

Making the Most of the Transit Referendum

Transportation Investments to Create More Jobs and Reduce Pollution

A Beyond Fossil Fuels Discussion Paper from Tanker Free BC



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About the Author

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About Tanker Free BC

Tanker Free BC was founded in 2009 by a group of concerned citizens who discovered that tankers loaded with tar sands crude were passing through Vancouver Harbour. Since that alarming discovery we have worked to build a grassroots movement to protect our coast and keep Vancouver from being turned into a major tar sands shipping port.



About Beyond Fossil Fuels

Beyond Fossil Fuels is Tanker Free BC's ongoing project to explore ways of overcoming our society's addiction to fossil fuels, including tar sands oil. Going beyond fossil fuels means saying "yes" to projects that lead us in a new and better direction.



Photo credits: Cover – Eric Doherty; page 9 – TransLink; page 14 BC Ministry of Transportation and Infrastructure

Executive Summary

This discussion paper is set in the context of the 2015 Metro Vancouver Transit Referendum, but the concepts are applicable everywhere. Approving the referendum would be a significant step forward in terms of doing our part to reduce the local demand for oil and resulting carbon pollution. It would also mean less sprawl onto farmland and therefore more food security at a time when drought in California farming areas has become the new normal due to global warming.

Regardless of the outcome of this vote, much more will have to be done to reduce oil consumption and greenhouse gas pollution in BC's transportation sector. Road transportation in Metro Vancouver is responsible for more than five million tonnes of greenhouse gas pollution, more than half of the region's total.

Global warming and ocean acidification are both caused by burning too much fossil fuel. Interior communities in BC are already losing hundreds of jobs because of trees killed by the pine beetle, which is directly linked to rising temperatures. Burning fossil fuels, such as tar sands oil, has already made B.C. sea water so acidic that oysters often cannot reproduce. The biggest threat to livelihoods in B.C. now is the carbon pollution from burning fossil fuels.

To protect fisheries and forestry jobs, it is now essential to rapidly transition off fossil fuels

The transit Plan being voted on only projects a stabilization of carbon pollution from transportation, rather than the deep and rapid reduction needed. However, there is considerable flexibility in the Plan to enhance both pollution reduction and job creation.

More Jobs and Less Pollution

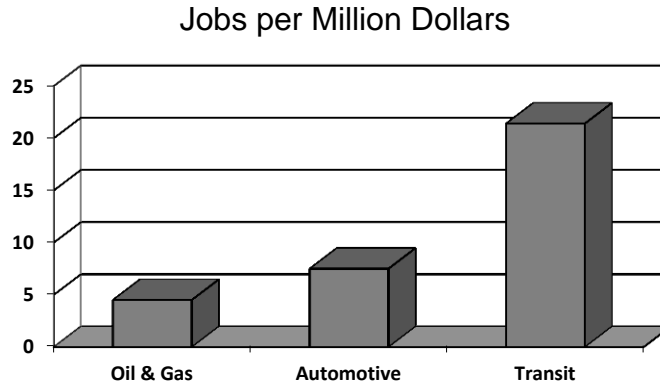
Jobs are an important consideration in building support for the necessary transition off fossil fuels. Luckily, improving public transit tends to improve employment prospects – particularly in a region such as western Canada that does not have a significant auto manufacturing sector. This is in stark contrast to the much lower numbers of jobs – largely family disrupting fly-in-fly-out jobs – produced by spending in the petroleum sector. The automotive sector and highway and road construction also result in relatively few jobs per dollar spent.

Therefore, taking steps to reduce fossil fuel consumption and carbon pollution are ways of enhancing the creation of good local jobs people can feel proud of.

Some steps to enhance job creation and pollution reduction include:

Shift Spending to Transit from Road and Fossil Fuel Infrastructure. Studies show that improving public transit is a better job creator than building new and wider roads or fossil fuel infrastructure, and the same or lower overall transportation expenditure can

produce more employment. For example, using BC Treasury Board figures, the Canadian Urban Transit Association estimates that a \$1 million transit expenditure creates 21.4 jobs in BC, compared to 7.5 jobs for the same automotive expense and only 4.5 jobs in oil and gas.



Source: CUTA (2003) Transit Means Business: The Economic Case for Public Transit in Canada

In Metro Vancouver, people spend about nine billion dollars every year to buy and operate private automobiles, including fuel costs. Even a small portion of this re-directed to other consumer expenditures such as restaurant meals would have a substantial positive effect on regional employment. The opportunity for people to work less with lower personal transportation expenses is also an important social and economic benefit to consider. A transportation system that forces people to work excessive hours in order to pay for automobiles and fuel to get to work is no recipe for sustainable prosperity or a healthy society.

Lower mainland residents can influence provincial priorities for the better, such as by pushing for better transit and improved highway maintenance instead of the controversial multi-billion dollar freeway bridge slated to replace the Massey Tunnel.

Invest in Immediate Transit Service Improvements. Capital investments in major rapid transit projects have considerable employment advantages over fossil fuel and automotive infrastructure. However, improving transit service by investing in the operations side, such as hiring more bus drivers to increase the frequency of service and provide more late night service have even greater employment benefits.

Residents can influence how Major Road Network funds are spent

Take Walking and Cycling Infrastructure Seriously.

Cycling and walking facilities are far more labour-intensive than road infrastructure. A World Health Organization study shows cycling producing four times as many jobs per million Euros as the car industry. The Mayors' Plan includes plans for enhanced sidewalks and pedestrian safety near transit routes, as well as protected bicycle lanes. In addition, using part of the \$200 million allocated in the Plan to Major Road Network capital to

improve facilities near major roads would have employment, health and environmental benefits. This choice is largely up to the municipalities where TransLink's 'Major Roads' are located, so residents can influence these decisions in their own communities.

Shift to Renewable Electricity. Spending on fossil fuels, such as diesel fuel, has among the worst jobs return of any sector. In contrast, renewable electricity is one of the better ways of creating jobs. And those jobs would mainly be here in BC, which has very good renewable electricity potential. Our region already has one of the largest fleets of electric trolley buses in North America. Many more of our bus lines, including B-line express buses could be converted to trolley bus.

Make Transit Vehicles Last. Most new buses and transit vehicles purchased for use in BC are manufactured outside of BC. However, even complete rebuilds of buses and rail vehicle can be done here in Metro Vancouver. For example, TransLink has been refurbishing older SkyTrain cars in Burnaby rather than buying more new cars manufactured in Mexico or Ontario.

Make our Roads and Bridges Last. Building new bridges and roads is a huge expense, and much of the expenditure often leaves the province or country to pay for imported materials and services from multinational corporations. In contrast, good maintenance and refurbishment of existing infrastructure produces more jobs, and those jobs are more likely to go to people who live in the region. Repair and refurbishment work on roads and bridges creates about 15 percent more jobs per dollar than new highways.

Buy Canadian Buy Local. Our neighbours in the US routinely require that public transit vehicles and materials be produced in country – and sometimes in the same state. If we are looking forward to the economy of the future, rather than the polluting fossil fuel industries of the past, supporting the Canadian public transit industry is essential.

Conclusion

Younger people have shown that they are not very interested in jobs in the fossil fuel sector, in part because of ethical considerations around climate. Everyone wants to be able to make a living doing something they feel good about, and governments have the opportunity to create many more good jobs people can feel proud of by making the right decisions about transportation infrastructure.

**Everyone
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As one of the most fashionable urban regions in the world and the "Gateway to the Pacific," we have the opportunity to frame a dialogue with the world's biggest carbon emitters in China, India and the US about how we can work together for climate solutions.

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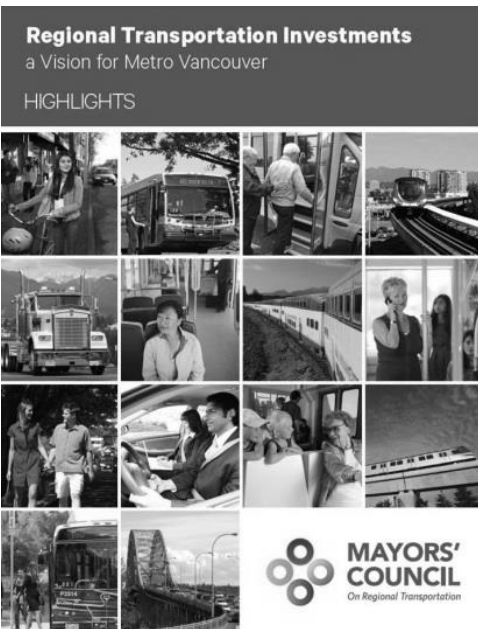


1 Introduction

This discussion paper is set in the context of the 2015 Metro Vancouver Transit Referendum, but the concepts and measures described are applicable to a wide range of locations and circumstances.

Metro Vancouver Referendum Context

In the US, transit funding referendums have become a fact of life. But the Metro Vancouver transit referendum is apparently the first ever in Canada.



The people of Metro Vancouver are being asked to vote Yes or No to increasing the provincial sales tax half a percent to fund a package of transportation measures assembled by the region's mayors. The Mayors' Plan is mainly about transit, but also includes road, pedestrian and cycling infrastructure as discussed in Section 2 below. In this report it is referred to as the Mayors' Transit Plan or the Plan rather than its formal title *Regional Transportation Investments: a Vision for Metro Vancouver*.¹

Approving the referendum would be a significant step forward in terms of doing our part to reduce the local demand for oil. It would also mean less sprawl onto farmland and therefore more food security at a time when drought in California farming areas has become the new normal due to global warming.

Carbon pollution threatens livelihoods in BC

Regardless of the outcome of this vote, much more will have to be done to reduce oil consumption and greenhouse gas pollution in BC's transportation sector. Road transportation in Metro Vancouver was responsible for more than five million tonnes of greenhouse gas pollution in 2010, more half of the region's total.² Province wide,

¹ (June 2014) http://mayorscouncil.ca/wp-content/uploads/2015/02/Mayors-Council-Vision-Document_June-2014.pdf

² Government of British Columbia (Feb 20, 2014), *2010 Community Energy & Emissions Inventory (CEEI)*, Metro Vancouver Regional District, www2.gov.bc.ca/gov/DownloadAsset?assetId=86FE4A1DD47A4B1A9AECA4ACCE74CE52&filename=ceei_2010_metro-vancouver_regional_district.pdf

tailpipe emissions from the transportation sector accounts for 38% of provincial greenhouse gas pollution.³ These totals do not include the significant upstream emissions from tar sands and other petroleum extraction and refining.

Global warming and ocean acidification are both caused by burning too many fossil fuels. Interior communities in BC are already losing hundreds of jobs because of trees killed by the pine beetle, which is directly linked to rising temperatures. Burning fossil fuels, such as tar sands oil, has already made B.C. sea water so acidic that oysters often cannot reproduce.

The near-term prospect of sea water so acidic it won't support commercial shellfish operations is already casting doubt on the wisdom of investing or starting a career in the shellfish industry. The economies of coastal communities are already being eaten away by the carbonic acid formed when carbon dioxide mixes with ocean water.

The biggest threat to livelihoods in B.C. now is the carbon pollution from burning fossil fuels. To protect fisheries and forestry jobs, it is now essential to rapidly transition off fossil fuels. Presently BC is headed in the wrong direction, with carbon pollution projected to increase rather than dropping sharply as required by provincial law.⁴

To protect fisheries and forestry jobs, it is now essential to rapidly transition off fossil fuels

Reducing our dependence on tar sands oil in Metro Vancouver is a significant local action we can take toward stabilizing the climate and ocean chemistry globally. Similar steps are being taken around the world. We must work together to reduce both the supply and the demand for fossil fuels.

As one of the most fashionable urban regions in the world and the "Gateway to the Pacific," we have the opportunity to frame a dialogue with the world's biggest carbon emitters in China, India and the US about how we can work together for climate solutions.

Concerns about the Mayors' Plan

There are some legitimate concerns about this plan, proposed to be paid for by a half percent increase in the sales tax, including that lower income people would pay more as

³ B.C. Greenhouse Gas Inventory 2012 (2014)

www2.gov.bc.ca/gov/topic.page?id=50B908BE85E0446EB6D3C434B4C8C106

⁴ E.g. Shawn McCarthy (March 23, 2015) "Greenhouse gas emissions: Who's responsible for climate policy in Canada?" *Globe and Mail*. www.theglobeandmail.com/news/politics/canadas-provinces-are-taking-the-the-lead-on-climate-but-should-they/article23583907/

a percentage than wealthier people. However, the Canadian Centre for Policy Alternatives (CCPA) suggests that the overall effect is progressive since lower income people benefit more from improved transit service. The CCPA also suggests making the overall package strongly progressive, such as by extending the discount U-pass to low-income people or increasing the existing provincial sales tax rebate to low income households.⁵ Improving this plan to make it more progressive should be a high priority for anyone aiming transition off fossil fuels and reduce carbon pollution; social justice is essential for building public support for major societal change.⁶

The Plan also only projects a stabilization of carbon pollution from transportation in the region, rather than the deep and rapid reduction needed. However, there is considerable flexibility in the Plan to enhance both pollution reduction and job creation.

2 More Jobs and Less Pollution

Jobs are an important consideration in building support for the necessary transition off fossil fuels. Luckily, improving public transit tends to improve employment prospects – particularly in a region such as western Canada that does not have a significant auto manufacturing sector.



Quantifying the jobs that would be created by the Mayors' Plan if passed in the upcoming referendum is beyond the scope of this report. Rather, the focus of this report is on how to enhance the jobs and wellbeing from this and other transportation investments.

There is strong evidence showing that public transit and other sustainable transportation investments produce a large number of good jobs right in the communities that do the investing. This is in stark contrast to the much lower numbers of jobs – largely family disrupting fly-in-fly-out jobs – produced by spending in the petroleum sector.

The automotive sector and highway and road construction also result in relatively few jobs per dollar spent, particularly in areas such as BC that don't have an automobile manufacturing sector.

Therefore, taking steps to reduce fossil fuel consumption and carbon pollution are ways of enhancing the creation of good local jobs people can feel proud of.

⁵ "Why we're voting "yes" to new transit and transportation funding in the referendum" (May 3, 2015) www.straight.com/news/402061/why-were-voting-yes-new-transit-and-transportation-funding-referendum

⁶ E.g. Naomi Klein (2014) *This Changes Everything: Capitalism vs The Climate*.

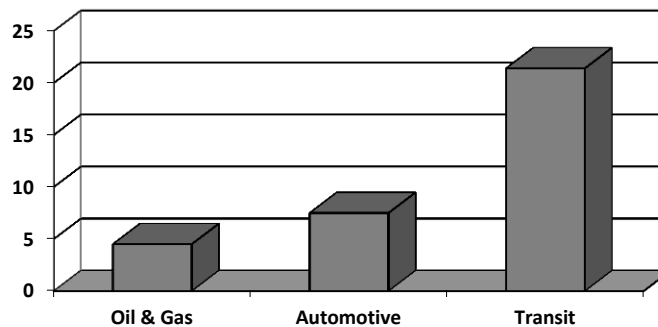
Some steps to enhance job creation and pollution reduction include:

Shift Spending to Transit from Road and Fossil Fuel Infrastructure

Numerous studies show that improving public transit is a superior job creator to new and wider roads or fossil fuel infrastructure. The same or lower overall transportation expenditure will then produce more employment.

For example, using BC Treasury Board figures, the Canadian Urban Transit Association estimates that a \$1 million transit expenditure creates 21.4 jobs in BC, compared to 7.5 jobs for the same automotive expense and only 4.5 jobs in oil and gas. That is almost three times as many jobs per dollar in transit as in the automotive sector, and over four times as many in transit as in oil and gas shown below in Figure 2-1.⁷

Figure 2-1 Jobs per Million Dollars



Source: CUTA (2003) *Transit Means Business: The Economic Case for Public Transit in Canada*

Similarly, the University of Massachusetts study *The Economic Benefits of Investing in Clean Energy* rate public transit as the top low-carbon job creator. This study's main focus is on the economics of renewable energy and energy efficiency, and it includes public transit and railway transportation as an energy efficiency measure. This study places public transit and rail transportation as the top job creator, as shown below in Figure 2-2 below (90% transit 10% freight rail). This study emphasizes that re-allocating expenditures from the fossil fuel sector to renewable energy and energy efficiency

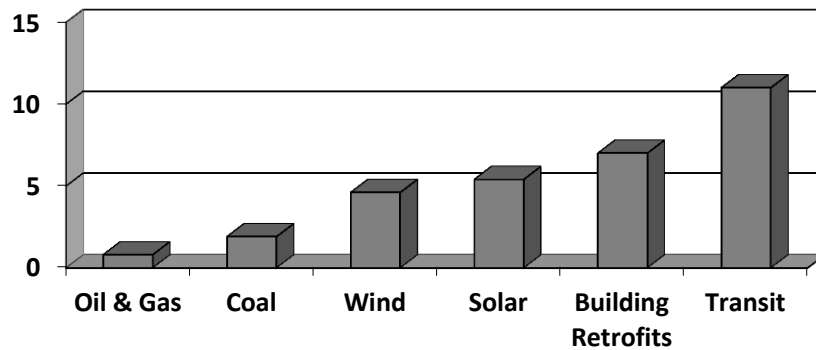
⁷ CUTA (2003) *Transit Means Business: The Economic Case for Public Transit in Canada*

http://www.cutactu.ca/en/public-transit/publicationsandresearch/resources/IssuePaperNo.5_TransitMeansBusiness_TheEconomicCaseforPublicTransitinCanada.pdf

measures such as public transit would “generate a large net expansion in employment” (p 33).⁸

It is important to recognize that it is not just the public investments in transit that have positive effects; reducing individual household expenditures on fuel and automotive expenses also creates local jobs. It is well established that improved transit and other sustainable transportation options reduces overall household spending on transportation. One million dollars of fossil fuel savings re-directed to typical consumer goods creates 4.5 jobs in the US economy; and saving one million in automotive expenses creates about 3.5 jobs.⁹ In an area such as BC with no significant automotive manufacturing and little refining capacity the local employment benefits may be even greater.

Figure 2-2
Direct Job Creation per \$ Million



Source: *Economic Benefits of Investing in Clean Energy* (Table 4)

In Metro Vancouver, people spend about nine billion dollars every year to buy and operate private automobiles, including fuel costs.¹⁰ On the individual or family level, choosing to own one less car typically results in savings of four to fifteen thousand

⁸ Robert Pollin, James Heintz, and Heidi Garrett-Peltier (2009) *The Economic Benefits of Investing in Clean Energy: How the economic stimulus program and new legislation can boost U.S. economic growth and employment*. PERI - University of Massachusetts.

www.peri.umass.edu/fileadmin/pdf/other_publication_types/green_economics/economic_benefits/economic_benefits.PDF

⁹ Harry Chmelynski (2008), National Economic Impacts per \$1 Million Household Expenditures (2006); Spreadsheet Based On IMPLAN Input-Output Model. Ctd in Todd Littman (2010) Evaluating Transportation Economic Development Impacts. http://www.vtpi.org/econ_dev.pdf

¹⁰ \$12,000 per household on transportation X 88% vehicle X 891,336 dwellings = \$9.4 Billion

www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/famil130a-eng.htm; www.tc.gc.ca/eng/policy/anre-menu-3021.htm; <http://www12.statcan.gc.ca/census-recensement/2011/dp-prof/details/page.cfm?Lang=E&Geo1=CD&Code1=5915&Geo2=PR&Code2=59&Data=Count&SearchType=Begins&SearchPR=01&B1=All>

dollars a year.¹¹ Even a small portion of this re-directed to other consumer expenditures such as restaurant meals would have a substantial positive effect on regional employment. The opportunity for people to work less with lower personal transportation expenses is also an important social and economic benefit to consider. A transportation system that forces people to work excessive hours in order to pay for automobiles and fuel to get to work is no recipe for sustainable prosperity or a healthy society.¹²

Lower mainland residents can influence provincial priorities for the better, such as by pushing for better transit and improved highway maintenance instead of the controversial multi-billion dollar freeway bridge slated to replace the Massey Tunnel.

Invest in Immediate Transit Service Improvements

Capital investments in major rapid transit projects have considerable employment advantages over fossil fuel subsidies or expanding highways and roads. However, improving transit service by investing in the operations side, such as hiring more bus drivers to increase the frequency of service and provide more late night and early morning service have even greater employment benefits.¹³

Employment enhancement is a factor that should be considered in selecting the type of rapid transit technology on each route. The Mayors' Plan includes the possibility of low capital cost bus rapid transit on routes such as Scott Road (120 St.) which is the dividing line between Surrey and Delta, and along 41st Avenue in Vancouver. When less is spent on capital, more is available to invest in operations.

Take Walking and Cycling Infrastructure Seriously

All public transit trips start with a walking (including wheelchairs and mobility scooters) or bicycle trip. And inadequate sidewalks and bicycle routes means fewer people can safely use transit.

Cycling and walking facilities are far more labour-intensive than road infrastructure. A World Health Organization study documents that road building creates the least jobs of any type

Residents can influence how Major Road Network funds are spent

¹¹ Based on costs from http://caa.ca/car_costs/

¹² E.g. UK Sustainable Development Commission (2009) *Prosperity without growth? The transition to a sustainable economy*. www.sd-commission.org.uk/publications.php?id=914

¹³ Transportation Equity Network (no date – 2010?) *More Transit = More Jobs* www.equitycaucus.org/Library/MoreTransitMoreJobs

of public infrastructure spending, and cites French data shows cycling producing four times as many jobs per million Euros as the car industry.¹⁴ The Mayors' Plan includes plans for enhanced sidewalks and pedestrian safety near transit routes, as well as protected bicycle lanes. In addition, using part of the \$200 million allocated in the Plan to Major Road Network capital to improve facilities near major roads would have employment, health and environmental benefits. This choice is largely up to the municipalities where TransLink's 'Major Roads' are located, so residents can influence these decisions in their own communities.

Shift to Renewable Electricity

Spending on fossil fuels, such as diesel fuel, has among the worst jobs return of any sector in our economy. In contrast, renewable electricity is one of the better ways of creating jobs as shown in figure 2-2 above. And those jobs would mainly be here in BC, which has very good low impact renewable electricity potential. Of course, it is important to do renewable energy projects right with stringent protections for fish and wildlife habitat and the involvement of indigenous communities in decision making.



The Mayors Plan includes electric powered rapid transit projects in Surrey / Langley and Vancouver. And our region already has one of the largest fleets of electric trolley buses in North America. Many more of our bus lines, including B-line express buses could be converted to trolley bus. In addition, trolley buses that run off wire on batteries for reasonable distances are now available; and trolley – diesel hybrids have been available for decades.¹⁵ Electric battery only buses for less busy routes on flat terrain are also becoming a practical option as battery technology improves.

Make Transit Vehicles Last

Most new buses and transit vehicles purchased for use in BC are manufactured outside of BC. However, even complete rebuilds of buses and rail vehicle can be done here in Metro Vancouver. For example, TransLink has been re-furbishing older SkyTrain cars in Burnaby rather than buying more new cars manufactured in Mexico or Ontario.

The TransLink bus fleet could be rapidly expanded by hiring mechanics and other trades people to refurbish older buses to last up to a decade longer. In contrast, it can

¹⁴World Health Organization (2014) *Unlocking new opportunities: Jobs in green and healthy transport* www.euro.who.int/en/publications/abstracts/unlocking-new-opportunities-jobs-in-green-and-healthy-transport

¹⁵ For more information on the potential of trolley buses see Eric Doherty (2013) "Humble trolley bus reborn as climate superhero" www.vancouverobserver.com/politics/commentary/humble-trolley-bus-reborn-climate-superhero

take years to order new buses – a waiting time that could get much longer if many cities respond to the climate crisis by rapidly expanding public transit. The loss of forestry jobs due to the climate fueled Pine Beetle epidemic includes heavy duty mechanics who could be quickly re-trained to work on transit vehicles.

Make our Roads and Bridges Last

Building new bridges and roads is a huge expense, and much of the expenditure often leaves the province or country to pay for imported materials and services from multinational corporations.



Lions Gate Bridge Deck Replacement

In contrast, good maintenance and refurbishment of existing infrastructure produces more jobs, and those jobs are more likely to go to people who live in the region. Repair and refurbishment work on roads and bridges creates about 15 percent more jobs per dollar than new highways.¹⁶ The Mayors' Plan includes a new four-lane bridge to replace the existing four-lane Pattullo Bridge but if the referendum fails this could be reconsidered. The existing Pattullo Bridge could likely be upgraded with a new deck and

earthquake strengthening for about a third of the cost of a new bridge.¹⁷

Buy Canadian Buy Local

Our neighbours in the US routinely require that public transit vehicles and materials be produced in country – and sometimes in the same state.

If we are looking forward to the economy of the future, rather than the polluting fossil fuel industries of the past, supporting the Canadian public transit industry is essential. As the Green Economy Network Canada puts it:

“We need strong domestic content rules, as used by other countries (including our “free trade” partners) to ensure that our green transport initiatives create good jobs – that will also help generate the tax revenues to pay for these essential investments. We need industry policies that allow all segments of our communities to benefit.”¹⁸

¹⁶ Sierra Club USA (no date) *Fix It First!* www.sierraclub.org/transportation/fixitfirst/background.aspx

¹⁷ City of New Westminster (2014) *A Reasonable Approach: A Perspective on the Pattullo Bridge* (P5) www.newwestcity.ca/council_minutes/0317_14_CW/9.%20EN%20Pattullo%20Bridge%20-%20CNW%20Position.pdf

¹⁸ Green Economy Network Canada (2014) *Transport Fact Sheet* http://greeneconomynet.ca/wp-content/uploads/sites/43/2014/11/GEN-1-Transit-and-Rail_August-2014_ENG_1.pdf

3 Conclusion

Younger people have shown that they are not very interested in jobs in the fossil fuel sector, in part because of ethical considerations about climate pollution.¹⁹ Everyone wants to be able to make a living doing something they feel good about, and governments have the opportunity to create many more good jobs people can feel proud of by making the right decisions about transportation infrastructure.

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Regardless of the outcome of the transit referendum vote, much more will have to be done to reduce oil consumption and greenhouse gas pollution in the transportation sector here in BC and around the planet.

The biggest threat to livelihoods in B.C. now is the carbon pollution from burning fossil fuels. If we want fisheries and forestry, it is now essential to rapidly transition off fossil fuels.

Lower mainland residents can influence provincial priorities for the better, such as by pushing for better transit and improved highway maintenance instead of the controversial multi-billion dollar freeway bridge slated to replace the Massey Tunnel. We can also influence municipalities' priorities and ensure Major Road Network capital is invested in improving transit, walking and cycling conditions; rather than spending these funds on road widening which increases pollution and makes roads more dangerous for people walking.

Reducing our dependence on tar sands oil in Metro Vancouver is a significant local action we can take toward stabilizing the climate and ocean chemistry globally and creating good jobs locally.

As one of the most fashionable urban regions in the world and the "Gateway to the Pacific," we have the opportunity to frame a dialogue with the world's biggest carbon emitters in China, India and the US about how we can work together for climate solutions. Our positive actions can show how good jobs can be the result of making the right transportation choices.

¹⁹ E.g. Geoff Dembicki (March 23, 2015) *The Tyee* "Why Are Young Workers Shunning the Oilsands? Millennials more likely to view industry as outdated and polluting." <http://thetyee.ca/News/2015/03/23/Young-Workers-Shunning-Oilsands/>

Appendix - Research on Job Creation Potential of Public Transit and other Low-Carbon Transport

There are many reports showing that public transit and other sustainable transportation investments produce a large number of good jobs right in the communities that do the investing. This is in stark contrast to the very low numbers of jobs – largely family disrupting fly-in-fly-out jobs – produced by spending in the petroleum sector. The automotive sector and constructing new roads and highways also results in relatively few jobs per dollar spent, particularly in areas such as BC that don't have an automobile manufacturing sector.

Estimates vary, but the evidence is very strong that good public transit translates into good local jobs and multiple benefits:

A 2014 study from the World Health Organization, *Unlocking new opportunities: Jobs in green and healthy transport*, documents that investments in healthy transportation including public transit, cycling and walking are far more labour-intensive than road infrastructure. The study asserts that road building creates the least jobs of any type of public infrastructure spending, and that French data shows cycling producing four times as many jobs per million Euros as the car industry.²⁰

One of the best documented studies, with extensive discussion of the methodologies used, is the 2009 University of Massachusetts study *The Economic Benefits of Investing in Clean Energy*. This study's main focus is on the economics of renewable energy and energy efficiency, and it includes public transit and railway transportation as an energy efficiency measure. This study places public transit and rail transportation as the top job creator (90% transit 10% freight rail). This study emphasizes that re-allocating expenditures from the fossil fuel sector to renewable energy and energy efficiency measures such as public transit would "generate a large net expansion in employment" (p 33).²¹

In the 2011 report *Transportation Funding and Job Creation*, Smart Growth USA found that one set of public transportation projects produced 70% more jobs per dollar than road projects. This report also points out that repair of existing road infrastructure produces considerably more jobs per dollar invested than new roadway construction.²²

²⁰ www.euro.who.int/en/publications/abstracts/unlocking-new-opportunities-jobs-in-green-and-healthy-transport

²¹ *The Economic Benefits of Investing in Clean Energy: How the economic stimulus program and new legislation can boost U.S. economic growth and employment*. Robert Pollin, James Heintz, and Heidi Garrett-Peltier (2009) PERI - University of Massachusetts.
www.peri.umass.edu/fileadmin/pdf/other_publication_types/green_economics/economic_benefits/economic_benefits.PDF

²² *Recent Lessons from the Stimulus: Transportation Funding and Job Creation*.

www.smartgrowthamerica.org/2011/02/04/new-report-reveals-smart-transportation-spending-creates-jobs-grows-the-economy/

The US-based Transportation Equity Network (TEN) report *More Transit = More Jobs* looks at what would happen if about half of the US urban freeway budget was invested in public transit. Their answer is many more jobs for the same money. TEN emphasizes that public transit investment creates more jobs per dollar than urban freeways and other roads. But they also propose focusing more on immediate improvements to transit service and less on large capital investments such as subway construction as a way of enhancing job creation: “Transit operations generate more jobs per dollar spent than transit capital spending because transit operations are more labor-intensive and do not involve significant non-labor inputs, such as land acquisition or materials.”²³

In *Transit Means Business: The Economic Case for Public Transit in Canada* (2003) the Canadian Urban Transit Association cites a BC Treasury Board estimate that a \$1 million transit expenditure creates 21.4 new jobs in BC, compared to 7.5 jobs for the same automotive expense and only 4.5 jobs in oil and gas. That is almost three times as many jobs per dollar in transit as in the automotive sector, and over four times as many in transit as in oil and gas.²⁴

In the 2009 report *Building a Green Economic Stimulus Package for Canada* Sustainable Prosperity Canada ranked investments in public transit as the #1 green economic stimulus option. Their economic criteria include domestic investment, job creation and avoiding the damage costs of carbon pollution. The reports states that “Environmental harm imposes very real costs on our society and economy. Long term estimates of the cost of climate change are that it could cut between 5 and 20% of the world’s wealth by the end of the century – more than the cost of both world wars and the depression combined” (p 8). Freeway and bridge expansions are ranked #21 - third from last.²⁵

The Sierra Club USA is one of many groups supporting Fix it First policies – policies to prioritize maintenance and repair of existing roads and bridges above new or expanded roads and highways. One of the main points they emphasize is that roads in good repair reduce damage costs and crash risk for individuals and businesses. Job creation is also an important part of the message: “Repair work on roads and bridges creates 16 percent more jobs than new highways, while investing in public transit creates 31 percent more jobs than building new highways”²⁶

²³ (no date – 2010?) www.equitycaucus.org/Library/MoreTransitMoreJobs

²⁴ http://www.cutaactu.ca/en/public-transit/publicationsandresearch/resources/IssuePaperNo.5_TransitMeansBusiness_TheEconomicCaseforPublicTransitinCanada.pdf

²⁵ www.sustainableprosperity.ca/article20

²⁶ Fix It First! (no date) www.sierraclub.org/transportation/fixitfirst/background.aspx