

## POPULATION CHANGES

The population dynamics on Gabriola Island followed those of other coastal communities, increasing from 2001 to 2006 prior to declining from 2006 to 2011. In 2001 the total population of the island was 3,525 residents, which increased by 14.6% to 2011, prior to declining by less than 1% by 2014.

## ROUTE 5 - SWARTZ BAY TO SOUTHERN GULF ISLANDS (GALIANO, MAYNE, PENDER, SATURNA)

The ferry from Swartz Bay (Vancouver Island) to the Southern Gulf Islands is one of two services to the Southern Gulf Islands, alongside Route 9 (from Tsawwassen). The two routes combined carry nearly one million passengers per year, making them among the largest of the Minor Routes.

As Route 5 and Route 9 have similar price histories and passenger volume changes, Route 5 will be used to describe the overall situation for the Southern Gulf Islands.

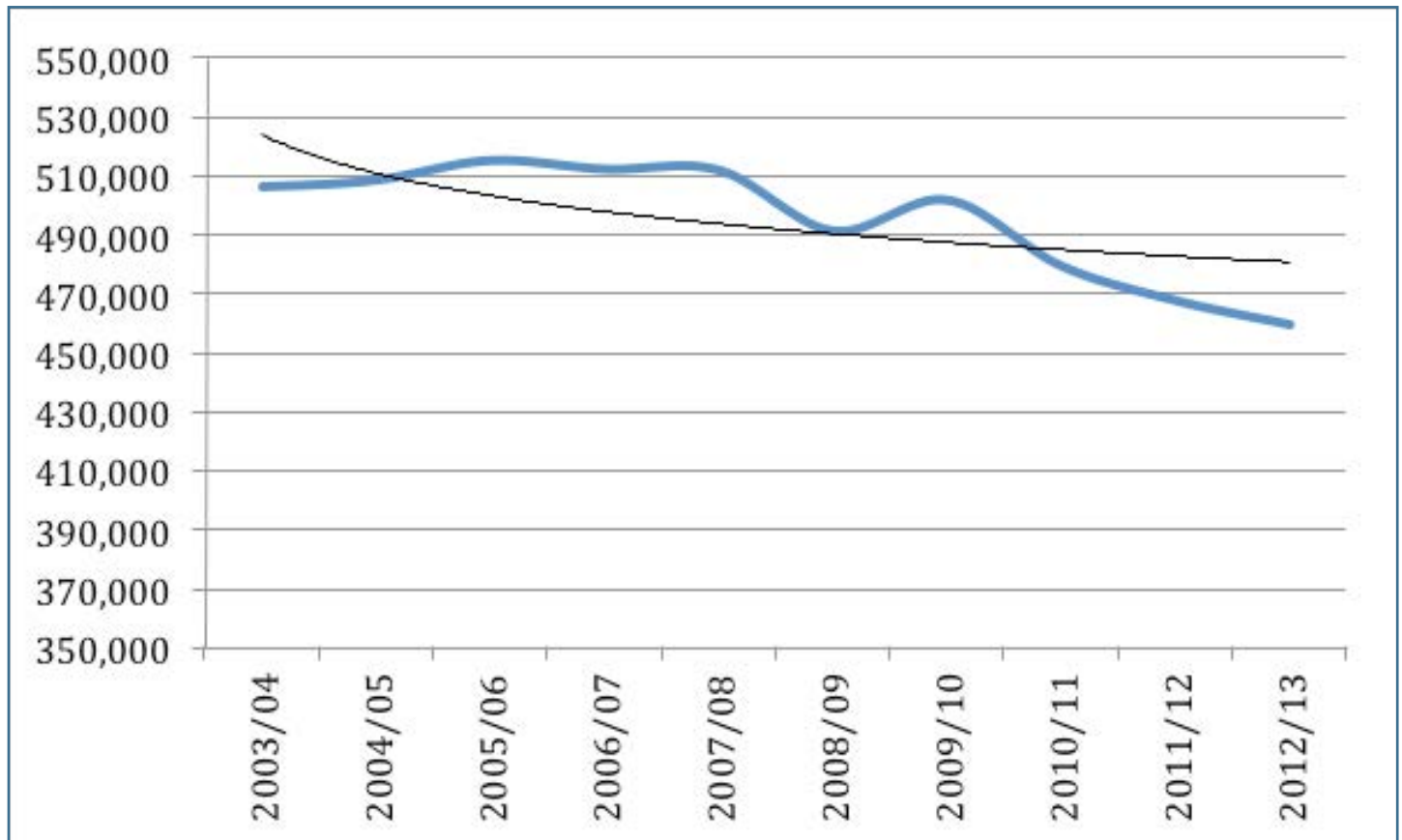
### FARE CHANGES

Passenger fares along Route 5 increased by 102% from 2003 to 2014, from \$6.25 to \$12.60. Vehicle fares similarly increased by 102% over the same period, increasing from \$19.50 to \$39.45.

### PASSENGER VOLUME CHANGES

Ridership of Route 5 declined by approximately 46,000 passengers between 2003 and 2013, representing a 9.2% drop, which is slightly lower than the average for all minor routes.

**Figure 61:** Passenger Volumes (Route 5, Swartz Bay to Southern Gulf Islands, 2003-2013)



There is a relatively strong correlation between fare increases and passenger volumes, with an R-value of -0.85. This means that there is a strong relationship between the changes in fares and the changes in ridership; when fares increase, ridership decreases by a relatively consistent and proportional amount.



## ESTIMATED DEMAND ELASTICITY

The demand elasticity for Route 5 from 2003 to 2013 was calculated at -0.45, meaning that when fares increase by 10% we can expect a 4.5% decrease in passenger ridership.

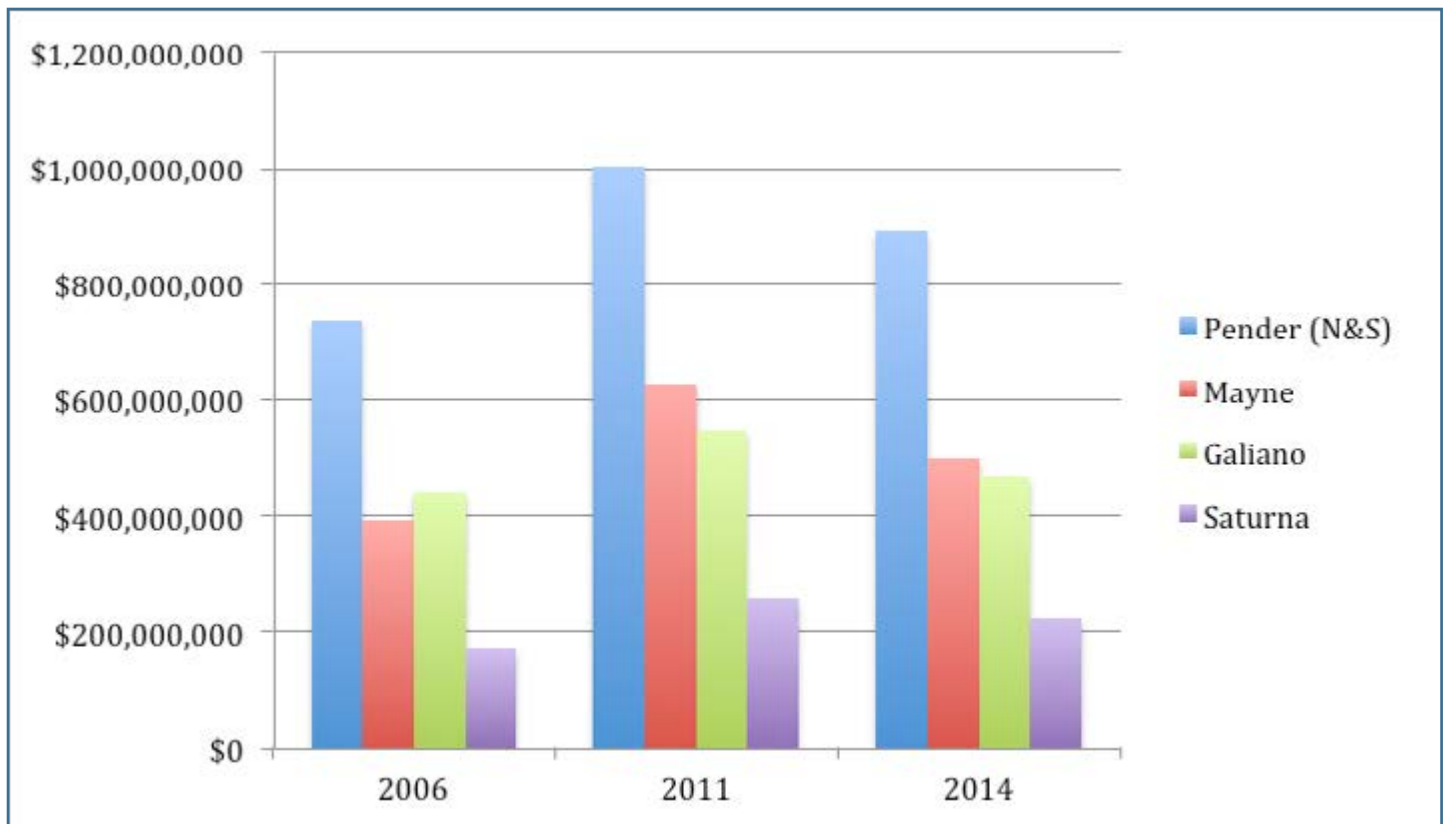
This demand elasticity is slightly higher than the average for all minor routes, meaning that users of this route are slightly more sensitive to price increases (and, in theory, price decreases).

## PROPERTY VALUES

Total assessed property values on the Southern Gulf Islands all followed similar trends as the majority of coastal communities, increasing substantially from 2006 to 2011, then declining from 2011 to 2014.

For all four islands combined, the total value of residential real estate increased from \$1.74 billion to \$2.44 billion between 2006 and 2011, prior to declining to \$2.08 billion – a drop of 14.7% in only three years.

**Figure 62:** Total Assessed Real Estate Values – Southern Gulf Islands (2006-2014)

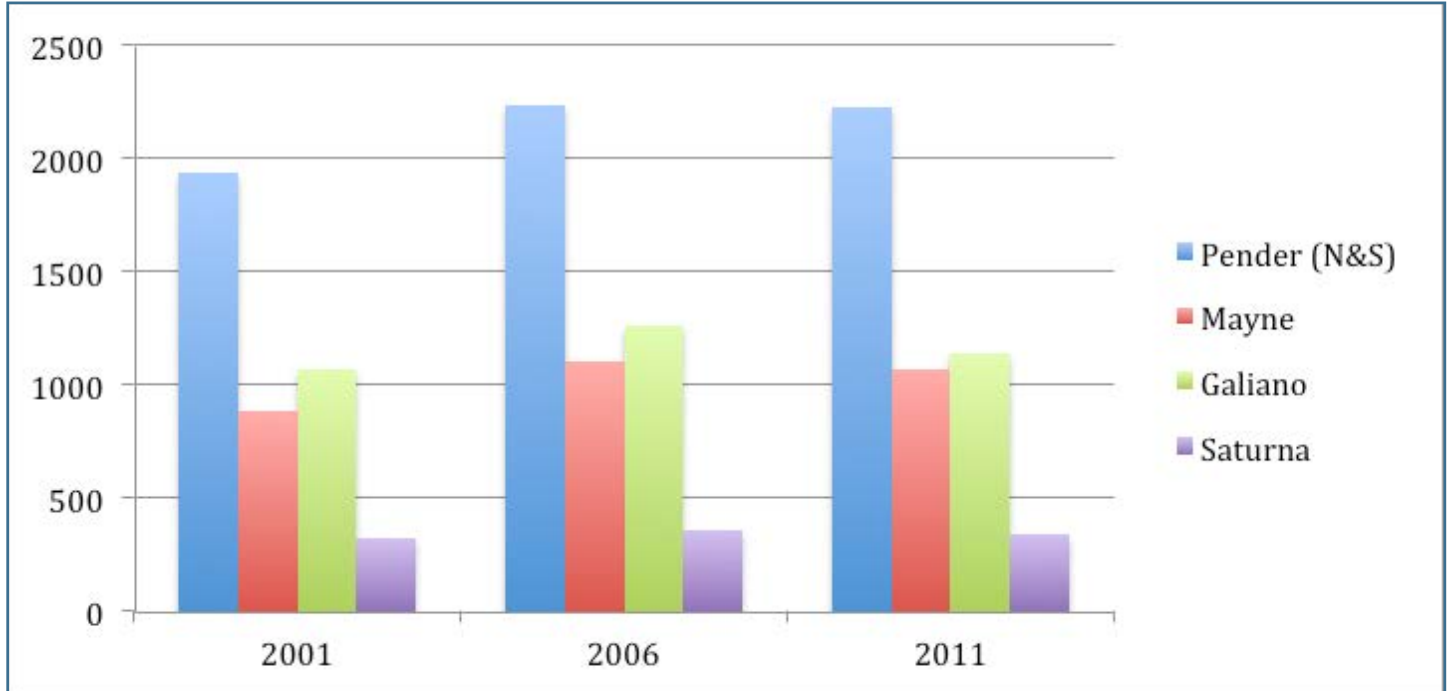




## POPULATION CHANGES

The populations of all four Southern Gulf Islands increased from 2001 to 2006, then decreased by 2011. In total, the four islands increased in population from 4,210 to 4,960 between 2001 and 2006, then declined to 4,772 by 2011. Over the period of 2001-2011 the total population increased by 13.3%, however from 2006-2011 the population declined by 3.8%.

**Figure 63:** Population Change, Southern Gulf Islands (2001-2011)





## ROUTE 3 - HORSESHOE BAY TO LANGDALE / SUNSHINE COAST

The ferry from Horseshoe Bay (Vancouver) to Langdale Terminal is the third-largest route by ridership, carrying more than 2.5 million passengers each year.

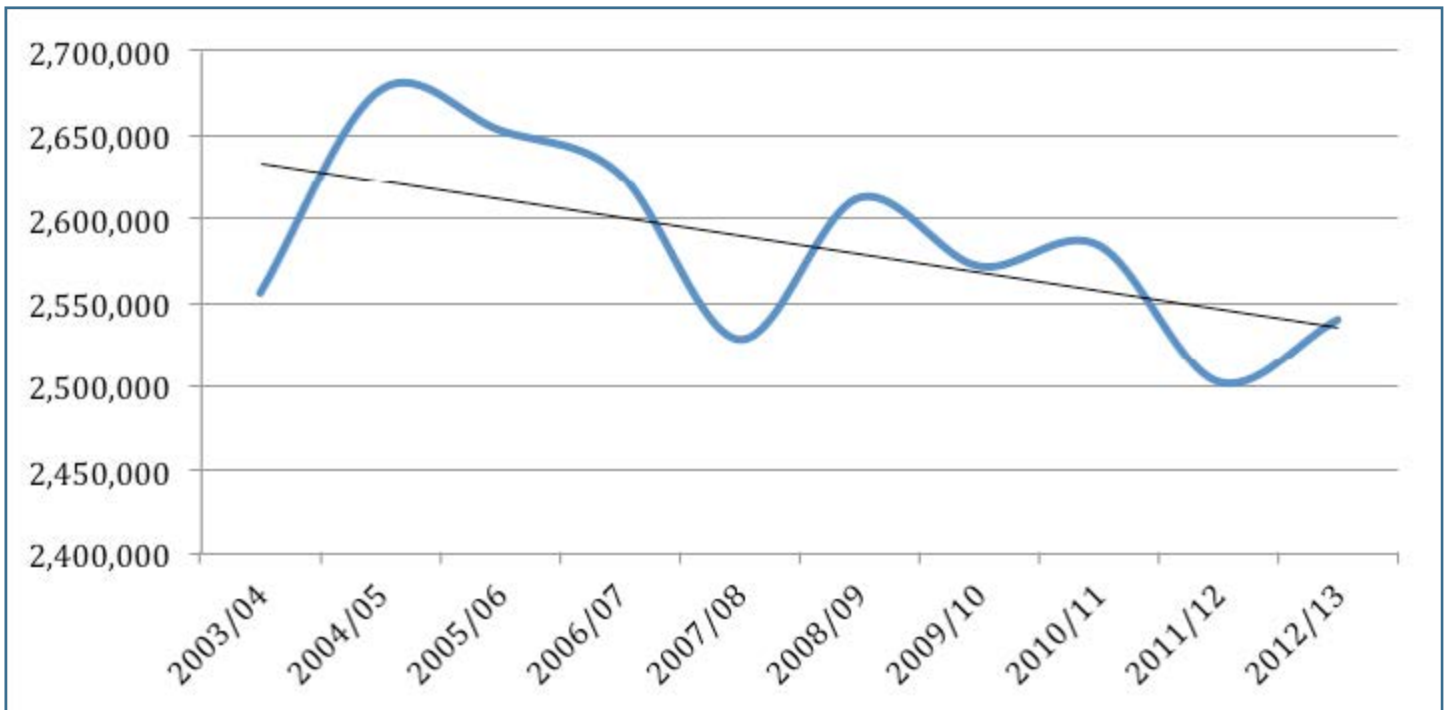
### FARE CHANGES

Passenger fares along Route 3 increased by 81.9% from 2003 to 2014, increasing from \$8.00 to \$14.55 for a one-way trip. Vehicle fares increased slightly more, at 86.9% over the period, from \$26.25 to \$49.05 for a standard vehicle.

### PASSENGER VOLUME CHANGES

Ridership of Route 3 declined by only 0.6% from 2003/04 to 2012/13, and from the peak year of 2004/05 passenger volumes declined slightly more, at 5.1%.

Figure 64: Passenger Volumes (Route 3, Horseshoe Bay to Langdale , 2003-2013)

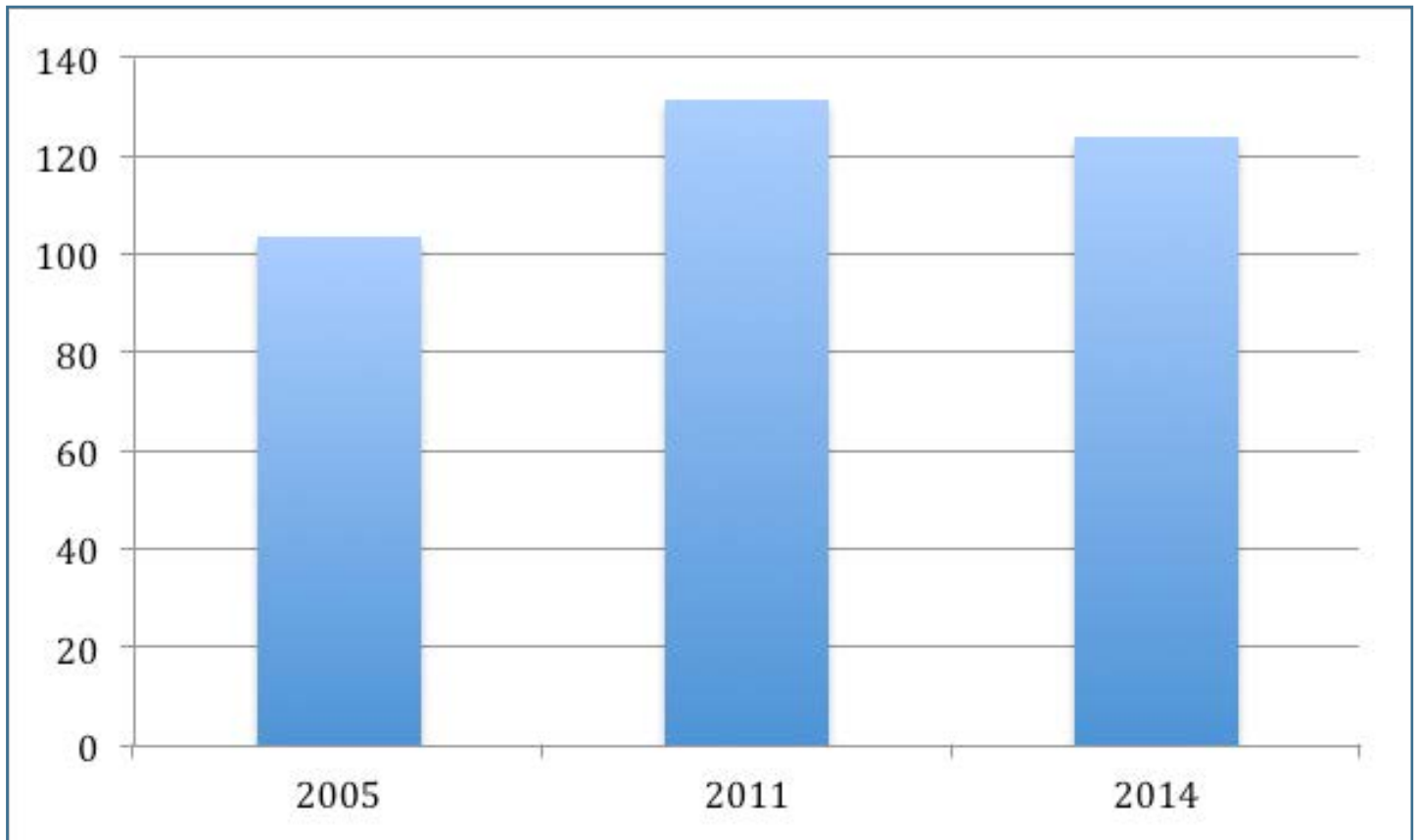


## PROPERTY VALUES

Property values on the Sunshine Coast followed similar trends as other coastal regions, increasing in the earlier portion of the study period then flatlining and even declining in more recent years.

According to the MLS, property values on the Sunshine Coast increased from its Home Price Index (HPI®) of 1.3.6 in May 2005 to a high of 131.3 in April 2011 – an increase of 27.7%. This was followed by a slight decline of 7.7% from April 2011 to May 2014.

**Figure 65:** Property Values – Sunshine Coast

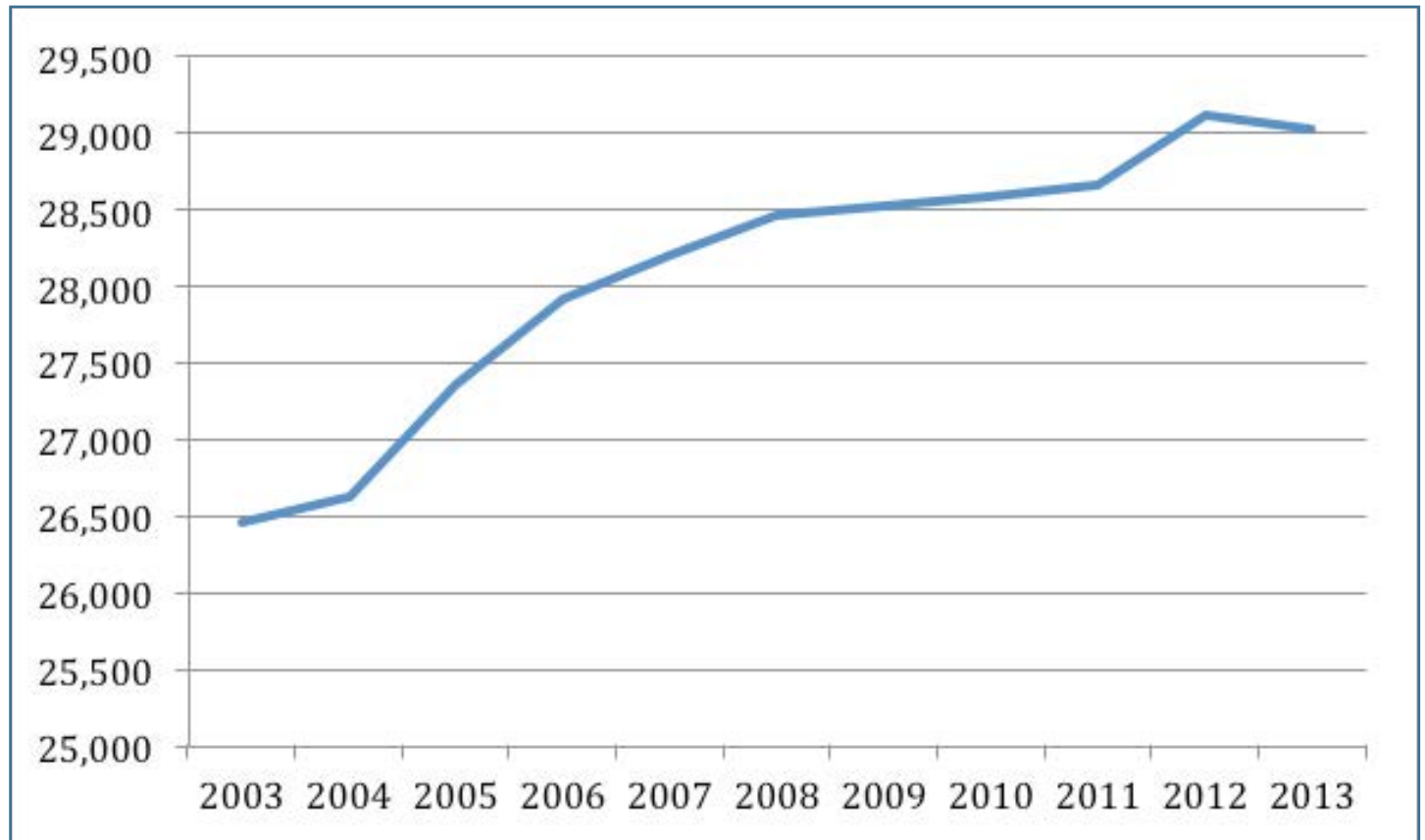




## POPULATION CHANGES

The population of the Sunshine Coast has increased over the period 2003-2013, however the majority of this increase occurred from 2003-2008. Since 2012 the population has declined slightly.

Figure 66: Population Trend – Sunshine Coast



## END NOTES

- i* Michael Bennion, for Washington State Department of Transportation, “A Comparison of Operational Performance: Washington State Ferries to Ferry Operators Worldwide,” June 2010  
<http://www.wsdot.wa.gov/research/reports/fullreports/750.1.pdf>
- ii* Government of British Columbia, “Coastal Ferries Engagement Plan,” p. 2. Fall 2013.  
<http://www.coastalferriesengagement.ca>
- iii* Hotel News Now, “Comparing Customer Satisfaction Across Sectors,” October 2012,  
<http://www.hotelnewsnow.com/Article/9096/Comparing-customer-satisfaction-across-sectors>
- iv* Different organizations account for farebox recovery with different methods, with some using all revenue sources and others using only tariff revenues (from fares). Capital costs should not be included in farebox recovery calculations. The estimate for BC Ferries in Bennion (Ibid.) for BC Ferries appears to include capital costs, despite the report defining farebox recovery as being only tariff revenue as a percentage of operating expenses. Farebox recovery rates of other operators that were not taken from the Bennion report used tariff revenue as a percentage of operating costs (excluding capital).
- v* Bennion, op. cit., p. 58.
- vi* New Zealand Ministry of Transport, “Access to the transport system: Accessibility of public transport – AM023 Farebox Recovery Rates: National Totals,”  
<http://www.transport.govt.nz/ourwork/tmif/accesstothetransportsystem/am023/>
- vii* Bennion, op. cit., p. 58.
- viii* Washington State Ferries, “FY2012 Route Statements,”  
<http://www.wsdot.wa.gov/NR/rdonlyres/E1B562C1-D1A9-41CD-A9A9-AF5815BF2DD4/0/RouteStatementsAndAnalysis20072012Final.pdf>
- ix* Wikipedia, “Farebox Recovery Ratio,”  
[http://en.wikipedia.org/wiki/Farebox\\_recovery\\_ratio](http://en.wikipedia.org/wiki/Farebox_recovery_ratio)
- x* Wikipedia, Ibid.
- xi* Bennion, op. cit., p. 58.
- xii* BC Transit, “Annual Report 2012/13,”  
[http://www.bcbudget.gov.bc.ca/Annual\\_Reports/2012\\_2013/pdf/agency/bctransit.pdf](http://www.bcbudget.gov.bc.ca/Annual_Reports/2012_2013/pdf/agency/bctransit.pdf), p. 1.
- xiii* Bennion, op. cit., p. 58.
- xiv* Washington State Ferries, “FY 2012 Route Statements,” p. 2.  
<http://www.wsdot.wa.gov/NR/rdonlyres/E1B562C1-D1A9-41CD-A9A9-AF5815BF2DD4/0/RouteStatementsAndAnalysis20072012Final.pdf>
- xv* Washington State Ferries, Ibid., p. 3.
- xvi* Sources: Highway traffic data are taken directly from the BC Ministry of Transportation Traffic Data Program, at <http://www.th.gov.bc.ca/trafficData/>. Airport volumes are from published



Annual Reports of Vancouver International Airport ([www.yvr.ca](http://www.yvr.ca)), Victoria International Airport ([www.victoriaairport.com](http://www.victoriaairport.com)), and Comox Valley Airport ([www.comoxairport.com](http://www.comoxairport.com)).

- xvii* Source: BC Ministry of Transportation, direct communication (April 2014).
- xviii* This analysis updates the comprehensive analysis of the “Oceans Sector Economy” in British Columbia. See Glislason et al., “Economic Contribution of the Oceans Sector in British Columbia,” April 2007. The report uses the Statistics Canada Provincial Input-Output Model (2003) which has similar economic multipliers as the current BC Stats multipliers (2004) in use. These multipliers will have changed in the past ten years, though the analysis still provides relatively reliable estimates beyond an order of magnitude level. This analysis should be updated with the release of the BC Stats I/O Model, which will use multipliers from 2010 economic indicators.
- xix* Statistics Canada, “Travel Survey of Residents of Canada,” June 2014.  
<http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=3810>
- xx* Statistics Canada, “International Travel Survey,” June 2014.  
<http://www.statcan.gc.ca/eng/survey/household/3152>
- xxi* Economic Planning Group, “BC Ferries: Economic Impact Analysis,” p. ii, September 2000. (Prepared for BC Ferries Strategic and Corporate Planning Department).  
<http://foi.bcferrries.com/2014-063-responsiverecord.pdf>
- xxii* Destination British Columbia, “Regional Tourism Profile – Vancouver Island,” April 2013.  
[http://www.destinationbc.ca/getattachment/Research/Research-by-Region/Vancouver-Island/RegionalProfiles\\_Vancouver-Island.pdf.aspx](http://www.destinationbc.ca/getattachment/Research/Research-by-Region/Vancouver-Island/RegionalProfiles_Vancouver-Island.pdf.aspx)
- xxiii* BC Stats, “Estimating the Size of British Columbia’s Tourism Sector,” p. 14. , 2009.  
<http://www.bcstats.gov.bc.ca/Files/1a9ce086-a0e0-4e48-9e38-70fdee3c58a2/MeasuringtheSizeofBritishColumbiasTourismSector.pdf>
- xxiv* Vancouver Island travel patterns and expenditures are used in these economic impact estimates because the majority of ferry travellers are travelling to or from the Vancouver Island region, which includes the Gulf Islands and some regions of the Georgia Strait North.
- xxv* It is recognized that some travellers will only take one ferry if they use different modes of transport to enter and/or exit a ferry dependent community, (e.g., taking a ferry to Vancouver Island then flying out of Victoria), and some will take more than two ferries for each travel event, particularly those visiting and/or departing from Minor Route communities.
- xxvi* It should be noted that Experience Cards are not used on the Major Routes. The estimates assume that the proportion of discretionary traffic (non E-card users) is the same on the Majors and the Minors.
- xxvii* For these estimates, Ontario’s Tourism Regional Economic Impact Model (TREIM) is used. <http://www.mtc.gov.on.ca/en/research/treim/treim.shtml>. Due to the similarities in the structure of the two province’s tourism sectors, particularly the ratios of industry group revenues to total sector revenues, as well as similar compensation structures, the TREIM

was utilized for this analysis. The TREIM also uses more current data sources than British Columbia's I/O model (TREIM data have been updated with 2009 ITS and TSRC data). To validate these estimates, a subsequent run of these figures should be undertaken with the BC Stats I/O Model, which was being updated at the time of report development.

- xxviii** United States Transportation Research Board, "Guidebook for Assessing the Social and Economic Effects of Transportation Projects," 2001, p. 3.
- xxix** BC Stats, in constant 2007 dollars. Note that forestry and logging GDP excludes wood products manufacturing and pulp & paper manufacturing.
- xxx** Taxation impacts are estimated using ratios established through the BC Input-Output Model, from Destination BC, "Economic Value of the Commercial Nature-Based Tourism Industry in British Columbia," September 2004.  
[http://www.destinationbc.ca/getattachment/Research/Research-by-Activity/Land-based/Economic\\_Impacts\\_of\\_Commercial\\_Nature-Based\\_Tourism\\_Report-sflb.pdf.aspx](http://www.destinationbc.ca/getattachment/Research/Research-by-Activity/Land-based/Economic_Impacts_of_Commercial_Nature-Based_Tourism_Report-sflb.pdf.aspx)
- xxxi** See Seaspan Coastal Intermodal Company, "Response to British Columbia Ferry Service Inc's Submission to the BC Ferry Commissioner Regarding Section 45.1(1) of the Coastal Ferry Act and Drop-Trailer Service," p. 14, November 26, 2010.  
[http://www.bcferrycommission.com/wp-content/uploads/2011/05/s43-69/s45-SCIC\\_Submission\\_to\\_BCFC\\_2010-11-26.pdf](http://www.bcferrycommission.com/wp-content/uploads/2011/05/s43-69/s45-SCIC_Submission_to_BCFC_2010-11-26.pdf)
- xxxii** BC Stats, "Consumer Price Index latest monthly periodical, Highlights," April 2014,  
<http://www.bcstats.gov.bc.ca/Files/498df2fa-75fc-48ce-aa1c-eaf6dfe3dcef/ConsumerPriceIndex-HighlightsApril2014.pdf>
- xxxiii** Wikipedia, "Price elasticity of demand,"  
[http://en.wikipedia.org/wiki/Price\\_elasticity\\_of\\_demand](http://en.wikipedia.org/wiki/Price_elasticity_of_demand).
- xxxiv** Mark P. Pritchard, "Tourist price sensitivity and the elasticity of demand: The case of BC ferries," in e-Review of Tourism Research Vol. 1, No. 4, 2003.  
[http://ertr.tamu.edu/files/2012/09/275\\_a-1-4-4.pdf](http://ertr.tamu.edu/files/2012/09/275_a-1-4-4.pdf)
- xxxv** Bennion, op. cit., p. 32.
- xxxvi** InterVISTAS Consulting, "Performance Term 3 Forecast and Measurement of Demand Elasticity for British Columbia Ferry Services Inc.," May 2011.  
<http://www.bcferrycommission.com/wp-content/uploads/2011/07/InterVISTAS-Traffic-forecast-report-for-BCFS.pdf>
- xxxvii** Elasticities are adjusted for inflation and GDP. Price increases are based on the published fare index of the BC Ferry Commissioner, except for individual routes, for which data is from the Ferry Advisory Committee Chairs.
- xxxviii** This assumes no major change in other factors such as population, incomes, and total GDP. It also adjusts prices based on inflation and income (represented by GDP).
- xxxix** As noted in the InterVISTAS report (2011, op. cit.) using regression analysis for projections can be made more challenging by "simultaneous equations" issues, wherein changes in one



variable (say, price) may alter another variable (demand), which could lead to alteration in the future supply and therefore demand and price. This can be ameliorated using 2-Stage Least Squares (2SLS) regression analysis. Due to time and resource limitations for the development of this report, a 2SLS analysis was not undertaken. It is recommended that such analysis be undertaken in the future.

- xi* All estimates derived from the Tourism Regional Economic Impact Model (TREIM), op. cit.
- xli* TRB, op. cit., p. 3.
- xlii* Sylvain Acket et al, “Measuring and Validating Social Cohesion: a Bottom-up Approach.” Presented at the International Conference on Social Cohesion and Development, organized by the OECD, Development Center, Paris, January 2011.  
<http://www.oecd.org/dev/pgd/46839973.pdf>
- xliii* BC Stats, “Business Formations and Failures – Incorporations,”  
<http://www.bcstats.gov.bc.ca/StatisticsBySubject/Economy/BusinessFormationsandFailures.aspx>



