



Carbon Neutral Action Report | 2015

Executive Summary

BC Transit is an essential component of British Columbia's integrated transportation network. Many British Columbians rely on BC Transit to commute to work or school, to access services and leisure opportunities, and to connect with friends and family.

Transit contributes to prosperous communities and a strong provincial economy by:

- Providing a transportation alternative that connects people to jobs, education, health care and recreation;
- Making transportation more affordable for families and individuals;
- Reducing congestion, allowing for the efficient movement of people and goods; and
- Supporting efficient land use and compact communities contributing to reductions in greenhouse gas emissions and other pollutants.

In support of overall emission reduction targets, BC Transit has reduced its defined emissions regulated for offset by 25% from 2009 and by 22% from 2010 when offset payments were first required. Looking ahead, BC Transit is on track to meet provincial reduction targets, although further cost-effective reductions of regulated emissions beyond 2015 to meet the 2020 target of 33% reduction will be challenging.

To achieve these challenging goals, BC Transit continues to work with its partners to ensure vehicles are matched to changing passenger demand. For example, where routes allow for a smaller ``medium duty`` bus to deliver the service, savings of up to 30% less Green House Gases (GHG) can be achieved versus a larger 12-metre conventional bus. To support this initiative, BC Transit recently issued a Request for Proposal for 41 medium duty buses, with a total of up to 112 being required over the next five years to support planned fleet replacement.

Two additional areas where BC Transit has taken an important role to support the Province's Climate Leadership Plan is by identifying opportunities to further deploy Compressed Natural Gas (CNG) buses in communities throughout the province and implement other green initiatives to reduce GHG emissions.

A key component of this effort is a coordinated approach to identifying, testing and integrating new fleet technologies. During 2015 BC Transit worked closely with the Canadian Urban Transit Association, fellow transit agencies along with industry and academic institutions to advance a coordinated research and innovation agenda for the sector. This has led to the establishment of the

Canadian Urban Transit Research and Innovation Consortium (CUTRIC). CUTRIC's objective is to support industry-academic collaborations in the development of the next generation of energy efficient and low carbon technologies for Canadian transit systems. BC Transit intends to take a leadership role in CUTRIC in 2016.

During the year, BC Transit also worked with Carbon Engineering Ltd. & the District of Squamish to assess the viability and help establish the business case for using atmospheric CO₂ to produce low carbon synthetic diesel. It is expected that construction of a pilot scale plant for the production of synthetic fuel will commence in 2016.

While BC Transit remains committed to exploring new technologies to lower its GHG footprint, it is important to recognize that the greatest gains in reducing transportation GHGs remains in a fundamental shift of mode share from personal vehicles to public transit.

A handwritten signature in black ink, appearing to read 'BA', with a stylized flourish extending from the end.

Brian Anderson

Vice President,
Operations & Chief Operating Officer
BC Transit

DECLARATION STATEMENT

This is the 2015 Carbon Neutral Action Report for BC Transit. This report contains our 2015 emissions profile, offsets purchased, the actions we have taken in 2015 to reduce our GHG emissions and our plans to continue reducing emissions in 2016 and beyond.

EMISSIONS AND OFFSETS SUMMARY

Most greenhouse gases produced from BC Transit's operations comes from the combustion of fossil fuels in our vehicle fleet and the energy used to heat and cool the buildings we own or lease.

BC Transit GHG Emissions and Offsets for 2015 (TCO₂E)

GHG Emissions created in Calendar Year 2015 (from SMARTTool Homepage)

Total Emissions (TCO ₂ E)	64,582
Total Offsets (TCO ₂ E)	1,148

Adjustments to GHG Emissions Reported in Prior Years (from SMARTTool Homepage)

Total Emissions (TCO ₂ E)	0
Total Offsets (TCO ₂ E)	0

Total Emissions for Offset for the 2015 Reporting Year (from SMARTTool Homepage)

Total Offsets (TCO ₂ E)	1,148
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Brian Anderson

Vice President and Chief Operating Officer

BC Transit

May 29, 2016

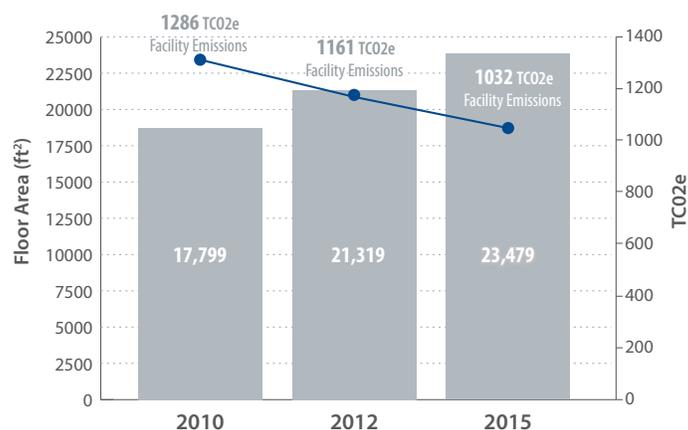
2015 Greenhouse Gas Emissions

FROM THE GHG EMISSIONS SOURCE DETAIL REPORT

Emission Source		Greenhouse Gases in Tonnes
Mobile Fuel Combustion (Fleet and other mobile equipment)		
Offset Required	Fuel Combustion	103.43
	Offset Required Sub Total	103.43
Offset Exempt	Public Transit	61,236.12
	CO2 from Biogenic Fuel Combustion	2,171.22
	Offset Exempt Sub Total	63,434.33
	TOTAL MOBILE EMISSIONS	63,538
Stationary Fuel Combustion (Building Heating and Generators) and Electricity		
Offset Required	Fuel Combustion **	974.95
	Purchased Energy	56.67
	Offset Required Sub Total	1,031.62
Offset Exempt	CO2 from Biogenic Fuel Combustion	0.29
	Offset Exempt Sub Total	0.29
	TOTAL STATIONARY EMISSIONS	1,032
Supplies (Paper)		
Offset Required	Non-recycled Content Paper	0.05
	Recycled Content Copy Paper	12.59
	Offset Required Sub Total	12.64
	TOTAL SUPPLIES EMISSIONS	13
TOTALS		
	Total Offset Exempt	63,435
	Total Offset Required	1,148
	TOTAL EMISSIONS	64,582

It was estimated that fugitive emissions from vehicle fleet air conditioning do not comprise more than one per cent of BC Transit's total emissions and an ongoing effort to collect or estimate emissions from this source would not be materially effective. For this reason emissions from this source have been deemed out of scope and have not been included in BC Transit's total greenhouse gas emissions profile.

**Graphic – facility emissions reductions from 2010
Carbon Intensity vs. Building Areas**



Offsets Applied to Become Carbon Neutral in 2015

BC Transit measures and is accountable for its environmental results. BC Transit measures and reports its greenhouse gas emissions under carbon accounting protocols consistent with the Carbon Neutral Government Regulation using the web-based application known as SMARTTool, and offsets those regulated greenhouse gas emissions it cannot avoid through payments to the Minister of Finance.

In 2015 BC Transit offset 1,148 tonnes of regulated emissions.

As required by section 5 of the Carbon Neutral Government Regulation, 63,435 tonnes of CO₂e of emissions resulting from the operation of transit buses was reported as part of our greenhouse gas emissions profile in 2015. However, they were not offset as they are out of scope under section 4 (2) (c) of the Carbon Neutral Government Regulation.



CNG Fueling station with CNG buses in Nanaimo

Emission Reduction Activities

A. MOBILE FUEL COMBUSTION

Greenhouse gas (GHG) emissions per service hour (a Key Performance Indicator) were 28.39 kg CO₂e per service hour in 2015. Service hour emissions have declined from the 28.8 kg CO₂e/hour in 2010.

In May and June 2015, BC Transit, with support from FortisBC's Natural Gas for Transportation Incentive Program and the City of Kamloops, introduced natural gas fuelling and 25 CNG buses in regular service at Kamloops Regional Transit. Compared to diesel the primary benefits of CNG buses are lower and more stable fuel prices. Additional benefits include quieter engines and simplified emission systems.

In partnership with the Regional District of Nanaimo, and again with additional support from FortisBC under the Natural Gas for Transportation Incentive Program, BC Transit began planning construction of a CNG fuelling station expansion at the Nanaimo Transit Centre ready to support an additional 25 bus CNG fleet which will be delivered in fall 2016 when Nanaimo will become almost entirely a CNG technology fleet.

Fleet expansion and replacement of older, more polluting diesel buses continued in 2015, BC Transit purchased 40 heavy duty diesel buses that use the 2014 EPA emissions control standards. These buses were used to replace 1995 and 96 vehicle models.

EPA Percent Change in Emissions from 1980

	1980 vs 2014	1990 vs 2014	2000 vs 2014
Carbon Monoxide (CO)	-69	-62	-46
Lead (Pb)	-99	-80	-50
Nitrogen Oxides (NOx)	-55	-51	-45
Volatile Organic Compounds (VOC)	-53	-38	-16
Direct PM10	-58	-19	-16
Direct PM2.5	---	-25	-33
Sulfur Dioxide (SO ₂)	-81	-79	-70

Notes:

1. --- Trend data not available
2. Direct PM10 emissions for 1980 are based on data since 1985
3. Negative numbers indicate reductions in emissions
4. Percent change in emissions based on thousand tons units

Non-revenue fleet

Building from Plug-in BC, BC Transit is investigating options for procurement within the Non-Revenue Vehicle Replacement Project. This includes Transit Supervisor vehicles and administration pool cars.

BC Scrap-it Program: BC Transit's Victoria Regional Transit System offers a monthly pass incentive for vehicle owners to scrap their older, more polluting vehicles and adopt transit; implementation of this program removed 329.39 tonnes of GHGs that would otherwise have been emitted in 2015.

Nissan Leaf – BC Transit's first all-battery electric pool car



BC Transit's non-revenue fleet, a Nissan Leaf-battery electric car travelled more than 3,700 kms in 2015 avoiding more than 592 kg GHG compared to an incumbent hybrid vehicle.

B. STATIONARY FUEL COMBUSTION - FACILITIES

Facilities GHG emissions declined by 3.6% in 2015. This is despite the addition of the Kamloops CNG compression station to our fixed asset portfolio. This reduction was primarily a result of continued efficiency improvements at the Victoria Regional Transit facilities, notably lighting upgrades at Victoria HandyDART Centre, Commerce Circle Transit Centre as well energy efficiencies in other Regional Transit Systems, for example lighting upgrades at the Central Fraser Valley Transit Centre.

Kamloops Facility CNG Opening



Actions Planned for 2015

- BC Transit will implement an expanded CNG bus fleet and increased fueling infrastructure in the Nanaimo Transit System in 2016.
- BC Transit will continue to seek opportunities to deploy additional CNG buses in communities throughout the province as we prepare to replace half of BC Transit's fleet (about 400 buses) over the next five years.
- More than 45 heavy and light duty buses will be delivered in 2016, replacing older more polluting and less energy efficient diesel buses. A procurement strategy for medium duty buses will also be implemented, providing further opportunities to right-size vehicles by service application and increase the cost effectiveness and efficiency of transit.
- BC Transit will partner with local communities to build transit infrastructure to provide more energy efficient operations and improved transit services. Energy efficiency efforts to be taken in the Victoria Regional Transit System include more lighting upgrades to Direct Digital Control (DDC) systems, Heating, Ventilation & Air Conditioning (HVAC) upgrades at Victoria Transit Centre and a new roof with better insulating properties at the Langford Transit Centre.
- BC Transit will work with local governments to extend the Douglas Street Priority Transit and Cycling Lanes in Victoria. The priority lanes are designed to shorten travel times for transit customers, increase the reliability of public transit and reduce harmful greenhouse gas emissions by limiting idling and reducing the number of vehicles on the road.
- The replacement of the wastewater treatment system at Victoria Regional Transit Centre facility will allow for better water treatment and may lead to options to further conserve water use and thus reduce associated energy demands.
- BC Transit will be planning and designing a seismic upgrade at the Victoria Transit Centre and associated reallocation of maintenance duties to the Langford Transit Centre. Through this re-design, efforts will be made to increase energy efficiency at both the Victoria and Langford Transit Centres.
- The BC Transit Green Team will focus on participating in regional green initiatives like Bike to Work Week, Help Fill a Dream Garden Planting Day and Shoreline Clean-up.

- BC Transit will develop a Climate Resiliency and Adaptation Action Plan.
- BC Transit intends to take a leadership role in the development and progress of the CUTRIC taskforce by appointing a member of its senior leadership team to the Board
- BC Transit will continue to explore opportunities for use of synthetic fuel at Squamish Transit with Carbon Engineering.
- BC Transit will work to align with Provincial initiatives to progress Climate Leadership in BC following COP 21.

Links to Other BC Transit Information Relevant to Sustainability

Government Mandate Letter – 2015 / 2016

<http://bctransit.com/servlet/documents/1403642453986>

BC Transit Service Plan 2014 – 2017

<http://bctransit.com/servlet/documents/1403640520031>

BC Transit 2013 – 14 Annual Report

<http://bctransit.com/servlet/documents/1403643424968>

BC Transit Sustainability

http://bctransit.com/*/about/sustainability

BC Transit Future Plans

http://bctransit.com/*/corporate-reports/strategic-plan-2030

BC Transit is a member of the Community Energy Association

<http://communityenergy.bc.ca/>

BC Transit Victoria Regional Transit System is member of BC Scrap It Program

<http://www.scrapit.ca/incentivechoices.htm>

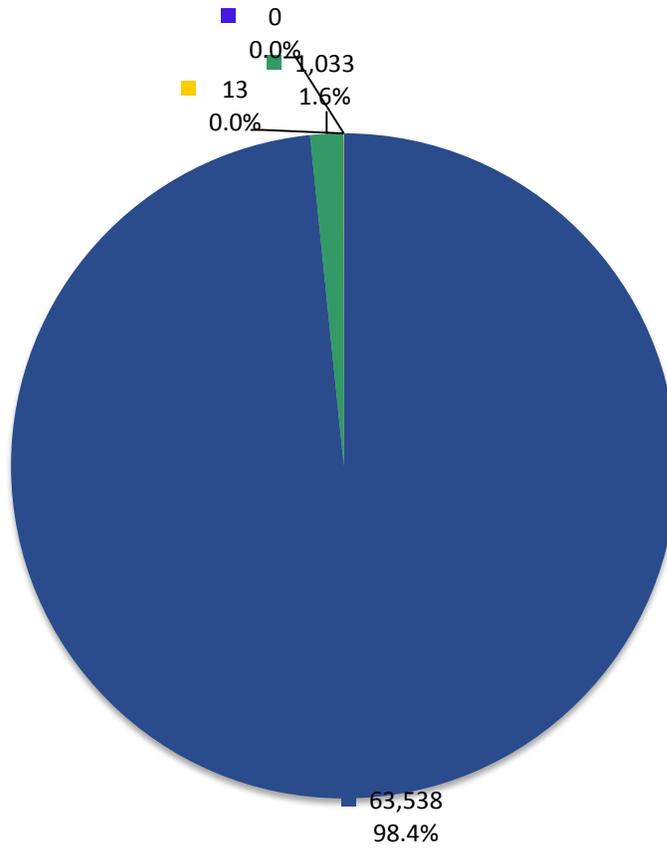
Canadian Urban Transit Research & Innovation Consortium (CUTRIC)

<http://cutric-crituc.org/>



520 Gorge Road East, Victoria, BC V8W 9T5
www.bctransit.com

**BC Transit
Greenhouse Gas Emissions by Source
for the 2015 Calendar Year (tCO₂e*)**



Total Emissions: 64,583

- Mobile Fuel Combustion (Fleet and other mobile equipment)
- Stationary Fuel Combustion (Building Heating and Generators) and Electricity
- Supplies (Paper)
- Fugitive Sources

Offsets Applied to Become Carbon Neutral in 2015 (Generated May 24, 2016 4:41 PM)

Total offsets required: **1,148**. Total offset investment: **\$28,700**. Emissions which do not require offsets: **63,435** **

*Tonnes of carbon dioxide equivalent (tCO₂e) is a standard unit of measure in which all types of greenhouse gases are expressed based on their global warming potential relative to carbon dioxide.

** Under the *Carbon Neutral Government Regulation of the Greenhouse Gas Reduction Targets Act*, all emissions from the sources listed above must be reported. As outlined in the regulation, some emissions do not require offsets.

2015 Carbon Neutral Action Report Survey

Organization Name:

BC Transit

Please select your sector:

- Crown Corporation

1) Stationary Sources (Buildings, Power Generators, Ext. Lighting) Fuel Combustion, Electricity use, Fugitive Emissions:

Please indicate which actions your PSO took in 2015:

Have developed an overall strategy/plan to reduce energy use in your organization's buildings inventory:

No

If Yes, please describe:

(No response)

Undertook evaluations of building energy use:

Yes

Performed energy retrofits on existing buildings:

Yes

Built or are building new LEED Gold or other "Green" buildings:

No

Please list any other actions, programs or initiatives that your organization has introduced that support emissions reductions from buildings:

- *BC Transit carried out lighting upgrades at Victoria HandyDART, Abbotsford (CFV), and Commerce Circle Transit Centres and increased maintenance frequency in order to improve performance and reduce energy costs.*
- *A water consumption audit was conducted at the Victoria Transit Center facility in cooperation with the Capital Regional District. Findings from the audit may allow for reduced use of water as well as waste water treatment with correspondingly reduced energy demands.*

2) Mobile Sources (Fleet, Off-road/Portable Equipment) Fuel Combustion:

Indicate which actions your PSO took in 2015:

Have put in place an operations policy/program to support systematic reductions in fleet related emissions:

(e.g., program to convert fleet to renewable fuels)

Yes

If Yes, please describe:

In 2015, BC Transit, with support from FortisBC's Natural Gas for Transportation Incentive Program and the City of Kamloops, introduced fuelling of 25 Compressed Natural Gas (CNG) buses in regular service at Kamloops Transit Centre. Compared to diesel, the primary benefits of CNG buses are lower and more stable fuel prices. Additional benefits include quieter engines and simplified emission systems.
Also in 2015, BC Transit purchased 40 heavy duty diesel buses that use the 2014 EPA emissions control standards. These buses were used to replace 1995 and 96 vehicle models.

Replaced existing vehicles with more fuel efficient vehicles (gas/diesel):

Yes

Replaced existing vehicles with hybrid or electric vehicles:

No

Took steps to drive less than previous years:

No

Please list any other actions, programs or initiatives that your organization has introduced that support emissions reductions from fleet combustion:

All BC Transit employees have bus passes. Pool cars (hybrids and electrical) are available when meeting logistics prevents transit use. The BC Transit non-revenue fleet vehicle – a Nissan Leaf—battery electric car has traveled more than 3700 kms in 2015 avoiding more than 592 kg GHG compared to an incumbent hybrid vehicle.

3) Supplies (Paper):

Indicate which actions your PSO took in 2015:

Have put in place an operations policy/program to facilitate a systematic reduction in paper-related emissions:

(e.g., policy to purchase 100% Recycled Content; default to double-sided printing)

Yes

If yes, please describe:

Staff have been educated on how to default to double sided printing.

Have put in place an operations policy/program to facilitate behavioural changes from paper use:

(e.g. awareness campaign to reduce paper use):

No

If yes, please describe:

(No response)

Used only 100% recycled paper:

No

Used some recycled paper:

Yes

Used alternate source paper:

(e.g., bamboo, hemp, wheat etc.)

No

Please list any other actions, programs or initiatives that your organization has introduced that support emissions reductions from paper supplies:

*Over 99% of all paper purchased under reporting guidelines is between 30 to 40% recycled content. We continued to review opportunities to further increase our post-consumer content in purchased paper.
Double-sided printing is encouraged whenever possible.*

4) Other Sustainability Actions:

Please note that this section is optional

Business Travel

Created a low-carbon travel policy or travel reduction goal:

(low-carbon = lowest emission of greenhouse gas per kilometer per passenger)

No

Encouraged alternative travel for business:

(e.g. bicycles, public transit, walking)

Yes

Encouraged or allow telework/working from home:

Yes

Other:

(No response)

Education Awareness

Have a Green/Sustainability/Climate Action Team:

Yes

Supported green professional development:

(e.g. workshops, conferences, training)

Yes

Supported or provided education to staff about the science of climate change, conservation of water, energy and/or raw materials:

Yes

Other:

(No response)

Adaptation Planning for Climate Risks

Have assessed whether increased frequency of extreme weather events and/or long term changes in climate will affect your organization's infrastructure, its employees and/or its clients:

No

Have incorporated these anticipated changes in climate into your organization's planning and decision making:

No

Other:

(No response)

Other Sustainability Actions

Established a water conservation strategy which includes a plan or policy for replacing water fixtures with efficient models:

Yes

Have put in place an operations policy/program to facilitate the reduction and diversion of building occupant waste stream from landfills or incineration facilities:

(e.g., composting, collection of plastics, batteries)

Yes

Established green standards for goods that are replaced infrequently and/or may require capital funds to purchase:

(e.g., office furniture, carpeting, etc.)

Yes

Incorporated lifecycle costing into new construction or renovations:

Yes

Please list any other sustainability actions your organization has taken not listed above:

BC Transit is a member of the U-Pass and BC Bus Pass programs, which annually help to provide discounted transit passes for over 200,000 students attending the public post-secondary institutions and over 90,000 low-income seniors and people with disabilities across the province.

Fully accessible handyDART provides service to over 2 million passengers each year.