



Carbon Neutral Action Report | 2019

Executive Summary

In response to increasing demand in both urban and regional connections, BC Transit has experienced significant growth over the last five years. Ensuring services remain accessible, affordable and sustainable, BC Transit has prioritized meaningful investments to meet customers' needs by the extension of service hours and increasing the fleet with the addition of more buses.

Greenhouse Gas (GHG) emissions reported by BC Transit are primarily from the operation of the bus fleet. Under the Province's CleanBC, cleaner transportation will take a prominent role to meeting GHG reduction goals. In support of these goals and while reducing its emissions, BC Transit unveiled its Low Carbon Fleet Program in 2019. This program aims to transition the entire fleet to GHG reduction technology through a replacement strategy and continued fleet expansion.

The evolution of the fleet to low carbon technology is also a key action item in BC Transit's new strategic plan. BC Transit is not only planning to create more responsive and reliable services and transition the fleet to electric, it also sets to embark on a vision to build supportive and greener transit infrastructure. Investment in infrastructure not only enables the transition of the fleet to these alternative technologies but will also develop Rapid Transit corridors which will increase mode shift to transit and reduce GHG emissions.

In 2019, with the continued fleet expansion and replacement of older diesel buses, BC Transit purchased an additional nine (9) Compressed Natural Gas (CNG) buses for service in the Resort Municipality of Whistler and the City of Kamloops transit systems. In addition, BC Transit continued toward the commissioning of CNG fueling infrastructure at the Langford Transit Centre, which will allow for the introduction of a CNG fleet to the Victoria Regional Transit System.

With the launch of the Low Carbon Fleet Program and plans to deploy almost 100 CNG buses in 2020, BC Transit will continue to work with its government, operating and business partners to further encourage ridership growth, support GHG reduction investments and deliver transportation services our customers can rely on.



Aaron Lamb

Vice President,
Asset Management
Chief Sustainability Officer
May 29, 2020

DECLARATION STATEMENT

This Carbon Neutral Action Report for the period January 1, 2019 to December 31, 2019 summarizes our emissions profile, the total offsets to each net-zero emissions, the actions we have taken in 2019 to reduce greenhouse gas emissions and our plans to continue reducing emissions in 2020 and beyond.

The emission profile in this report is from 2018, does not reflect any adjustments to 2018 values, and will act only as an estimate for carbon accounting. Accrual of proper emission reporting and offsetting from the 2019 reporting period will occur in 2021 as per the Directive issued March 31, 2020.

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 2019 (TCO₂E)

As per the Directive issued March 31, 2020, each PSO will use their 2018 GHG Emissions as a placeholder for the purposes of their 2019 CNAR (from CGRT webpage):

Total Emissions (TCO ₂ e)	60,650
Total BioCO ₂ (TCO ₂ e)	1,817
Total Offsets (TCO ₂ e)	1,118
Offset Investment (\$25 per TCO ₂ e)	\$27,950
[Total Offsets x \$25/tCO ₂ e]	

RETIREMENT OF OFFSETS

In accordance with the requirements of the Climate Change Accountability Act and Carbon Neutral Government Regulation, BC Transit is responsible for arranging for the retirement of the offsets obligation reported above for the 2019 calendar year, together with any adjustments reported for the past calendar years (if applicable). BC Transit hereby agrees that, in exchange for the Ministry of Environment (Ministry) and Climate Change Strategy ensuring that these offsets are retired on the Organization's behalf, the Organization will pay within 30 days, the associated invoice to be issued by the Ministry in an amount equal to \$25 per tonne of offsets retired on its behalf plus GST.

Aaron Lamb

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Actions Taken in 2019 to Minimize Emissions

Greenhouse gas (GHG) emissions per service hour (a Key Performance Indicator) were 27.0kg CO₂e per service hour in the 2019/20 fiscal year (a decline from 27.5 last year). Service hour emissions have shown modest but steady declines since 2010, even with significant service hour increases.

A. MOBILE FUEL COMBUSTION

Revenue Fleet:

In 2019, BC Transit announced its Low Carbon Fleet program. The program aligns with the Province of BC's CleanBC plan, supports provincial targets for greenhouse gas (GHG) emissions, and supports local government climate action goals. The program will move BC Transit to a fully electric bus fleet to provide customers with a cleaner, quieter, and more comfortable transportation journey.

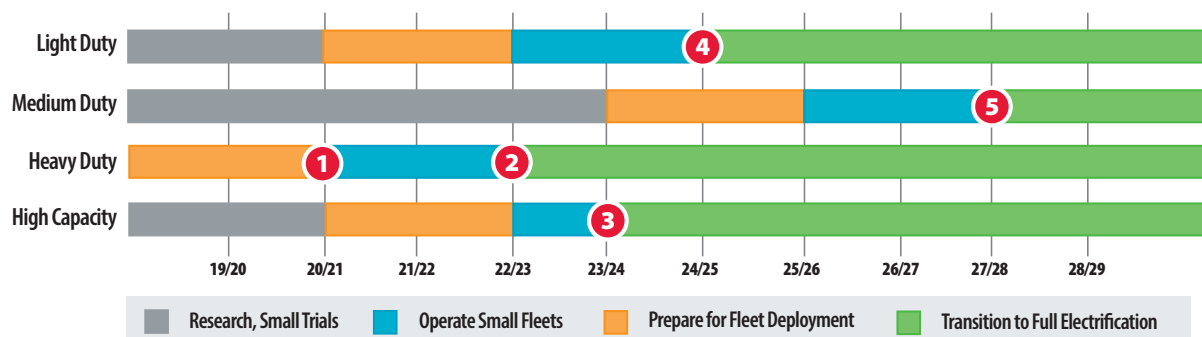
BC Transit intends to stop purchasing heavy-duty diesel buses by 2023, with a target of creating a zero emission fleet in all vehicle classifications by 2040. The low carbon fleet program focuses on four principles:

- Transitioning vehicles to electric propulsion based on the fleet replacement plan
- Bridging transition to electric with renewable fuels
- Using business cases to guide investment decisions
- Developing partnerships

Core to this program is a 10-year fleet replacement strategy to replace over 1200 existing buses and expand the fleet by an additional 350 buses by using the potential of advanced GHG reducing technology.

Key Milestones

- 1 2020/2021 – Deploy the first 10 heavy duty battery electric buses (BEBs) in Victoria
- 2 2022/2023 – Begin purchasing only electric heavy duty buses
- 3 2023/2024 – Begin purchasing only electric high capacity buses
- 4 2024/2025 – Begin purchasing only electric light duty buses
- 5 2027/2028 – Begin purchasing only electric medium duty buses



Fleet expansion and replacement of older diesel buses continued in 2019. BC Transit purchased an additional nine (9) CNG buses for service in the Whistler and Kamloops transit systems. These buses continue to provide service while producing less GHGs than incumbent diesel buses.

In 2019, BC Transit continued toward the commissioning of CNG fueling infrastructure at the Langford Transit Centre, which will allow for the introduction of a CNG fleet to the Victoria Regional Transit System. Expected completion is in April of 2020.

Non-revenue fleet

In 2019, BC Transit added one additional hybrid vehicle to the Transit Supervisor fleet. The fleet is comprised of eight (8) Toyota Highlander hybrids, which has improved fuel efficiency over the vehicles that they replaced.

For regional movements of our administrative employees, BC Transit employs a combination of an all battery electric pool car fleet and transit services.

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. Twenty-four of these eco-passes were issued in 2019. Implementation of this program removed 286.91 tonnes of CO₂e that would have otherwise been emitted in 2019.

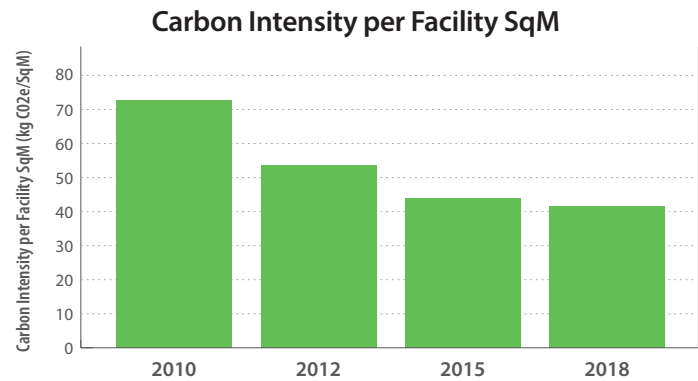


CNG Bus

B. STATIONARY FUEL COMBUSTION – FACILITIES

In 2019, BC Transit adopted a policy to have LEED Gold New Building standard or equivalency for future Operations and Maintenance facility projects. The upcoming new Victoria handyDART facility design will meet this policy objective.

In partnership with FortisBC, BC Transit continued the use of a Senior Energy Specialist position to assess building energy usage and develop retrofit strategies to replace older, less-efficient building systems and assist in the design of new builds. Energy audits of Victoria handyDART, Fort St. John, Dawson Creek, and Kamloops were subsequently completed. Following an energy audit completed in 2018, the transit facility in Trail underwent a lighting retrofit from T12 to T8 fluorescent to reduce energy consumption.



A radiant additive is being trialed at the Vernon and Kamloops facilities. This additive aims to reduce energy consumption by 10-15% by reducing the surface tension of water in boiler systems that improves heat transfer.



Wastewater Treatment Facility – Victoria

To reduce energy consumption at the Whistler Transit Centre, the facility was retrofitted with two high efficiency boilers and digital controls.

Two energy conservation days were celebrated at all five Victoria Regional Transit facilities in 2019 to facilitate a culture of energy awareness. On these days, the facilities had a temporary heating set-point reduction as well as energy conservation pledges and educational materials were distributed to employees.

The wastewater treatment system was commissioned at Victoria Transit Centre in 2019. This may lead to options to further conserve water use and thus reduce associated energy demands.

The BC Transit Green Team participated in regional green initiatives such as Bike to Work Week, Help Fill a Dream and Garden Planting Day.

Actions Planned to Continue Reducing Emissions in 2020

New BC Transit facilities are under construction in Cowichan Valley and Campbell River. They will be commissioned in the spring of 2020. To reduce water consumption, the Cowichan Valley facility will include a rain-barrel collection system that will be used for irrigation of the road frontage. Both these facilities are designed and constructed to maintain CNG buses in the future.

A new facility is under construction in the Central Fraser Valley area. This facility will be commissioned in the middle to late fall of 2020. Construction of this facility will accommodate the replacement of heavy-duty diesel buses with CNG buses and will include onsite CNG fueling infrastructure. Lastly, installation of a CNG fueling station at the Langford Transit Centre and facility modifications implemented to maintain a fleet of CNG buses for the Victoria Regional Transit System.

BC Transit will analyze data from the radiant boiler system additive trial at the Vernon and Kamloops facilities. Based on the results of this trial, other facilities will be considered for further implementation.

BC Transit plans to retrofit equipment to provide more energy efficiencies at various facilities throughout BC including:

- Bus wash motors at the Kamloops facility
- Bush wash air curtain at the Vernon facility
- Parts cleaner at the Langford facility

A review and update to BC Transit's Environmental Management System will be completed that will include current energy management aspects. Data for BC Transit's energy and water consumption as well as waste management will be collected and reviewed to establish baseline data.

With the Low Carbon Fleet Program, BC Transit will be significantly investing in the purchase of CNG buses to either expand or replace current fleet vehicles including:

- 15 Heavy-Duty CNG expansion buses
- 48 Heavy-Duty CNG replacement buses
- 34 Medium-Duty CNG replacement buses

BC Transit will continue to develop the framework for a Climate Resiliency and Adaptation Action Plan based on consultation with the Climate Action Secretariat.

Links to Other BC Transit Information Relevant to Sustainability

Government Mandate Letter – 2018/2019

<https://www.bctransit.com/documents/1529703094471>

BC Transit Service Plan 2019/20– 2020/21

<https://www.bctransit.com/documents/1529703095612>

BC Transit 2018 – 19 Annual Report

<https://www.bctransit.com/documents/1529704868282>

BC Transit Sustainability

<https://bctransit.com/about/sustainability>

BC Transit Strategic Planning

<https://www.bctransit.com/transforming-your-journey>

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

<https://scrapit.ca/incentivechoices/>

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

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



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Carbon Neutral Action Report Survey - 2019

Public sector organizations (PSOs) are required to complete this survey, in addition to a Carbon Neutral Action Report (CNAR) as mandated by BC's [Climate Change Accountability Act](#) and the [Carbon Neutral Government Regulation](#).

Due to the COVID-19 pandemic, the following [Directive](#) was issued on March 31, 2020. Certain deadlines were also extended for the 2019 reporting year (see below).

March 31, 2020 Directive:

Under my authority as the Director for the purposes of the Act, and under the authority delegated to me in Section 6 of the Carbon Neutral Government Regulation, I hereby direct that all ministries and Public Sector Organizations covered by the Carbon Neutral Government requirement shall use their 2018 GHG emissions as a temporary estimate for their actual 2019 GHG emissions, for the purposes of the 2019 Carbon Neutral Action Reports and 2019 Carbon Neutral Government reporting required under the Climate Change Accountability Act.

Neil Dobson, Executive Director, Clean BC Implementation
Climate Action Secretariat

Although 2018 emissions data will be used as a placeholder for 2019, **all other (qualitative) components of the CNAR and CNAR Survey are to be completed with information from 2019 (e.g., actions taken or planned to reduce emissions)**. The only change to the survey is that the deadline was extended by one month to June 30, 2020.

This survey is divided into two parts:

Part 1 - Will be made public on the Climate Action Secretariat (CAS) [website](#) after June 30, 2020; however, it will not be appended directly to each individual PSO CNAR as was done in previous years. This section collects details about actions taken or planned to reduce emissions and is intended to supplement the legislative requirements in your CNAR.

Part 2 - Will NOT be made public. Information you provide in this section is important and will be used internally to help CAS staff with planning for emissions reduction and climate change adaptation initiatives. Although not required, PSOs are highly encouraged to complete Part 2.

Note: Survey progress can be saved at any time by clicking the "Save and continue later" button at the bottom of each page. A new window will open and you will be asked to provide your name and email. An email will be sent to you from Carbon.Neutral@gov.bc.ca with the subject line: "Questionnaire Link", which will include a hyperlink for the "Project: Carbon Neutral Action Report Survey – Broader Public Sector 2019". You can then continue responding at another time or email the hyperlink to a colleague to complete remaining section(s).

May 29, 2020	<ul style="list-style-type: none">The final, signed version of the CNAR (or Small Emitters Form) must be submitted by email to: Carbon.Neutral@gov.bc.ca
June 30, 2020*	<ul style="list-style-type: none">Ministry of Environment and Climate Change Strategy must post a final CNAR for each organization on the BC Government's CNG website and each PSO is encouraged to post the report on their website.The CNAR Survey (optional for Small Emitters) must be completed and submitted online. *Deadline extended from May 29, 2020.<u>All offset invoice payments must be submitted to CAS.</u>
Sept 30, 2020*	<ul style="list-style-type: none">Clean Government Reporting Tool (CGRT) Data Entry must be completed for the 2019 reporting year.

	*Deadline extended from April 30, 2020.
Oct 15, 2020*	<ul style="list-style-type: none"> • Self-Certification checklist must be completed, signed and submitted by email to: Carbon.Neutral@gov.bc.ca. *Deadline extended from May 15, 2020.

*See the [Carbon Neutral Government – Program Requirements website](#) for more information on program requirements, timelines and templates.

PART 1 - Included as part of your public CNAR report.

Reminder that Part 1 will be made public on the CAS [website](#).

Contact Name:	<i>Geoff Huber</i>
Contact Email:	<i>Geoff_Huber@BCTransit.com</i>
Organization Name:	<i>BC Transit</i>
Role – Please select the best category for your current role with your organization. If more than one individual completed the survey, multiple categories may be selected:	Other - Please Specify: <i>Manager, Environmental Sustainability</i>
Please select your sector:	Crown (CR)

Stationary Sources (e.g. Buildings, Power Generators): Fuel Combustion, Electricity use, Fugitive Emissions.

Actions taken by your organization in 2019 to support emissions reductions from buildings

Do you have a strategy to reduce emissions from stationary sources?
<i>Yes</i>

Whether you have a strategy or not, briefly describe your organization's plans to continue reducing emissions from stationary sources:

Over the medium-term term (1-5 years)
<i>BC Transit has formally committed to building to LEED Gold certification standard or equivalency for new transit operation and maintenance (O&M) facilities. In addition, BC Transit will continue to look towards emerging energy efficient heating, ventilation and air conditioning systems. As smarter systems emerge, aggregate systems will have scheduled and monitored heating and cooling to reduce the waste of energy and optimizing employee comfort.</i>
Over the long term (6-10 years)
<i>BC Transit will continue to look towards emerging energy efficient heating, ventilation and air conditioning systems. As smarter systems emerge, aggregate systems will have scheduled and monitored heating and cooling to reduce the waste of energy and optimizing employee comfort.</i>

Please describe your strategy's goals (if any) related to energy audits.

Just completed energy audits of our in scope facilities in 2019. the information gathered has been used to guide decisions on equipment replacement and upgrades.

What % on average of your building portfolio has an energy audit completed each year (if any)?

Over the past 3 years, BC Transit has completed energy audits on all owned/leased operations and maintenance facilities.

Please describe your strategy's goals (if any) related to building retrofits.

Along with energy audits, recommended retrofit measures found to be cost effective as budgeting allows.

What % on average of your building portfolio is retrofitted each year in the following categories (if any) - click here for further information:

10

Minor retrofits (e.g. low cost, easy to implement measures including caulking, lighting, adding roof insulation, etc.)

10

Major retrofits (e.g. replacing windows and doors, equipment replacement such as boilers, etc.)

10

Deep retrofits (e.g. replacing roof, replacing the heating, ventilation and air-conditioning system with a renewable technology like a ground-source heat pump, etc.)

0

Please describe your strategy's re/retro-commissioning goals (if any)?

N/A

What % on average of your building portfolio do you recommission each year?

0

Do you keep records of Refrigerant gases¹ category and refilling volumes?

[1] Fugitive emissions from stationary cooling equipment are attributed to the leakage and loss of HFC and PFC based coolants from air conditioning and commercial type refrigeration systems. Coolant loss can occur during the manufacturing, operation, and disposal of such equipment. Gases that may be reported via CGRT include HFC R-134, HFC R-134a, HFC R-404a, HFC R-407c, HFC R-410a.

No

What, if any, mitigation approaches have been considered? Please describe.

n/a

How many newly constructed buildings received at least LEED Gold certification in 2019?

There were no newly constructed buildings in 2019.

How many newly constructed buildings did not receive LEED Gold certification?

There were no newly constructed buildings in 2019.

Please explain why LEED Gold certification was not obtained for those new buildings.

There were no newly constructed buildings in 2019.

Other actions? Please describe briefly:

N/A

Mobile Sources (Fleet Vehicles, Off-road/portable Equipment): Fuel Combustion:

Actions taken by your organization in 2019 to support emissions reductions from mobile sources?

Do you have a strategy to reduce emissions from mobile sources?

Yes

Whether you have a strategy or not, briefly describe your organization's plans to continue reducing emissions from mobile sources:

Over the medium-term term (1-5 years)

In 2019, BC Transit announced its Low Carbon Fleet program. The program aligns with the Province of BC's CleanBC plan, supports provincial targets for greenhouse gas (GHG) emissions, and supports local government climate action goals. The program will move BC Transit to a fully electric bus fleet to provide customers with a cleaner, quieter, and more comfortable transportation journey.

With the Low Carbon Fleet Program, BC Transit will be significantly investing in the purchase of CNG busses in 2020 to either expand or replace current fleet vehicles including:

- 15 HD CNG expansion buses (3 Whistler, 12 Langford Transit Center)*
- 22 HD CNG replacement buses (Langford Transit Center)*
- 17 HD CNG replacement buses (Central Fraser Valley or Langford Transit Center)*
- 34 MD CNG replacement buses (25 Langford Transit Center, 9 Central Fraser Valley)*
- 9 HD CNG replacement buses (Central Fraser Valley)*

Other key milestones of the Low Carbon Fleet Program include:

2021/2022 – Deploy the first 10 heavy duty battery electric buses (BEBs) in Victoria

2023/2024 – Begin purchasing only electric heavy duty buses

Over the long term (6-10 years)

Continuing with the key milestones of the Low Carbon Fleet Program include:

2024/2025 – Begin purchasing only electric light duty buses

2027/2028 – Begin purchasing only electric medium duty buses

How many fleet vehicles did you purchase from the following categories:

Electric Vehicle – EV - (e.g., Nissan Leaf, Chevy Bolt)

0

“Plug In” Electric Vehicle – PHEV (e.g., plug-in Prius, Chevy Volt)

0

Hybrid vehicle – HEV – non “Plug In”- (e.g., Toyota Highlander Hybrid)

1

Hydrogen fuel cell vehicle

0

Natural gas/propane

11

Gas/diesel vehicle

0

If you purchased new gas/diesel vehicles, can you briefly explain why vehicles from the other categories were not chosen?

N/A

Actions taken by your organization in 2019 to support emissions reductions from mobile sources? (Continued)

How many existing EV charging stations does your organization have in each category:

Level 2?

2

Level 3?

2

How many level 2 stations (if any) are specifically for your fleet vehicles?
As defined as Level 2 stations only your organization's fleet vehicles may use

2

How many level 3 stations (if any) are specifically for your fleet vehicles?
As defined as Level 3 stations only your organization's fleet vehicles may use

2

How many EV charging station(s) did you install in 2019 in each category:

Level 2?

0

Level 3?

0

How many level 2 stations (if any) were installed specifically for your fleet vehicles?
As defined in the previous section

4

How many level 3 stations (if any) were installed specifically for your fleet vehicles?
As defined in the previous section

0

Please briefly describe any other related actions, (e.g. charging station feasibility studies, electrical panel upgrades, etc.)

N/A

Please indicate the total number of the vehicles in the following vehicle classes that are in your current fleet

Definitions:

- Light duty vehicles (LDVs) are designated primarily for transport of passengers <13 and GVWR<3900kg
- Light duty trucks (LDTs) are designated primarily for transport of light-weight cargo or that are equipped with special features such as four-wheel drive for off-road operation (include SUVs, vans, trucks with a GVWR<3,900kg)
- Heavy duty vehicles (HDV) includes vehicles with a GVWR>3,900 kg (e.g. ¾ tonne pick-up truck, transport trucks)

Light duty vehicles (LDVs)

Electric Vehicles – EV - (e.g., Nissan Leaf, Chevy Bolt)
3
“Plug In” Electric Vehicle – PHEV -- (e.g., plug-in Prius, Chevy Volt)
0
Hybrid vehicles – HEV – (e.g., non “Plug In”- older Toyota Prius, Toyota Camry hybrid)
8
Hydrogen fuel cell vehicles
0
Natural gas/propane
0
Gas/diesel
0

Light duty trucks (LDTs)

Electric Vehicles – EV
0
“Plug In” Electric Vehicle – PHEV
0
Hybrid vehicles – HEV – (e.g., non “Plug In”- older Ford Escape Hybrid, older Chevrolet Silverado pickup hybrid, etc)
0
Hydrogen fuel cell vehicles
0
Natural Gas/propane
0

Gas/diesel

0

Heavy duty vehicles (HDV)

Electric Vehicles – EV

0

“Plug In” Electric Vehicle – PHEV

0

Hybrid vehicles – HEV – (e.g., non “Plug In”)

4

Hydrogen fuel cell vehicles

0

Natural Gas/propane

166

Gas/diesel

912

Actions taken by your organization in 2019 to support emissions reductions from paper supplies.

Briefly describe your organization’s plans to continue reducing emissions from paper use:

Over the medium-term (1-5 years)

BC Transit will move to electronic pay stubs as a means of reducing paper emissions from paper use in 2020.

Over 99% of all paper purchased under reporting guidelines is between 30-40% recycled content. BC Transit continues to review opportunities to further increase its post-consumer content in purchased paper.

Double sided printing is encouraged wherever possible.

Over the long term (6-10 years)

BC Transit is looking towards electronic communication with NextRide technology to reduce the number of printed riderguides.

Do you have an awareness campaign focused on reducing office paper use?

No

Purchased alternate source paper (bamboo, hemp, wheat, etc.)

No

Other 2019 actions, please specify

N/A