

**TO:** Chair and members  
ENVIRONMENT COMMITTEE **DATE:** 2021 Mar 10

**FROM:** DIRECTOR CORPORATE SERVICES **FILE:** 33000-02  
DIRECTOR PARKS, RECREATION AND  
CULTURAL SERVICES

**SUBJECT: GREEN FLEET & EQUIPMENT UPDATE**

**PURPOSE:** To update Council on the status of Burnaby's Green Fleet and Equipment transition towards carbon neutrality, as part of the City Energy Strategy and commitment to the climate emergency response.

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**RECOMMENDATION:**

1. **THAT** the Committee recommend Council receive this report for information.

**REPORT****1.0 INTRODUCTION**

On 2019 September 9, the City of Burnaby adopted a resolution declaring a climate emergency and updated the City's community carbon pollution reduction targets. The targets are 45% reductions by 2030, 75% by 2040, and to be carbon neutral by 2050. At the 2019 September 3 Environment and Social Planning Committee (now the Environment Committee), a motion was adopted that asked staff to report back on "a strategy to purchase vehicles and trucks which use alternate fuel and electric vehicles and trucks" due to the heavy reliance in Fleet on fossil fuels. The subsequent Climate Action Framework, approved by Council 2020 July 6, committed the City to demonstrate Climate Leadership, including a City Energy Strategy. The City Energy Strategy, also approved by Council 2020 July 6, committed the City to achieve carbon neutrality a decade earlier than the community, by 2040. The Green Fleet & Equipment Big Move set out an action plan to achieve this transition for the vehicles and equipment within the city's Fleet.

The purpose of this report is to update Council on the status of Green Fleet and Equipment transition. Subsequent reports will be advanced for Council's consideration as specific initiatives progress.

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## **2.0 POLICY SECTION**

A Green Fleet aligns with the City of Burnaby's Corporate Strategic Plan by supporting the following goals and sub-goals of the Plan:

### **Goal**

- A Safe Community
  - Emergency services –  
Provide responsive emergency services
- A Healthy Community
  - Healthy environment –  
Enhance our environmental health, resilience and sustainability
- A Dynamic Community
  - Community development –  
Manage change by balancing economic development with environmental protection and maintaining a sense of belonging
  - City facilities and infrastructure –  
Build and maintain infrastructure that meets the needs of our growing community
- A Thriving Organization
  - Organizational culture –  
Ensure that our core values are reflected in our policies, programs and service delivery
  - Financial viability –  
Maintain a financially sustainable City for the provision, renewal and enhancement of City services, facilities and assets
  - Technology and innovation –  
Support technology development and innovation to empower staff and to advance community objectives

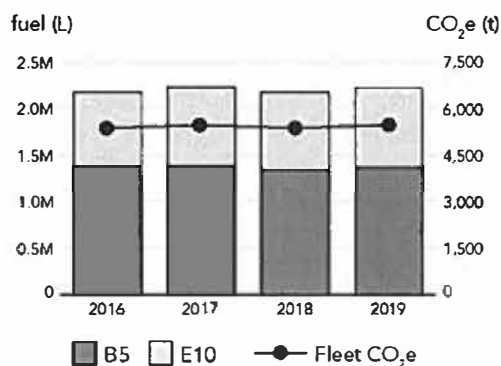
## **3.0 CURRENT FLEET MAKE-UP**

Burnaby's Fleet consists of approximately 800 vehicles and an equivalent number of equipment assets. The vehicle asset list includes smaller units such as golf carts, mowers, riding tractors and passenger cars; a range of light-duty trucks; and, heavy-duty trucks including street sweepers, solid waste, and fire response trucks. Equipment includes saws, blowers, landscape equipment and other specialty equipment. The Fleet utilizes E10 gasoline and B5 diesel fuel.

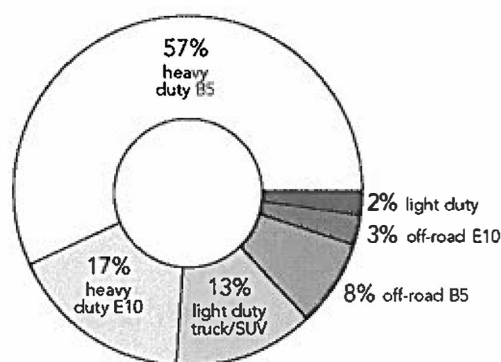
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As reported in the City Energy Strategy, the Fleet's fuel use and carbon emissions has been relatively constant for the past few years, with the majority of emissions from heavy-duty diesel vehicles such as those used in solid waste collection (Figure 1). Heavy-duty and light-duty E10 gasoline trucks comprise the next largest emissions source, while off-road vehicles and equipment, both gas and diesel, comprise just over 10%. Light-duty vehicles, such as passenger cars, produce the fewest Fleet emissions.

Fleet Fuel Use and Emissions (2016-2019)



Fleet Emissions by Source (2019)



## 4.0 OBJECTIVES

The Green Fleet and Equipment Big Move committed Burnaby to transitioning the Fleet through a primary strategy of electrification, to achieve carbon neutrality by or before 2040. The objectives are:

- To provide appropriate electric charging infrastructure at all primary and secondary vehicle and equipment sites.
- To transition vehicles and equipment away from fossil fuels, following regular replacement cycles as the technology becomes available. Note that two-thirds of Fleet has been estimated to have a neutral or positive business case for EV replacement, while price premiums are anticipated to decline over time for the remaining third.
- To reserve renewable liquid fuels, such as renewable diesel, for critical assets such as Emergency Response vehicles. Note: compressed renewable natural gas is now also being considered for some heavy-duty vehicles, as a back-up to electricity.
- To make use of the two replacement cycles between 2020 and 2040 to strategically plan the transition, taking advantage of early subsidies and later price premium reductions.
- To ensure an efficient transition via centralization of administrative processes.

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#### **4.1 Federal and Provincial Commitments**

The federal and provincial governments have made strong commitments to zero-emission vehicles, with subsidies and grants available for infrastructure upgrades and fleet vehicle purchases. For example, Natural Resources Canada's ZEVIP or Zero Emission Vehicle Infrastructure Program provides funding for electric vehicle charging and hydrogen refueling infrastructure<sup>1</sup>. Applications for ZEVIP 2021 open in March, with a June submission deadline.

The BC government is currently offering significant vehicle subsidies specifically in aid of the Fleet transition. The Specialty-Use Vehicle Incentive (SUVI) program now includes \$100,000 towards electric solid waste vehicles, as well as subsidies for low-speed vehicles such as golf carts.<sup>2</sup> Electric solid waste vehicles with automated arms are being manufactured by the Canadian Lion-Boivin partnership, with pilot availability in the market now. This is earlier than anticipated even a year ago, when the City Energy Strategy was under development.

#### **5.0 BURNABY'S GREEN FLEET & EQUIPMENT TRANSITION**

The Big Move on Fleet and Equipment committed to a planned transition. Prior to vehicle purchases, charging infrastructure must be available, which requires electrical service assessments and upgrades, electrification of parking stalls (conduit and cabling), and installation of charging systems (stations and ports). This work must be undertaken at three primary sites (City Hall, Laurel Street, Still Creek), as well as multiple secondary sites including parks maintenance areas, civic facilities, the golf courses and Fire Halls.

As charging infrastructure becomes operational, vehicles and equipment can be transitioned based on available technology. Some critical assets, such as emergency response vehicles, will remain on liquid fuels, with a future transition to a renewable, lower-carbon supply. A coordinated approach across Burnaby's departments will enable an efficient and cost effective transition.

The status of each of these areas of action is explained below.

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<sup>1</sup> The Natural Resources ZEVIP website states: "The Government of Canada is steadfast in its belief that electrification is key to decarbonizing our transportation sector and transitioning to a low-carbon future."

<https://www.nrcan.gc.ca/energy-efficiency/energy-efficiency-transportation-alternative-fuels/zero-emission-vehicle-infrastructure-program/21876>

<sup>2</sup> <https://pluginbc.ca/suvi/>

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## 5.1 Upgrade Fueling Infrastructure

Depending on the site, fueling infrastructure upgrades include bringing in additional electrical service and transformers, ensuring adequate space in electrical rooms, adding conduit and cabling, and installing Level 2 and fast-charging equipment, or EVSE (electric vehicle service equipment). EVSE installation – the actual charging ports – may be phased in with planned vehicle purchases.

**QUICK START:** Electrify City Hall compound. Capacity: 100 light duty Fleet vehicles, served by Level 2 charging. Anticipated completion date: 2021; updated date: Q2 2022.

**STATUS UPDATE: In progress.** The City Hall electrification project will see construction of a fully renovated parking lot with electrical service and electrical conduit to all stalls. EV charging ports will be purchased and installed 'just-in-time' as electric vehicles arrive. Note that this infrastructure anticipates future need, as the majority of vehicles parked at the City Hall compound will start transitioning as of 2023. The project completion date has been updated to account for bird nesting season. Integration with the City Hall campus photovoltaic solar system project, advanced at Environment Committee 2021 January 21, is being explored.

**QUICK START:** Ensure adequate electrical infrastructure at the Laurel Street Works Yard, currently under construction. Capacity: 195 light, medium and heavy duty vehicles, served by a mix of Level 2 and fast charge stations.

**STATUS UPDATE: In progress.** New electrical service with increased capacity and a new high-voltage switching kiosk have been added to the Laurel Street Works Yard project. Conduit has been added to provide Level 2 charging to all Fleet parking stalls. The electrical service capacity anticipates the future addition of up to two fast-chargers. 34 Level 2 EV charging ports will be operational on opening day. Future EV chargers and associated infrastructure can be added on an as-needed basis because the conduit and electrical service capacity will already be in place. Note that the associated future infrastructure, which includes a substation, will incur additional costs and will be identified in future capital budgets.

**ADDITIONAL PROJECT, in progress:** Electrical infrastructure upgrade at Norland to provide a backup to Laurel Street and secondary charging site for vehicles and equipment. This project provides charging certainty and improves Fleet resilience, acting as an early climate adaptation action.

**QUICK START:** Plan for infrastructure upgrades at secondary Parks facilities, including Riverway and Burnaby Mountain golf courses, to transition equipment and vehicles. Completion of infrastructure planning work: 2020. Phased infrastructure installation at secondary locations to start in 2021.

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**STATUS UPDATE: In progress.** Planning is underway, including assessment of current electrical infrastructure and capacity.

**FUTURE:** Plan for electrical infrastructure upgrade at Still Creek Works Yard, for light, medium and heavy-duty vehicles. Phased infrastructure installation to be completed by 2026.

**STATUS UPDATE: In progress.** Twelve Level 2 ports will be operational as of Q2 2021 at the Still Creek Works Yard. The electrical service upgrade allows for the addition of fast-charging at a future date. There is sufficient conduit and capacity in place to charge some heavy-duty electric vehicles, if purchased as part of a pilot. Further work is needed to design a complete transition.

**FUTURE:** Plan for infrastructure upgrades at Fire Department locations, to support the transition of suitable equipment and vehicles.

**STATUS UPDATE: In progress.** Electrical infrastructure upgrades, including increased service capacity and conduit will go into Fire Hall No. 1 as part of a combined renovation project.

## **5.2 Transition vehicles and equipment**

The transition to electric vehicles and equipment makes use of the Fleet vehicle replacement schedule, as new electric vehicles come to market and the price premium compared to traditional fuel vehicles reduces. Additional factors include the anticipated release dates of vehicles, current market trends and charging infrastructure availability.

At the time of the City Energy Strategy adoption, the transition to electric vehicles was anticipated to begin with light duty passenger vehicles and some equipment in 2020, light-duty pick-up trucks in 2023, and heavy-duty vehicles and heavy equipment in 2024. The light duty passenger vehicle transition was delayed to 2021, to allow for electrical infrastructure upgrades. Some heavy-duty vehicles are available earlier than anticipated, with significant subsidies: earlier pilot procurement is now underway, to test both the charging systems and vehicle performance.

**QUICK START:** Replace light-duty vehicles with EV through scheduled replacement, 2020-2030.

**STATUS UPDATE: On target.** Light-duty cars were slated for replacement starting in 2020, which was slightly delayed to ensure charging availability. However, the transition is still achievable within the timeframe allotted. City Hall Fleet is ordering

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a Kia Soul and a Chevrolet Bolt, to arrive in 2021; they will charge at the Deer Lake Park EV charging stalls. These vehicles will provide multiple departments with an opportunity to test the two models, prior to additional procurement going forward. The City Hall passenger car vehicles will then transition in larger numbers starting in 2022, following vehicle replacement cycles. A light-duty electric truck, operating in Solid Waste and Recycling, is now at Still Creek.

**QUICK START:** Replace equipment with electric alternative as available and through scheduled replacement, 2020-2030.

**STATUS UPDATE: On target.** In 2020, the equipment inventory across departments was reviewed for possible EV replacement. In 2021, equipment replacement will be prioritized based on technical requirements, availability, and charging infrastructure – at sites or via electric light-duty vehicles. As such, this transition is anticipated to take the full decade.

**FUTURE:** Replace heavy-duty, specialty vehicles and heavy-duty equipment as they become available and as scheduled for replacement, 2024-2039.

**STATUS UPDATE: Ahead of target.** Given the earlier-than-anticipated market availability of solid waste electric trucks, and the SUVI funding from the BC government, procurement planning is underway for a pilot electric recycle vehicle, anticipated to be operational in 2023. Compressed natural gas vehicles are also under consideration as an earlier transition option.

### 5.3 Evaluate critical assets for renewable fuels

**FUTURE:** Identify critical assets, such as specific Emergency Response vehicles, that will require the adoption of equivalent, renewable alternatives (i.e. renewable diesel hybrids) rather than electric vehicles. Timeline for critical asset list: 2024.

**STATUS UPDATE: Ahead of target.** This action had been flagged for the future, with a timeline for a critical asset list of 2024. However, the work of identifying critical assets is being undertaken ahead of schedule, and should be completed by 2023.

As noted in the City Energy strategy, the City is targeting to adopt a locally produced supply of renewable diesel by 2027 to reduce costs and supply chain concerns. In addition, work is being undertaken to consider additional alternates, such as compressed natural gas – which in future can use renewable natural gas – to provide a secondary backup fuel source in case of extensive power grid failure.

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#### 5.4 Efficiently administer and operate Burnaby's Fleet

**QUICK START:** Centralize Fleet administration within Corporate Services to efficiently administer the Green Fleet and Equipment transition. The new Green Fleet and Equipment Manager will work with Departmental Fleet Coordinators on strategic and best cost procurement and efficient disposal processes of fleet vehicles and equipment, to support an effective Green Fleet transition. Existing investments in fleet technology to optimize fleet use, maintenance, and composition will be leveraged.

**STATUS UPDATE: On target.** The Central Coordinating Fleet Committee (CCFC) meets regularly to review and update policies and processes supportive of the Fleet and Equipment transition. A Green Fleet and Equipment Manager will be in place in late March to continue work with Departments on procurement and other Fleet processes, with a focus on the green transition.

**QUICK START:** Use financial tools to support the Green Fleet transition, such as leveraging third party grant programs for associated capital costs. Capital requests to include internal carbon price in procurement reports.

**STATUS UPDATE: On target.** Burnaby has been actively pursuing funding grants supportive of the EV transition. While the City was unsuccessful in a 2020 NRCan grant application to upgrade Fleet infrastructure, due to the high demand on that grant program, 2021 grant applications are now being prepared for both provincial and federal programs. Grant funding is in place for the public charging network.

On the carbon price: the Finance Department has been assisting with incorporation of carbon emissions considerations into the budget process. Capital budget forms were revised to include carbon implications, effective budget cycle 2020. A carbon price report is being brought forward to the March 2021 Financial Management Committee.

**ON-GOING ACTION:** Continue driver/operator education and culture change, such as targeted anti-idling campaigns and other initiatives. Education and culture change, along with vehicle telematics, could reduce vehicle carbon pollution by approximately 5%.

**STATUS UPDATE: delayed due to COVID-19.** While some Departments continue with their existing driver behaviour programs, a full Fleet driver program has been delayed. It is now anticipated that this work will be rolled out across Departments in 2022.

**ON-GOING ACTION:** Continue to engage staff in fleet improvement processes, including an annual cross-departmental Fleet workshop.



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**STATUS UPDATE: delayed due to COVID-19.** While Departmental Fleet meetings on the Fleet and Equipment transition have continued, the annual cross-departmental workshop was put on hold. It is now anticipated that the cross-departmental workshops will be re-initiated in Q1 2022.

## 6.0 CONCLUSION

This report updates Council on the status of Green Fleet and Equipment Transition as it relates to City Energy Strategy. Considerable progress has been made in a short period of time, particularly on the critical step of ensuring new fueling infrastructure for electric vehicles. Burnaby will be well-placed for a transition away from fossil fuels in the Fleet. Significant emissions reductions will be achieved as the vehicle replacement progresses, particularly with more heavy-duty electrification starting in 2024.



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Copied to:     Acting City Manager  
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