

City of Vancouver

Fleet Electrification: Infrastructure and Policy

Evan Dacey
Equipment Manager
11/27/2019



Fleet and Manufacturing Services

FMS provides centralized fleet and manufacturing services for Municipal, Fire and Police operations.



Strategic Alignment – Climate Emergency

Adopted by Council, the Climate Emergency Response has key actions for the City's fleet.

Key adopted recommendations:

1. A new City-wide long-term climate target of being carbon neutral **before** 2050 and 100% renewable energy
2. By 2030, **50 percent** of the kilometers driven on Vancouver's roads will be by zero emissions vehicles ("Big Move #3").

Complements **Renewable City** target of 50% emissions reduction below 2007 levels by 2030

Strategic Alignment – Climate Emergency

Adopted by Council, the Climate Emergency Response has key actions for the City's fleet.

Key Accelerated Actions:

- 1. City Fleet:** By 2023, transition all non-emergency City fleet sedans to zero emissions vehicles, replace an additional batch of heavy-duty trucks with electric vehicles.
- 2. Fleet Charging:** Develop a charging infrastructure strategy for the City's electric vehicles to support the City Fleet action
- 3. Small Equipment:** Develop a strategy to transition small mobile equipment to electric or zero emissions technologies.

Green Fleet Plan

Incorporates Climate Emergency actions in addition to existing Greenest City and Renewable City targets.

Three Key Pillars:

1 – Electrifying the Fleet

All vehicle replacements firstly consider an electric option

2 – Fueling the Fleet

All fuel used contains a high proportion of renewable, biologically derived content

3 – Optimizing the Fleet

Ensuring all vehicle usage is optimized through technology and driver behaviour

Green Fleet Plan – Emissions Projection

Fleet GHGs (CO2e)



2030 target reached by 2023

-50%

1- Electrifying the Fleet

All vehicle replacements firstly consider an electric option

Split into 4 major projects:

1. Light Duty Vehicles
2. Medium/Heavy Duty Trucks
3. Construction and Maintenance Equipment
4. Charging Infrastructure
5. *Policy*

Goal: Reduction of **1,300 tonnes** of CO₂e annually

Internal Policies to Support Electrification

Policy acts as internal level/tool for driving towards lower emissions and increased electrification.

Should balance larger strategic goals with business unit priorities

Key policies for CoV:

- Corporate Carbon Pricing Policy
 - \$150/tonne for Scope 3 emissions
- Greenest City Action Plan
 - Green Operations Plan and Steering Committee

Transition to electric make fiscal sense **now**

Business Case for Electrification

Light Duty Electric:

- Wide range of light duty EV options
- EVs in City fleet since 2013
- Past leading edge into business as normal

Lifetime - 10 Year Life (CoV Units)

Type	Maintenance	Capital	Fuel	Total
EV	\$6,400	\$51,300	\$1,100	\$58,800
ICE	\$16,000	\$34,200	\$11,600	\$61,800
EV Savings				\$3,000

Business Case for Electrification

Key elements for EV Medium/Heavy Duty Trucks:

- Availability of trucks
- Cost of trucks (capital and operating)
- Trucks due for replacement and feasibility to go electric
- Cost of electric charging infrastructure

Hired Cascadia Consulting to develop detailed business case

Goal: Determine number of trucks in 2019-2022 capital plan to transition to electric

Business Case for Electrification

Cost Premiums:

- Capital cost of electric trucks
- Charging infrastructure

Cost Savings:

- Electricity versus diesel/gasoline
- Decreased maintenance work
- BC Low Carbon Fuel Standard credits

Non-Cash Benefits:

- Corporate Carbon Price (\$150/tonne)
- Reduction in noise pollution
- Reduction in Criteria Air Contaminants (NO_x and PM_{2.5})

Business Case for Electrification

Work still underway to determine overall plan

Areas of Focus:

- Further research into Non-Cash Benefits
 - Incorporate regional Metro Vancouver data
- Split charging station cost from electrical infrastructure cost
- Deeper dive into maintenance cost savings
- Sensitivity analysis on all assumptions to determine range of outcomes

Key Action: Pilot project in 2019-2020

Pilot Project - Vehicles

Scope:

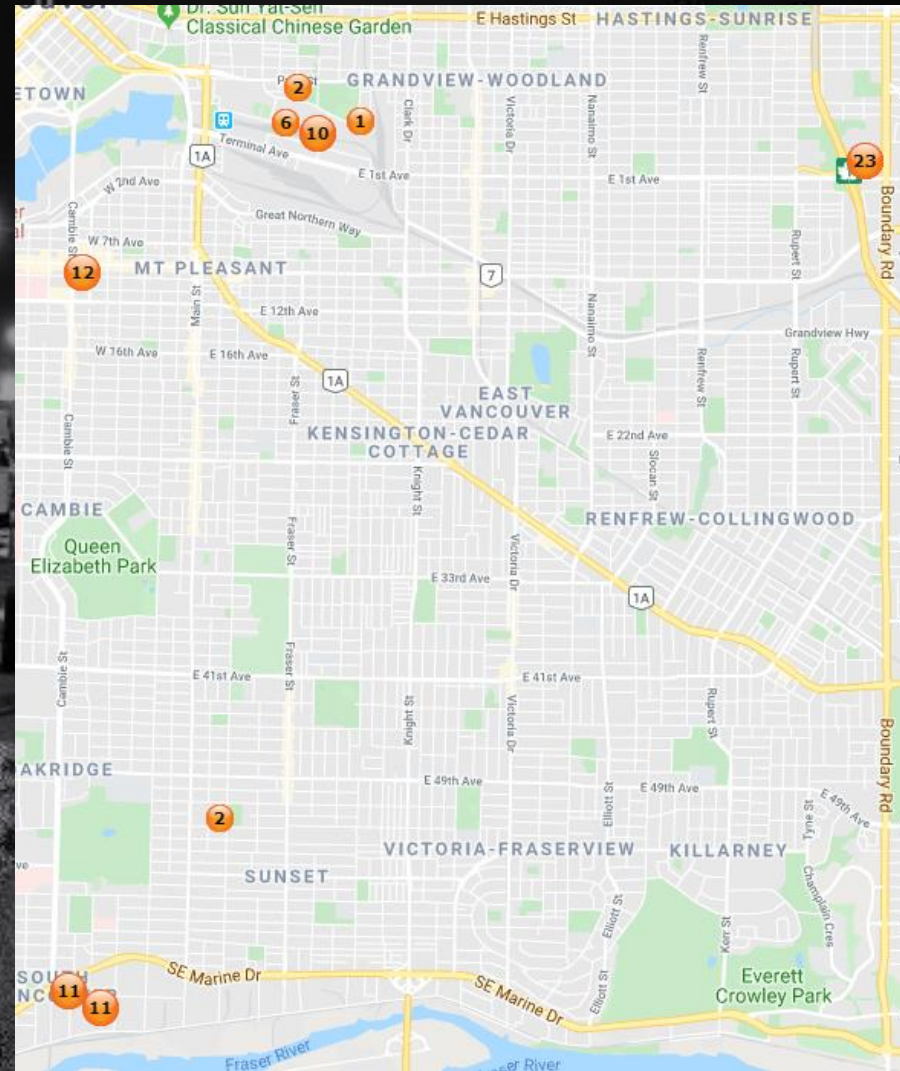
- **12** medium and heavy duty trucks
 - **2** cube vans
 - Vancouver Public Library book delivery
 - Garage support
 - **8** refuse trucks
 - 8-yard rear loaders
 - Abandoned garbage flat decks
 - Roll-off container trucks
 - **2** tractors trailers
 - Transfer refuse to Landfill
- **3** vendors
- **4** chassis models

Charging Infrastructure

EV Station projects managed by Fleet Strategy and Asset Management team.

“Depot charging” approach taken for first phase of electrification. Dedicated station installed with every vehicle replacement.

To date, 78 level 2 stations have been installed at 9 fleet sites



Charging Infrastructure

Approach to Medium/Heavy Duty EV Stations:

- Majority of trucks park at three major works yards:
 - Manitoba Yard
 - National Yard
 - Evans Yard
- These trucks require Level 3 charging stations
- AES Engineering hired to review existing electrical capacity to support large-scale electrification. Scope included necessary upgrades to support transition of majority of medium and heavy duty fleet to electric.
- Final report detailed high level design and costing for electrical charging infrastructure at each yard

Pilot Project - Infrastructure

Scope:

- **12** stations
 - **2** Level 2 (208 V) – Chargepoint CPF 25
 - **10** DC Level 3 (480 V) - TBD
- **4** sites
 - South Side Transfer Station
 - **2** DC Level 3
 - Manitoba Yard – Relay
 - **8** DC Level 3
 - Manitoba Yard – Garage
 - Central VPL Branch



QUESTIONS?

Evan Dacey

Head, Fleet Strategy and Asset
Management –

City of Vancouver

evan.dacey@vancouver.ca