



# Carbon Neutral Action Report | 2017

# Executive Summary

Taking a bus is a more energy-efficient mode of transportation than using a single occupancy vehicle. Policies and programs to support efficient public transit systems and infrastructure will help to shift people away from using private vehicles, achieve emissions reductions and promote wider mobility options for all.

In 2017, BC Transit continued to work with the provincial government, local governments and its operating partners to implement integrated transportation networks with the goal to reduce dependence on automobiles. Collaborative planning with over 25 communities in 2017 ensured that transit networks responded to individual community and regional needs. To aid integrated mobility solutions, BC Transit worked to incorporate Smart Bus technology, starting in 2018. Smart Bus technology, including real-time bus location services (NextRide), will allow passengers to see when their next bus should be arriving. It will also allow BC Transit and operating partners to better direct buses for schedule reliability and push out alerts to customers. This technology will be rolled out to seven communities in 2018 including the Regional District of Nanaimo (RDN), the Resort Municipality of Whistler (RMOW), Kamloops and Victoria.

BC Transit's first fleet of medium duty Vicinity buses was introduced into service in communities across the province in 2013. This 27.5 foot bus allows BC Transit to right-size the fleet in communities that will benefit from a smaller, more energy efficient and cost-effective bus compared to a traditional 40 foot model. This is part of the reason that BC Transit's diesel fuel consumption drop in 2017 by almost 1 million liters while service hours increased by over 32,000 hours.

Compressed Natural Gas (CNG) bus fleet expansion has contributed to this significant decrease in diesel fuel consumption. BC Transit expanded its CNG fleet by one bus in both Nanaimo and Kamloops. The heavy duty fleets at both locations are now wholly CNG operating. These CNG buses are quieter, produce fewer emissions and will reduce reliance on volatile diesel markets.

BC Transit remains committed to testing fleet alternatives that will meet service requirements while reducing its environmental footprint. In support of this commitment, BC Transit is exploring battery electric buses using a two-phased approach. The first phase is to build partnerships with various transit bus manufacturers to trial their battery electric buses within the Victoria Regional Transit System with the goal of learning about the current state of this technology and the operational implications to daily transit system operations. The second phase is to participate in electric bus trials led by the Canadian Urban Transit Research & Innovation Consortium (CUTRIC) in partnership with select Canadian transit agencies, manufacturers, and academic institutions. The goal of participating in the CUTRIC-led trials is to build on synergies that result from collaborating with various industry partners, and to standardize charging methodologies across various bus and charging station manufacturers.

To support service expansion across the province, BC Transit has partnered with the federal and provincial governments through the Public Transit Infrastructure Fund to build three new transit facilities in Campbell River, Central Fraser Valley and Cowichan Valley. These facilities will be built to accommodate fleet expansion and will be built to current building code practices with reduced energy consumption per area (compared to incumbent transit centres).

BC Transit is excited to work with its government, operating and business partners to further encourage ridership growth, increase revenue and control costs, all while achieving a high level of customer service in pursuit of connecting people and communities to a more sustainable future.



*Brian Anderson*

Vice President,  
Operations & Chief Operating Officer  
BC Transit

## DECLARATION STATEMENT

This is the 2017 Carbon Neutral Action Report for BC Transit. This report contains BC Transit's 2017 emissions profile, offsets purchased, the actions BC Transit has taken in 2017 to reduce greenhouse gas (GHG) emissions and BC Transit's plans to continue reducing emissions in 2018 and beyond.

## EMISSIONS AND OFFSETS SUMMARY

Most greenhouse gases produced from BC Transit's operations come from the combustion of fossil fuels in the vehicle fleet and the energy used to heat and cool BC Transit-owned or leased buildings.

### BC Transit GHG Emissions and Offsets for 2017 (TCO2E)

#### GHG Emissions created in Calendar Year 2018 (from SMARTTool Homepage)

Total Emissions (TCO2E)	64,323
Total Offsets (TCO2E)	1,219

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

Total Emissions (TCO2E)	12
Total Offsets (TCO2E)	12

#### Total Emissions for Offset for the 2017 Reporting Year (from SMARTTool Homepage)

Total Offsets (TCO2E)	1,231
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May 31, 2018

# 2016 Greenhouse Gas Emissions

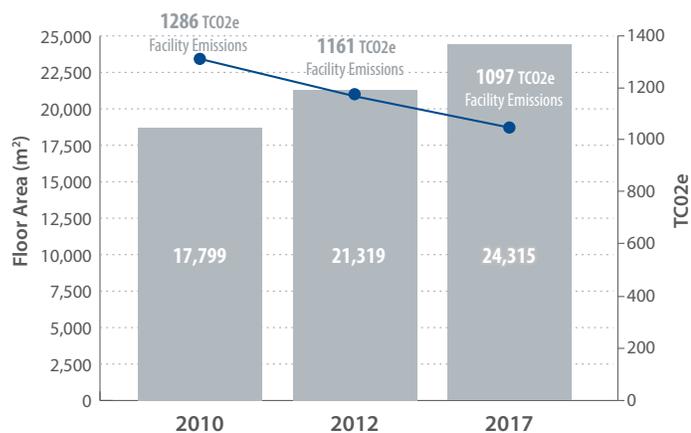
## FROM THE GHG EMISSIONS SOURCE DETAIL REPORT

Emission Source		Greenhouse Gases in Tonnes
<b>Mobile Fuel Combustion (Fleet and other mobile equipment)</b>		
Offset Required	Fuel Combustion **	109.94
	<b>Offset Required Sub Total</b>	<b>109.94</b>
Offset Exempt	Public Transit	61,065.85
	CO2 from Biogenic Fuel Combustion	2,038.26
	<b>Offset Exempt Sub Total</b>	<b>63,104.11</b>
	<b>TOTAL MOBILE EMISSIONS</b>	<b>63,214</b>
<b>Stationary Fuel Combustion (Building Heating and Generators) and Electricity</b>		
Offset Required	Fuel Combustion **	1028.62
	Purchased Energy	68.31
	<b>Offset Required Sub Total</b>	<b>1,096.92</b>
Offset Exempt	CO2 from Biogenic Fuel Combustion	0.27
	<b>Offset Exempt Sub Total</b>	<b>0.27</b>
	<b>TOTAL STATIONARY EMISSIONS</b>	<b>1,097</b>
<b>Supplies (Paper)</b>		
Offset Required	Non-recycled Content Paper	0.76
	Recycled Content Copy Paper	10.94
	<b>Offset Required Sub Total</b>	<b>11.71</b>
	<b>TOTAL SUPPLIES EMISSIONS</b>	<b>12</b>
<b>TOTALS</b>		
	<b>Total Offset Exempt</b>	<b>63,104</b>
	<b>Total Offset Required</b>	<b>1,219</b>
	<b>TOTAL EMISSIONS</b>	<b>64,323</b>

\*\* Includes Fossil Fuels and CH4 and N2O from Biogenic Fuels

Fugitive emissions from vehicle fleet air conditioning are estimated to not comprise more than 1% of BC Transit's total emissions. 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.

Facility emissions reductions from 2010  
Carbon Intensity vs. Building Areas



# Offsets Applied to Become Carbon Neutral in 2017

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. BC Transit offsets those regulated greenhouse gas emissions it cannot avoid through payments to the Minister of Finance.

In 2017, BC Transit offset 1,231 tonnes of regulated emissions. This includes 12 tonnes that were miscalculated from the 2016 reporting year.

As required by section 5 of the Carbon Neutral Government Regulation, 63,104 tonnes of CO<sub>2</sub>e resulting from the operation of transit buses were reported in as part of BC Transit's GHG emissions profile in 2017. However, they were not offset as they are out of scope under section 4 (2) (c) of the Carbon Neutral Government Regulation.

## Emission Reduction Activities

### A. MOBILE FUEL COMBUSTION

Greenhouse gas (GHG) emissions per service hour (a Key Performance Indicator) were 28.85kg CO<sub>2</sub>e per service hour in the 2016/17 fiscal year. Service hour emissions have shown modest declines since 2010, even with significant service hour increases.

In 2017, BC Transit, with support from Fortis BC's Natural Gas for Transportation Incentive Program and the Resort Municipality of Whistler (RMOW), replaced 25 diesel buses with 25 Compressed Natural Gas (CNG) buses in regular service at Whistler Regional Transit. The complete transition will occur at the start of the next calendar year. This makes the Whistler fleet 100% CNG operating. Compared to diesel, the primary benefits of CNG buses are lower and more stable fuel prices, quieter engines and simplified emission systems.

In partnership with the Regional District of Nanaimo and with additional support from FortisBC under the Natural Gas for Transportation Incentive Program, the Nanaimo Transit Centre is now wholly CNG operated.

Fleet expansion and replacement of older diesel buses continued in 2017. BC Transit purchased 63 new heavy duty diesel buses to replace older vehicle models. In early 2018, BC Transit placed an order for 39 Vicinity buses to replace older buses.



Vicinity Bus

### ***Non-revenue fleet***

Building from Plug-in BC, BC Transit has been investigating options for procurement within the Non-Revenue Vehicle Replacement Project. This includes the replacement of six Transit Supervisor vehicles and an expansion of an additional unit with seven Toyota Highlander hybrids, which have improved fuel efficiency over the vehicles that they are replacing.

### ***BC Scrap-it Program***

The Victoria Regional Transit System offers a monthly pass incentive for vehicle owners to scrap their older, heavier-polluting vehicles and adopt transit. Seven of these eco-passes were issued in 2017. Implementation of this program removed 89.4 Metric tonnes of GHGs that would have otherwise been emitted in 2017.

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



The newest vehicle in BC Transit's non-revenue fleet, a Nissan Leaf-battery electric car travelled more than 6,000km in 2017 avoiding more than 910kg of GHGs (compared to an incumbent hybrid vehicle).

## B. STATIONARY FUEL COMBUSTION – FACILITIES

Variability of BC Transit facilities' GHG emissions is attributed to a decrease in ambient temperatures across sites, a variety of site expansions and mechanical system modifications. To reduce emissions, continued efficiency improvements occurred at Victoria Regional Transit facilities. These included upgrades to the Langford Transit Centre (LTC) yard lighting and upgrades to the Victoria Transit Centre (VTC) building and fuel island lighting. Additionally, energy retrofits occurred at VTC, including installation of a power meter to monitor consumption, a roof replacement, added insulation, window replacements and upgraded HVAC units.



Langford Transit Centre Facility

# Actions Planned for 2018

- BC Transit will implement an expanded CNG bus fleet and increased fueling infrastructure at the Whistler Transit System in early 2018. This will make Whistler the third regional district to have a 100% CNG fleet.
- BC Transit will continue to seek opportunities to deploy additional CNG buses in communities throughout the province as it works to replace nearly half of the provincial fleet (about 400 buses) over the next several years.
- More than 39 heavy and light duty buses will be delivered in 2018, replacing older, heavier-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.
- Through the Public Transit Infrastructure Fund (PTIF), BC Transit will continue building three new transit facilities, one each in Campbell River, Central Fraser Valley and Cowichan Valley. Though these locations will be built to accommodate fleet expansion, it is expected that the energy consumption per area will be reduced via new technology and building practices.
- Also through PTIF, BC Transit will seismically upgrade the eastern portion of the Victoria Transit Centre (VTC) garage and will re-allocate maintenance duties to Langford Transit Centre. Through this redesign, efforts will be made to increase energy and water efficiency at both locations.
- BC Transit will enter into an agreement to hire a Senior Energy Specialist in a term position to access building energy usage and develop retrofit strategies to replace older, less-efficient building systems and assist in the design of new builds.
- BC Transit will continue to work with local governments to extend the Douglas Street Transit Priority Lanes in Victoria. The priority lanes are designed to shorten travel times for transit customers, increase the reliability of public transit and reduce harmful GHG emissions by limiting idling and reducing the number of vehicles on the road.
- The wastewater treatment system at VTC will be replaced at the end of 2018, allowing for better water treatment. This may lead to options to further conserve water use and thus reduce associated energy demands.
- BC Transit will continue to implement initiatives to reduce paper usage and carbon print produced. A few steps being taken are to replace the A3 office printers with A4 printers that perform the same function, but are more energy efficient. This system will have the lowest “energy star” rating possible and will accept recycled content paper. Also, the printing will be tracked using employee passes that would need to be swiped on the printer to start printing.
- 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 continue to develop the framework for a Climate Resiliency and Adaptation Action Plan based on consultation with the Climate Action Secretariat.

- BC Transit will explore opportunities for the use of renewable natural gas in a CNG transit fleet with FortisBC.
- BC Transit will continue to work to align with Provincial initiatives in the Climate Leadership Plan, BC on the Move and the Pan-Canadian Framework on Clean Growth and Climate Change.

## Links to Other BC Transit Information Relevant to Sustainability

### **Government Mandate Letter – 2016/2017**

<https://bctransit.com/servlet/documents/1403645653304>

### **BC Transit Service Plan 2015 – 2018**

<https://bctransit.com/servlet/documents/1403642453954>

### **BC Transit 2015 – 16 Annual Report**

<https://bctransit.com/servlet/documents/1403646162553>

### **BC Transit Sustainability**

[http://bctransit.com/\\*/about/sustainability](http://bctransit.com/*/about/sustainability)

### **BC Transit Future Plans**

[http://bctransit.com/\\*/corporate-reports/strategic-plan-2030](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>

### **BC Transit is a member of the Canadian Urban Transit Research & Innovation Consortium (CUTRIC)**

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



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# Part 1: CNAR Survey

## 1. General Information

Name: Geoff Huber

Contact Email: geoff\_huber@bctransit.com

Organization Name: BC Transit

Sector: Crown

## 2. Stationary Sources (eg. Buildings, Power Generators): Fuel Combustion, Electricity use, Fugitive Emissions.

During 2017, did your organization take any of the following actions to support emissions reductions from buildings? (please select all that apply)

Performed energy retrofits of the organization's building(s)

2. Stationary Sources - Other? Please specify: Constructing and improving old maintenance facilities at Abbotsford, Campbell River, Cowichan Valley and Duncan to energy efficient and modern standard facilities.

If you selected "*Performed energy retrofits of the organization's building(s)*":

How many buildings were retrofitted?: 2

If you selected "*Built, or are building new LEED Gold or other "Green" buildings*":

How many new "Green" buildings?:

Did your Organization perform any retrofits during 2017? Please describe briefly:

Performed energy efficient lighting upgrades, installed a power meter to monitor consumption, roof replacement with added insulation, upgraded heating ventilation and air-conditioning units, as well as window replacements. Installed energy tracking equipment and software for the HVAC systems of the Administration building in Victoria.

## 2a. Stationary Sources (eg. Buildings, Power Generators): Fuel Combustion, Electricity use, Fugitive Emissions.

Please briefly describe your organization's plans to continue reducing emissions from its stationary sources:

### a) Over the next 1-5 years

Incorporating more efficient heating, ventilation and air conditioning systems across the province in our owned or leased facilities. Smarter and scheduled heating and cooling control systems (DDC) will be installed for efficiency purposes where possible. Hot water, boilers, compressors and lighting will all be reviewed for efficiency upgrades.

### b) Over the following 6-10 years

Continue to look towards emerging energy efficient heating, ventilation and air conditioning systems. Whenever possible incorporate green technology and when appropriate green design to reduce all emissions, this includes replacing outdated systems with more energy conscious substitutes. As smarter systems emerge, aggregate systems will have scheduled and monitored heating and cooling to reduce the waste of energy while optimizing employee comfort.

## 3. Mobile Sources (Vehicles, Off-road/portable Equipment): Fuel Combustion:

During 2017, did your organization take any of the following actions to support emission reductions from its mobile sources? (please select all that apply)

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

If you selected "*Replaced existing vehicles with more fuel efficient vehicles (gas/diesel)*":

How many vehicles?: 65

If you selected "*Replaced existing vehicles with hybrid or electric vehicles*":

How many vehicles?:

## 3a. Mobile Sources (Vehicles, Off-road/portable Equipment): Fuel Combustion:

Please briefly describe your organization's plans to continue reducing emissions from its mobile sources:

### a) Over the next 1-5 years

All BC Transit employees have bus passes. Pool cars (hybrids and battery-electric) 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 6,000 kms in 2017 avoiding more than 960 kg GHG compared to an incumbent hybrid vehicle. The business case was worked on and approved to replace current hybrid vehicles for our Transit Supervisors with newer more efficient hybrid vehicles.

### b) Over the following 6-10 years

Continue to distribute bus passes to employees. When appropriate invest in hybrid and electrical pool cars and encourage telecommunications in lieu of in-person meetings to reduce travel. Replace existing fleet with newer diesel technology, CNG and, if technology permits, battery electric buses.

## 4. Supplies (Paper): Indicate which actions your PSO took in 2017:

During 2017, did your organization take any of the following actions to support emissions reductions from paper supplies? (please select all the apply)

Had an awareness campaign focused on reducing office paper use; Had a policy requiring the purchase of recycled content paper

If you selected "*Had a policy requiring the purchase of recycled content paper*":

State the required recycled content here (30%, 50%, 100%): 30

If you selected "*Had a policy requiring the purchase of alternate source paper (bamboo, hemp, wheat, etc)*", which type of alternate source paper did you use?

Please briefly describe your organization's plans to continue reducing emissions associated with its office paper use in future years.

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.

## 5. Other Sustainability Actions

### a) Business Travel

**During 2017, did your organization take any of the following actions to support emissions reductions from business travel? (please select all that apply)**

Encouraged alternative travel for business (e.g. bicycles, public transit, walking); Encouraged or allowed teleworking or working from home

### b) Education/Awareness

**During 2017, did your organization have any of the following programs or initiatives to support sustainability education and awareness? (please select all that apply)**

A Green, Sustainability or Climate Action Team; Support for professional development on sustainability (e.g. workshops, conferences, training); Supported or provided education to staff about the science of climate change, conservation of water, energy and/or raw materials

### c) Other Sustainability Actions

**During 2017, did your organization have any of the following programs or initiatives to support sustainability? (please select all that apply)**

A water conservation strategy which may include a plan or policy for replacing water fixtures with efficient models; An operations policy or program to facilitate the reduction and diversion of building occupant waste (e.g., composting, collection of plastics, batteries) from landfills or incineration facilities; Green procurement standards for goods (e.g., office furniture, etc.)

5b) Other Sustainability Actions - Other? Please specify: BC Transit is a member of the U-Pass and BC Bus Pass programs, which annually helps to provide discounted transit passes for over 46,000 students attending the public post-secondary institutions and over 25,000 low income seniors and people with disabilities across the province. Fully accessible handyDART provides service to over 2 million passengers each year.