

Coastal Ferry Services Review: Climate Action Analysis

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Cover Photo: Illustration of a new hybrid diesel-electric ferry BC Ferries expects to be in service by 2020 in the northern Gulf Islands. The design allows for future expansion of the on board battery capacity to permit plug in electric operation.¹ Photo Source: www.bcferrries.com/about/projects/bc-ferrries-newest-class-of-vessels.html

¹ BC Ferries media release (June 6, 2017) BC Ferries Awards Contract for Two New Minor Vessels www.newswire.ca/news-releases/bc-ferrries-awards-contract-for-two-new-minor-vessels-626789591.html

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Summary

This report is intended to contribute analysis and information to the Coastal Ferry Services Review regarding how BC Ferries can serve the public interest by contributing to meeting B.C.'s greenhouse gas (GHG) reduction goals.

The B.C. Government recently asserted that "climate change is the greatest challenge of our generation," and in May 2018, introduced legislation to set new GHG reduction targets of 40% below 2007 levels by 2030 and 60% by 2040. The transportation sector is responsible for almost 40% of B.C.'s inventoried GHG emissions.

B.C. Ferries plays an important role in B.C.'s multi-modal transportation network. While many people arrive at BC Ferries terminals in private motor vehicles, a significant proportion of BC Ferries passengers get to and from the terminals on public transit. Others ride bicycles, ride on long distance highway buses, take taxis and even walk to and from terminals.

A key question for this report is if the present model under which BC Ferries operates allows it to effectively contribute to network-wide GHG emissions reduction and to effectively reduce GHG emissions from its own operations.

Importance of Coordination

B.C.'s Auditor General contributed to a recent joint report of Auditors General from across the country on climate action, which details widespread failures to meet past GHG reduction targets. The report, *Perspectives on Climate Change Action in Canada—A Collaborative Report from Auditors General*, asserts that a lack of coordination and contradictory policies are common problems. The Auditors General also recommend that the agency leading GHG reduction efforts be given the resources and authority needed to be effective.

An example of contradictory policies is that Metro Vancouver Regional District (MVRD) plans emphasize transit, walking, and cycling along with compact development patterns as ways to reduce greenhouse gas emissions from transportation. However, past provincial policies favored major road expansion projects that increase sprawl and GHG emissions. The conflict is illustrated by the MVRD vote to oppose the replacement of the four-lane Massey Tunnel with a ten-lane bridge (which is presently on hold and under review).

Climate Action

It is widely accepted that shifting travel to modes that emit less GHGs per passenger kilometre is an essential component of climate action plans, and the Government of B.C. signed on to the *Pan-Canadian Framework on Clean Growth and Climate Change* which includes a commitment to "shift from higher to lower-emitting types of transportation." A large modal shift to public transit would affect BC Ferries operations, and the outcome is much more likely to be positive if anticipated and planned for.

Shifting to low-emissions energy sources for vehicles and equipment is also an important part of any climate action strategy, and electricity seems to be becoming the dominant low-GHG energy source for most applications. Rapid reductions in the price of batteries and the scaling up of electric vehicle and component manufacturing means that widespread adoption of electric vehicles is now much more economical than even three years ago.

It has also recently become cost effective to run many ferries on electricity. European ferry operators are claiming impressive cost savings and deep GHG emissions reductions from plug in battery electric ferries, and both new electric ferries and conversions of existing ferries are on order. BC Ferries is investigating the feasibility and economics of electrifying at least some routes, and the latest ferries on order are designed for conversion to plug in electric.

Some energy sources have higher lifecycle GHG emissions than manufacturers claim. Recent research into overall methane emissions from liquefied natural gas (LNG) has cast real doubt on even the modest lifecycle GHG reductions claimed by suppliers. BC Ferries is planning to retrofit the large Spirit Class ferries to run on LNG. Investing heavily in converting ferries to LNG might meet a short term target (perhaps based on overly optimistic lifecycle GHG values) when conversion to battery electric power is needed to meet longer term targets.

Considering multiple benefits

As the Auditors General of B.C. and Canada have established, the primary benefit of GHG reduction is in reducing the overwhelming economic, social and environmental costs of unmitigated climate change. However, in the transportation sector many GHG reduction actions have co-benefits so large that the actions would be worthwhile even without the GHG reduction benefits. Benefits include health, affordability, and quality of life.

The Government of B.C. is in the process of developing a new climate action plan, and has indicated that the new plan will consider multiple objectives including “maximizing job and economic opportunities.” In B.C., the employment and economic development benefits of carefully designed GHG reduction measures in the transportation sector could be very substantial.

A carefully designed effort to prioritize transit, cycling and walk-on connections to BC Ferries terminals could also reduce the number of people traveling with vehicles left behind by full ferries.

BC Ferries governance model and climate action

BC Ferries operates independently of the provincial government, and is guided by the Coastal Ferry Act and the Coastal Ferry Services Contract. Neither the Act nor Contract seem to give BC Ferries a clear mandate to consider the public interest in GHG reduction. BC Ferries seems to need three things to act effectively in the public interest with regard to GHG emissions:

- 1) A clear mandate. For example the Coastal Ferry Act and/or the Coastal Ferry Services Contract could be amended to include consideration of the public benefit in reducing GHG emissions.
- 2) A way to fund GHG reduction initiatives. For example, incentives provided by Government (through a Coastal Ferry Services Contract amendment or separately).
- 3) A coordinating agency with the authority needed to get multiple provincial ministries and agencies working in concert.

Illustrative Examples

There are many actions BC Ferries could take to reduce GHG emissions and produce co-benefits. This report includes illustrative examples divided into four categories: Reducing direct emissions, shifting to low-GHG modes, facilitating electric vehicles, and other actions.

Key Recommendations

This report includes a set of key recommendations including providing BC Ferries with a clear mandate to consider the public interest in reducing GHG emissions, and ensuring that the provincial agencies BC Ferries will need to cooperate with have complementary mandates. Another is to create a coordinating agency to lead GHG reduction efforts in the transportation sector.

The immediate actions recommended are for BC Ferries to review all major planned capital expenditures, and for Government to review all major capital expenditures planned for highway routes connecting to BC Ferries terminals, in light of B.C.'s GHG reduction targets.

Conclusion

The Government of B.C. has committed to producing a climate action plan for the transportation sector in the fall of 2018. This new plan has a much better chance of succeeding thanks to the Auditors General's guidance. However, there are decisions that don't need to wait for a new climate plan. Every month that BC Ferries continues without a clear climate action mandate is a month spent drifting, rudderless, when real progress is urgently needed.

Introduction

Climate analysis in Coastal Ferry Services Review

This report is intended to contribute analysis and information to the Coastal Ferry Services Review regarding how the coastal ferry system and BC Ferries can best contribute to meeting B.C.'s greenhouse gas reduction targets.

The objectives of the Coastal Ferry Services Review include ensuring “that the model is operating in the public interest.” As documented in this report, the Government of British Columbia has determined that meeting their greenhouse gas (GHG) reduction targets is very much in the public interest.

Since the transportation sector is responsible for almost 40% of B.C.'s inventoried GHG emissions, and BC Ferries routes are crucial components of B.C.'s transportation system, examining BC Ferries' potential role in reducing GHG pollution is important for meeting B.C. GHG reduction targets. There are also other public interest factors, such as public health, and employment and affordability, which can be improved by the same measures that reduce GHG emissions from transportation.

B.C. Government's climate commitment and GHG reduction targets

The B.C. Government response to the Auditor General of B.C.'s climate audit, which was released in February 2018, states:

“Climate change is the greatest challenge of our generation. It is felt in British Columbia and around the world, affecting almost all aspects of our lives. We agree with the Auditor General that acting on climate change . . . is necessary now and will require a concerted effort for the foreseeable future.”²

In May 2018, the B.C. Government introduced legislation to set new GHG reduction targets of 40% below 2007 levels by 2030, 60% below 2007 levels by 2040, and leaving the 80% reduction by 2050 target unchanged.

The Government of B.C. has stated an overwhelming public interest case for all agencies of government working together in a concerted way to meet the 2030, 2040 and 2050 GHG reduction targets.

² Managing Climate Change Risks: An Independent Audit. www.bcauditor.com/pubs/2018/managing-climate-change-risks-independent-audit (p 17)

BC Ferries' role in multi-modal network

B.C. Ferries plays an important role in B.C.'s multi-modal transportation network. While many people arrive at BC Ferries terminals in private motor vehicles, a significant proportion of BC Ferries passengers get to and from the terminals on transit provided by BC Transit and TransLink. Others ride bicycles, ride on long distance highway buses, take taxis and walk to and from terminals. Even at the more northern BC Ferries terminals some passengers connect to modes other than the private automobile, such as water taxis and long-distance highway buses.

Transit ridership is highest at Metro Vancouver locations, but is significant even at fairly rural locations such as Salt Spring Island and the southern part of the Sunshine Coast. At peak travel times, considerably more people traveling with their vehicles would have to wait for the next sailing if public transit service and other options did not exist.

One of the most common actions in GHG reduction plans is prioritizing low carbon modes such as public transit, walking and cycling over private automobiles. B.C. Ferries, along with many other organizations, make decisions that amount to prioritization of different transportation modes. The modes that are improved, or made relatively less expensive, are to some degree the modes that people will choose to use. If BC Ferries prioritizes connections with low carbon modes, it will make B.C.'s overall efforts more effective.

Another common action in GHG reduction plans is encouraging low GHG emission vehicles, such as electric cars and trucks. A successful vehicle electrification program will likely require charging stations at locations, such as ferry terminals, where vehicles on longer trips can charge while stopped for other reasons.

Many agencies make decisions that impact the GHG emissions from transportation, and a key question for this report is if the present model under which BC Ferries operates allows it to effectively contribute to network-wide GHG emissions reductions. The ability of BC Ferries to effectively reduce direct GHG emissions from its own operations under the present model is also an important, and interconnected, issue.

Importance of Coordination

Auditors General detail failures of coordination in Canadian GHG reduction efforts

In February 2018 the Auditor General of B.C., Carol Bellringer, published *Managing Climate Change Risks: An Independent Audit*. In the introduction, the Auditor General states that:

“Climate change is one of the greatest challenges the world is facing. Over the past months, natural disasters have made headlines across the globe. Here in B.C., we too, are already feeling the impacts of climate change. The summer of 2017 saw wildfires

burning across the province, breaking records for the greatest number of hectares burned. This past spring, heavy rains combined with the snowmelt and flooded the Okanagan.

These events highlight the environmental, economic and social threats that climate change poses to the province.”

The Audit also bluntly concludes that “Government has not taken adequate action to meet provincial emission reduction targets.”³

Only two months later, the Auditor General of Canada along with Legislative Audit Offices from provinces including B.C. published the report *Perspectives on Climate Change Action in Canada—A Collaborative Report from Auditors General*. This unprecedented report also starts by defining climate change as an economic, social, and environmental issue, and asserts that “Governments across Canada consider climate change a defining challenge of the 21st century.”(p3). The finding that climate change is an economic, social and environmental threat means that climate change is not an ‘environmental’ problem that can be balanced off against social and economic factors – climate change is a major threat in all three categories.

Prominent in the Auditors General’s list of key issues is the lack of coordination leading to problems including contradictory policies:

Audits at federal, provincial, and territorial levels found that there was limited coordination within governments around climate change action. . . . In many cases, limited coordination led to an ad hoc response to climate change. Without effective coordination, governments might overlook important opportunities or challenges, or develop redundant or contradictory policies (p 5).

Auditors General recommendations on coordination and authority

The Auditor General of B.C.’s audit touches on the question of coordination between different ministries and agencies:

“Our document review and interview evidence demonstrated the importance of considering policies and actions as a group (not independently). Policies and actions can work on different timescales and impact each other. This highlights the importance of having a complementary suite of policies that can reinforce and build upon each other” (95).

³ *Managing Climate Change Risks: An Independent Audit* (p 9) www.bcauditor.com/pubs/2018/managing-climate-change-risks-independent-audit

However, the collaborative report from Auditors General from across the country which incorporated findings from the B.C. audit examines the question of coordination in more detail. Rather than a list of recommendations, the Auditors General raise critical questions aimed at resolving coordination problems, as well as improving monitoring and reporting:

“Most auditors across the country found that there was limited coordination among government departments and agencies, and where included in the audit scope, between provinces or territories and local governments. Without effective coordination, government responses to climate change may be ad hoc and inefficient.

- How will governments ensure that all the relevant players are involved in developing climate change strategies?
- How will governments ensure that lead departments on climate change are given the resources and authority they need to provide leadership to other departments and agencies?
- How will governments ensure that policies within different jurisdictions are complementary rather than redundant or contradictory?

Monitoring and reporting

Auditors found that governments were often not monitoring their progress on climate change and not reporting regularly to the public on that progress.

- What steps will governments take to regularly keep the public informed of their progress toward meeting their climate change commitments?
- What measures will governments use to assess their progress?” (26)

One of the positive examples of coordination in the report is the inclusion of “roles and responsibilities of departments and corporations” in Yukon’s climate plan (14). The Auditors General also noted that in Ontario the “Ministry of Environment and Climate Change was the lead for coordinating and reporting on the progress of climate change initiatives, but it did not have the authority to require ministries to take specific actions to reduce emissions” (20).

The Auditors General have provided Government with a solid framework with which to assess any GHG reduction effort in the transportation sector, including the specific case of BC Ferries.

Multi-modal coordination

B.C. has an apparent problem with lack of coordination for GHG reduction in the transportation sector, at least in Metro Vancouver. And BC Ferries’ busiest routes connect to Metro Vancouver’s transportation network.

Both the Metro Vancouver Regional District and the Capital Regional District have transportation and land use plans that emphasize transit, walking, and cycling along with

compact development patterns as ways to reduce greenhouse gas emissions from transportation (it is well established that urban highway expansion leads to increased vehicle travel, automobile dependent sprawl, and increased GHG emissions).⁴ However, past provincial policies (and those of some municipalities) seemed to be going in the opposite direction, with major road expansion projects that increase sprawl and GHG emissions still being funded. As discussed above, the Auditors General recent report found that contradictory policies like these are common in Canada and are a major contributor to past failures to reach GHG emission targets.

The problem is illustrated by the conflict between the Metro Vancouver Regional District (MVRD) and past provincial governments over transportation infrastructure priorities. The MVRD Board voted to oppose both the Port Mann Bridge / Highway 1 expansion and the proposed replacement of the four-lane Massey Tunnel with a ten-lane bridge (which is presently on hold and under review). In both cases the MVRD proposed that public transit should be a higher priority than these urban highway expansion projects.

Climate action in B.C.'s multi-modal network

Prioritizing low GHG transportation modes

It is widely accepted that shifting travel to modes that emit less GHGs per passenger kilometre is an essential component of climate action plans. Targets for mode share and limiting or reducing vehicle kilometres traveled (VKT) by private automobile are common.

TransLink's current plan acknowledges that spending on general purpose capacity expansion to the Major Road Network (MRN) in Metro Vancouver would increase VKT and GHG emissions and undo some the GHG reductions from transit improvements.⁵ The business as usual version of the plan forecasts a slight increase in GHG emissions over the next decade as a result. However, MRN funds don't have to be spent on general purpose capacity expansions, and can be spent instead on things that effectively reduce VKT and GHG emissions, such as bus lanes, bus ways and protected bicycle lanes.⁶ If a slight increase in GHG emissions is to be changed

⁴ E.g. Clark Williams-Derry (2007) *Increases in greenhouse-gas emissions from highway-widening projects*. Sightline Institute. www.jtc.sala.ubc.ca/reports/analysis-ghg-roads.pdf

⁵ General purpose lanes are lanes open to use by all types of vehicles including cars and light trucks occupied by only the driver (single occupant vehicles).

⁶ TransLink Mayors' Council (2015). *Regional Transportation Investments: a Vision for Metro Vancouver* www.translink.ca/-/media/Documents/about_translink/governance_and_board/mayors_vision/mayors_council_vision_mar_2015.pdf Appendices https://www.translink.ca/-/media/Documents/about_translink/governance_and_board/mayors_vision/mayors_council_vision_appendices_june_2014.pdf

into a decisive downwards trajectory as required to meet provincial climate targets, it will be necessary to get VKT trending downwards as well.

The Government of B.C. signed on to the *Pan-Canadian Framework on Clean Growth and Climate Change* in 2016. The *Framework* commits the federal and provincial governments to "shift from higher to lower-emitting types of transportation, including through investing in infrastructure." Examples of this shift include shifting from private motor-vehicles to transit and cycling as well as shifting freight from trucks to rail. Implementing this provision of the *Framework* could, depending on how the funds are allocated, produce a decided downward trend in VKT and a very sharp upward trend in urban transit and longer-distance highway bus ridership.⁷

The Canadian Centre for Policy Alternatives report *Transportation Transformation: Building complete communities and a zero-emission transportation system in BC* suggests that over one billion dollars per year could be re-allocated to low-carbon modes in B.C.⁸ Canadian transportation authors Richard Gilbert and Anthony Perl suggest that reducing spending on highway and airport expansion is as important as increasing spending on low carbon transportation, asserting that spending on both at the same time is "analogous to applying a car's accelerator and brake at the same time".⁹

A large modal shift to transit would affect BC Ferries operations and finances, regardless of if BC Ferries is planning for, and contributing to, the shift or not. Similarly, a shift to autonomous vehicles (self-driving cars) could greatly increase the proportion of foot passengers traveling on BC Ferries and reduce the number of passenger vehicles carried. The outcome is much more likely to be positive if these shifts are anticipated and planned for.

Decarbonization through electrification - road vehicles and ferries

Shifting to low-emissions energy sources for vehicles and equipment is an important part of any climate action strategy in the transportation sector, and electricity seems to be becoming the dominant low-GHG energy source for most applications.¹⁰ Rapid reductions in the price of

⁷ One example of a measure that has the potential to quickly bring VKT down and transit ridership up is 24/7 bus lanes. See e.g. Eric Doherty (2016). "Let's follow Seattle's lead and create designated bus lanes"

<http://theprovince.com/opinion/eric-doherty-lets-follow-seattles-lead-and-create-designated-bus-lanes>

⁸ Patrick Condon, Eric Doherty, Kari Dow, Marc Lee & Gordon Price (2011)

www.policyalternatives.ca/transportationtransformation

⁹ Richard Gilbert and Anthony Perl (2010) *Transport Revolutions: Moving People and Freight Without Oil* (New Society Publishers) p 47

¹⁰ e.g. Andrew Rowe, Peter Wild and Bryson Robertson (Nov 13, 2017) Canada's Paris Agreement obligations means a herculean electrification effort. www.theglobeandmail.com/opinion/canadas-paris-agreement-obligations-means-a-herculean-electrification-effort/article36933939/; Pan-Canadian Framework on Clean Growth and Climate Change (2017) <https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework.html>

batteries and the scaling up of electric vehicle and component manufacturing means that widespread adoption of electric vehicles is now much more economical than even three years ago.¹¹ It now costs about the same to run high-usage urban vehicle such as taxis, transit buses and delivery vans on electricity as on fossil fuels.¹²

It has also recently become cost effective to run many ferries on electricity. European ferry operators are claiming impressive cost savings and deep GHG emissions reductions from electric ferries, and both new electric ferries and conversions of existing ferries are on order.¹³ Washington State Ferries is planning to convert their largest ferries to battery electric operation, pending funding from the state and federal governments.¹⁴

BC Ferries is already investigating the feasibility and economics of electrifying at least some routes in cooperation with engineers at the University of Victoria.¹⁵ BC Ferries recently ordered two diesel-electric hybrid ferries with a design that allows for future expansion of the on board battery capacity to permit plug in electric operation.¹⁶ Assessing the feasibility of electrification of each of BC Ferries routes is beyond the scope of this report, but most of the shorter routes are likely good candidates. Given that the European Union is now investigating the feasibility of converting ferry routes of over 3 hours duration, with the participation of Corvus Energy of Richmond B.C., it may become feasible to electrify most of BC Ferries' routes.¹⁷

It is important to note that some energy sources once touted as being low GHG have turned out to have higher lifecycle GHG emissions than manufacturers claimed. For example, much of the world's biodiesel supply may have lifecycle GHG emissions as high as or higher than conventional diesel fuel.¹⁸ Similarly, recent research into overall methane emissions from

¹¹ E.g. Jeremy Hodges (March 22, 2018) "Electric Car Costs Set to Fall: Batteries will become cheaper as production levels increase, technology improves" www.bloomberg.com/news/articles/2018-03-22/electric-car-costs-set-to-fall

¹² E.g. Small electric vans cost the same as dirty diesel ones today but are in short supply (2018) www.transportenvironment.org/press/small-electric-vans-cost-same-dirty-diesel-ones-today-are-short-supply

¹³ E.g. A new fleet of all-electric ferries with massive battery packs is going into production (2018) <https://electrek.co/2018/03/05/all-electric-ferries-battery-packs/>

¹⁴ Michelle Baruchman (May 4, 2018) Washington State Ferries plans to convert its biggest vessels to electric power. www.seattletimes.com/seattle-news/transportation/washington-state-ferries-plans-to-convert-its-biggest-vessels-to-electric-power/

¹⁵ Jody Paterson (April 27, 2018) Greener ships, cleaner ocean www.uvic.ca/news/topics/2018+knowledge-greener-ships-dong+news

¹⁶ BC Ferries media release (June 6, 2017) BC Ferries Awards Contract for Two New Minor Vessels www.newswire.ca/news-releases/bc-ferries-awards-contract-for-two-new-minor-vessels-626789591.html

¹⁷ Corvus Energy Media Release (April 3, 2018). *Stena Line and Callenberg select Corvus Energy for Battery-Powered Ferry*. <http://corvusenergy.com/stena-line-and-callenberg-select-corvus-energy-for-battery-powered-ferry>

¹⁸ Carl Meyer (April 30, 2018). *Canada's math may overlook carbon pollution from biofuels* www.nationalobserver.com/2018/04/30/news/canadas-math-may-overlook-carbon-pollution-biofuels; Transport & Environment (2016) *Globiom: the basis for biofuel policy post-2020* www.transportenvironment.org/sites/te/files/publications/2016_04_TE_Globiom_paper_FINAL_0.pdf

liquefied natural gas (LNG) has cast real doubt on even the modest lifecycle GHG reductions claimed by suppliers. In contrast, converting from fossil fuels to renewable electricity seems to produce impressive and verifiable GHG reductions, as long as the GHG footprint of the electricity is low as it is in B.C.¹⁹ BC Ferries uses some biodiesel, has new LNG ships in service, and is planning to retrofit the large Spirit Class ferries to run on LNG.

Costs of uncoordinated approach

As the Auditors General of B.C. and Canada have documented, an uncoordinated approach guarantees failure to reduce GHG emissions as required to meet B.C.'s 2030 target. However, it also means different parts of our multi-modal transportation network not working together efficiently. This entails financial costs on families, individuals, governments and private businesses.

One risk for BC Ferries is that it will not be prepared for a substantial modal shift from private automobiles to people arriving and departing via public transit, bicycle, and potentially autonomous vehicles (self-driving cars) providing taxi-like services.²⁰ Partially empty car decks combined with overcrowded foot passenger facilities would not be a positive outcome for passengers or BC Ferries.

Another risk of an uncoordinated approach is that efforts to meet short term GHG emissions targets could inhibit measures needed to meet longer term GHG targets. For example, investing heavily in converting ferries to LNG might meet a short term target (perhaps based on overly optimistic lifecycle GHG values) when conversion to battery electric power is needed to meet longer term targets.

An uncoordinated approach also means foregoing some of the multiple co-benefits of effective GHG reduction in the transportation sector.

Considering multiple benefits

As the Auditors General of B.C. and Canada have established, the primary benefit of GHG reduction is in reducing the overwhelming economic, social and environmental costs of unmitigated climate change. However, in the transportation sector many GHG reduction actions are *no regrets actions* with co-benefits so large that the actions would be worthwhile

¹⁹ Dr. Maarten Messagie (2014) Life Cycle Analysis of the Climate Impact of Electric Vehicles
www.transportenvironment.org/sites/te/files/publications/TE%20-%20draft%20report%20v04.pdf

²⁰ The future of autonomous vehicles is highly uncertain, but policy options are available to regulate and/or incentivize low GHG emission shared use vehicles over types that would increase traffic volumes. E.g. Jacques Leslie (January 8, 2018) *Will Self-Driving Cars Usher in a Transportation Utopia or Dystopia?*
<https://e360.yale.edu/features/will-self-driving-cars-usher-in-a-transportation-utopia-or-dystopia>

even without the GHG reduction benefits.²¹ Put another way, these actions have a negative or zero net cost per unit of GHG emission reduction.

The Government of B.C. is in the process of developing a new climate action plan, and has indicated that the new plan will consider multiple objectives including economic stability and diversification, and “maximizing job and economic opportunities.”²² In a province like B.C., which imports oil for transportation fuel and does not manufacture automobiles, the employment and economic development benefits of carefully designed GHG reduction measures in the transportation sector could be very substantial.²³

One of the primary benefits of shifting away from an automobile dependent transportation system is that it makes life more affordable. A good multi-modal network allows households to spend less on transportation. Some of this savings is from reduced operating costs, such as less gasoline and car maintenance. However, a big factor is that a multi-modal network including better transit allows people to live well with fewer cars and fewer parking spots.²⁴

The physical and mental health benefits of shifting away from a transportation system dominated by the automobile to a more multi-modal system are extremely important. The BC Healthy Living Alliance asserts that these health benefits “come from increases in physical activity and accessibility, and reductions in traffic congestion, injuries, localized air pollution and greenhouse gas emissions that contribute to climate change”.²⁵

Carefully designed GHG reduction strategies can also contribute to housing affordability, poverty reduction and accessibility of health services. The Canadian Centre for Policy Alternatives report *Transportation Transformation: Building Complete Communities and a Zero-Emission Transportation System in BC* proposes measures to enhance equality and quality of life while winning over the wide range of households who are dependent on cars for their mobility because they have ‘just played by the rules.’ This report details potential actions and co-benefits for smaller B.C. communities and rural areas, as well as suburban and urban areas.²⁶

²¹ E.g. Todd Litman (2017) *Win-Win Transportation Emission Reduction Strategies* www.vtppi.org/wwclimate.pdf

²² “Response from the Auditees” in *Managing Climate Change Risks: An Independent Audit* www.bcauditor.com/pubs/2018/managing-climate-change-risks-independent-audit. (17-18)

²³ Eric Doherty (2015) *Making the Most of the Transit Referendum: Transportation Investments to Create More Jobs and Reduce Pollution*. http://ecoplanning.ca/wp-content/uploads/2011/01/Make_Most_of_Transit_Report-FinalApril212015.pdf

²⁴ Todd Litman (2017) Victoria Transport Policy Institute. *Transportation Affordability Evaluation and Improvement Strategies* www.vtppi.org/affordability.pdf

²⁵ *BC on the Move – in a healthier direction* (no date) www.bchealthyliving.ca/bc-on-the-move-in-a-healthier-direction

²⁶ Patrick Condon, Eric Doherty, Kari Dow, Marc Lee & Gordon Price (2011) www.policyalternatives.ca/transportationtransformation

A carefully designed effort to prioritize transit, cycling and walk-on connections to BC Ferries terminals could also have benefits for people who need to bring their vehicles on board at busy times. If more people are travelling as foot passengers, then those traveling with vehicles are less likely to be left behind by a full ferry.

BC Ferries is considering battery electric propulsion for their vessels, and is a member of Green Marine which considers underwater noise to be a serious concern in areas where marine mammals are present.²⁷ Reduced underwater noise from converting to electric propulsion could be a significant co-benefit, considering endangered orca whales are often near BC Ferries' busiest routes. It may also be more economically advantageous for BC Hydro to sell electricity to BC Ferries than to export the same power.

Best practices for climate action and enhancing multiple benefits

The European iTransfer sustainable ferry travel initiative published a number of reports with many recommendations for good and innovative practices, including information on integrating ferries into public transit networks to facilitate mode shifts to transit from private passenger vehicles.²⁸

The Washington Maritime Federation's Maritime Blue initiative also provides an interesting vision of maximizing multiple benefits while reducing GHG emissions in the marine sector.²⁹

“Washington State will be home to the nation's most sustainable maritime industry by 2050. It will lead the country in the maritime shift towards decarbonization, clean technology innovation and best management practices that will support a strong maritime economy with living-wage jobs, a healthy environment and resilient communities.”

These resources provide many examples of what BC Ferries could contribute to reduce GHG emissions and maximize co-benefits. However, some actions could be inhibited by the operating model BC Ferries works within unless changes are made.

²⁷ BC Ferries Business Plan for the year ending March 31, 2018. (p22)

www.bcferrries.com/files/PDFs/2018_Business_Plan.pdf

²⁸ Sustainable ferry transport: delivering innovative passenger transport solutions across rivers and estuaries in the North Sea Region (2014)

http://archive.northsearegion.eu/files/repository/20140306180204_iTRANSFEBROCHURERE2014.pdf; iTransfer case study 11. Seamless transport solutions: through-ticketing system

http://archive.northsearegion.eu/files/repository/20141201190007_iTRANSFERCASESTUDY11-SEAMLESSTRANSPORTSOLUTIONSAW.pdf Note: The iTransfer project website is not active. Some documents are available from archive.northsearegion.eu

²⁹ www.maritimefederation.com/about-wa-maritime-blue.html

BC Ferries governance model and climate action

BC Ferries operates independently of the provincial government, and is guided by the Coastal Ferry Act of 2003. The provincial government provides funding to BC Ferries through the Coastal Ferry Services Contract, which sets routes and service levels. BC Ferries aptly describes the governance arrangement as “a complex legislative and economic regulatory framework.”³⁰ The Coastal Ferry Act specifies that BC Ferries should take a “commercial approach” to providing services. However, the Provincial Cabinet appoints a Ferry Commissioner whose role includes considering the public interest, from the point of view of ferry users and taxpayers.

Neither the Commissioner nor Boards of Directors of the B.C. Ferry Authority or British Columbia Ferry Services presently seem to have a clear mandate in the Coastal Ferry Act or the Coastal Ferry Services Contract to consider the public interest in GHG emissions reduction.³¹

BC Ferries has taken some good steps towards reducing direct GHG emissions from ferry operations under the present governance model. However, as the Auditors General have established, meeting B.C.’s 2030 GHG reduction target will require much more ambitious action.

It also seems crucial to consider the B.C. Auditor General’s direction to consider “policies and actions as a group (not independently)” (95). BC Ferries cannot be effective in reducing GHG emissions across B.C.’s transportation network if it acts in isolation. Multiple agencies will need to be similarly empowered and supported to act.

Taking the Auditors General’s findings into account, BC Ferries seems to need three things to act effectively in the public interest with regard to GHG emissions:

- 1) A clear mandate from Government. For example the Coastal Ferries Act could be amended to allow the Commissioner to consider the public benefit in reducing GHG emissions, and/or the Coastal Ferry Services Contract could be similarly amended.
- 2) A way to fund GHG reduction initiatives and actions. For example, incentives provided by Government (through a Coastal Ferry Services Contract amendment or separately) and/or revisions to the Coastal Ferry Act to provide authority to take actions beyond what would be a normal commercial approach.
- 3) A coordinating agency with the authority needed to get multiple provincial ministries and agencies working in concert, as well as having the resources to provide funding for significant initiatives and incentives.

³⁰ *Business Plan for the year ending March 31, 2018.* (p 5) www.bcferreries.com/files/PDFs/2018_Business_Plan.pdf

³¹ One way to provide BC Ferries with a climate action mandate would be to amend Section 38(1) of the Coastal Ferry Act regarding the role of the Commissioner, adding to the principles for the Commissioner to consider.

Prescribing exactly how this should be done is beyond the scope of this report. However, given the complexity of the multi-modal transportation network in B.C., it seems likely that a dedicated agency (perhaps a branch of the Climate Action Secretariat) will be needed to coordinate GHG reduction actions in the transportation sector. The B.C. Crown Corporations Secretariat of the 1990s might be a useful model to build on in creating this agency. The provincial agencies that BC Ferries will need to coordinate with, in a successful transportation network-wide GHG reduction effort, will include BC Transit (under Ministry of Transportation and Infrastructure) and TransLink (under Ministry of Municipal Affairs & Housing). Successful coordination is unlikely unless all these agencies also have the mandate and support to act decisively.

Illustrative Actions:

There are many actions BC Ferries could take to reduce GHG emissions and produce co-benefits. These illustrative examples are divided into four categories: Reducing direct emissions, shifting to low-GHG modes, facilitating electric vehicles, and other actions.

Reducing direct emissions

- Converting existing ferries to be capable of operating on ‘plug in’ electric power, starting with shorter routes and vessels due for major refits.
- Specifying that new ferries be ‘plug in’ electric, or at least designed for easy conversion to battery electric power. (Given the long life of new ferries, battery and/or hydrogen fuel cell electric power may become practical for even the longest BC Ferries routes).
- Working with BC Hydro to install charging facilities for ferries wherever practical, and to plan electricity grid upgrades where necessary for future charging facilities.
- Implementing energy efficiency measures, such as slower vessel travel speeds.
- Purchasing electric vehicles for BC Ferries’ fleet.
- Improving energy efficiency and converting space and water heating to electric power in BC Ferries terminals and other buildings.

Shifting to low-GHG modes

- Reducing foot passenger fares relative to vehicle fares, and eliminating extra charges for bicycles.
- Increasing the convenience of purchasing transit fares on BC Ferries vessels. This could start as simply as selling and advertising BC Transit and TransLink transit tickets and day passes on board. (BC Ferries already sells TransLink day passes on board larger ferries).
- Working with TransLink and BC Transit to better integrate fare payment systems and incentivise transit ridership. For example, making it possible to use TransLink’s Compass

Cards on BC Ferries and BC Transit or providing transit fare-free to the Canada Line in Richmond where there is a large bank of ticket / Compass Card machines.

- Working with other agencies to better integrate ferry, long distance bus, passenger train, and air travel reservations and ticketing (with the objective of making low GHG modes more appealing).³²
- Increasing the capacity and quality of foot passenger and transit facilities at terminals. For example, providing covered and sheltered areas for people waiting to purchase BC Ferries tickets and for people boarding transit buses.
- Working with BC Transit and TransLink to reduce waiting times for transit riders at terminals, for example by having some buses leave as soon as they are full rather than waiting for a scheduled departure time.
- Coordinating with the Ministry of Transportation and Infrastructure to improve transit priority measures, such as highway shoulder bus lanes, on congested routes connecting with ferry terminals.
- Improving the experience for people with disabilities and seniors traveling by bus and ferry, for example by reducing the walking-rolling distance between ferries and buses.
- Surveying passengers to determine what would make their transit-ferry trip better.
- Working in cooperation with other agencies to improve cycling routes from ferry terminals to destinations including transit exchanges. For example, from Tsawwassen Ferry Terminal to the Ladner Transit Exchange.
- Improve facilities for people riding bicycles in terminals and onboard ferries.
- Providing passenger-only ferry service in a way that increases the relative convenience of low GHG modes. For example, by alternating passenger-only and vehicle ferries on the same route (foot passengers would have twice the sailings to choose from).
- Planning to increase the passenger carrying capacity of ferries relative to capacity for vehicles.
- Setting goals for increasing the ratio of foot passengers to automobiles, and regularly reporting on progress.

Facilitating electric vehicles

- Installing electric charging facilities at ferry terminals, and creating an arrangement so people can charge vehicles, including buses and heavy trucks, while waiting to board ferries.
- Implementing incentives for electric vehicles use, such as discounted fares for all types of electric vehicles.

³² For discussion of shifts to efficient modes, including for short haul air travel see Richard Gilbert and Anthony Perl, *Transport Revolutions: Moving People and Freight Without Oil* (second edition, New Society Publishers 2010)

Other actions

- Exploring ways to reduce the GHG footprint of food served on BC Ferries.
- Making it easier for passengers to avoid using single use products, such as plastic water bottles. For example, by installing water fountains and water bottle filling stations.
- Auditing BC Ferries operations to find other ways to reduce the GHG footprint of operations.

Key Recommendations:

The Auditors General of Canada have provided Governments with a solid framework with which to assess any GHG reduction effort in the transportation sector, including the specific case of BC Ferries. Many of these recommendations are informed by the Auditors General's reports:

1) Mandate and Incentives:

- Government should provide BC Ferries with a clear mandate to consider the public interest in reducing GHG emissions, such as by amending the Coastal Ferry Act with regard to the role of the Commissioner and/or amending the Coastal Ferry Services Contract.
- Government should consider providing BC Ferries with incentives (through a Coastal Ferry Services Contract amendment or separately) and/or a mandate in the Coastal Ferries Act to enhance co-benefits of GHG reduction actions, including job creation and economic diversification. This could specifically apply to enhancing the capacity of B.C. shipyards and electrical technology companies to produce electric powered vessels and to convert existing vessels to plug in electric power.³³
- The Board of BC Ferries should give BC Ferries management a strong mandate to reduce direct GHG emissions from BC Ferries operations, and to cooperate with other agencies to reduce emissions across the transportation network.
- Government should ensure that the provincial agencies BC Ferries will need to cooperate with, BC Transit, TransLink, and the Ministry of Transportation and Infrastructure have complementary mandates and support.
- Government should ensure that BC Hydro is planning to meet the heavy loads associated with charging facilities for ferries at terminals, and can offer pricing and incentives more favorable than those available for fossil fuels, including LNG.³⁴

³³ An example of an existing electrical technology company is Corvus Energy of Richmond BC, which provides battery technology for electric drive ships worldwide. See www.corvusenergy.com

³⁴ BC Ferries has signed up for *Natural Gas for Transportation* funding from FortisBC for converting ferries to liquefied natural gas, an incentive authorized by BC Government regulation. BC Ferries Media Release (March 24, 2016) *BC Ferries awards contract for Spirit Class mid-life upgrades: Vessels to be converted to operate on liquefied natural gas (LNG)* www.bcferrries.com/bcferrries/faces/attachments?id=946922; Fortis BC (2014) *Instructions to*

2) Considering Multiple Benefits

- Techniques, such as multiple account evaluation, should be used to evaluate the multiple benefits and costs of different options in a way that is transparent and accessible to the public.

3) Coordinating Agency

- Government should create a coordinating agency to lead GHG reduction efforts in the transportation sector. This agency should be designed to address the coordination, capacity, and authority problems identified by the Auditors General.
- This agency should have an adequate number of qualified staff to support ministries and agencies including BC Ferries, the financial capacity to provide incentives and fund projects, and the authority to require action from ministries and agencies.
- This agency should be involved in monitoring progress on GHG reductions, and should make their findings public. This monitoring should include independent evaluations of claims regarding the lifecycle GHG emissions of fuels and energy sources.

4) Immediate Actions

- BC Ferries should review all major planned capital expenditures, in particular any new vessel purchases, major refits, and major work on terminals, in light of B.C.'s GHG reduction targets. The review should consider both direct emissions and the impact on emissions from the transportation network.
- Government should review all major capital expenditures planned for highway routes connecting to BC Ferries terminals in light of the need to reduce vehicle traffic volumes to meet B.C.'s GHG reduction targets.

Conclusion

BC Ferries does not yet have a clear mandate to serve the public interest by contributing to meeting B.C.'s greenhouse gas reduction goals. BC Ferries also presently operates in an environment of lack of coordination and conflicting policies. However, as the Auditors General report makes clear, this situation is not at all unusual in Canada.

The Auditors General have challenged governments across Canada to produce coordinated climate action, where multiple agencies of different types work in concert. This is not an easy task, but it is absolutely necessary. Success will not only result in GHG emissions declining year after year to meet B.C.'s targets, but also health, affordability, and economic development benefits. Failure is not an option, if the interests of younger people in B.C. are considered.

Applicants: Natural Gas for Transportation (NGT) Incentive Program
www.fortisbc.com/NaturalGas/Business/NaturalGasVehicles/Documents/Instructions_to_Applicants.pdf

The Government of B.C. has committed to producing a climate action plan for the transportation sector in the fall of 2018. It has a much better chance of succeeding thanks to the Auditors General's guidance. However, there are decisions that don't need to wait for a new climate plan. Every month that BC Ferries continues without a clear climate action mandate is a month spent drifting, rudderless, when real progress is urgently needed.