



Gendarmerie royale du Canada
Royal Canadian Mounted Police

2024-10-31

Canada



NSS Fleet Business Management

Update: CIPMM Fleet Management 2024

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NSS Fleet Composition Trends

RCMP's National Safety and Security (NSS) Land Vehicle Inventory for fiscal year (FY) 2023-24 was **14,035** vehicles.

Vehicle Category	FY21-22	FY22-23	FY23-24	+/-
Passenger car	2124	1960	1624	500
Multi-purpose vehicle	6437	6650	7087	650
Van	1080	1055	1025	55
Pickup truck	2352	2367	2512	160
Truck	107	102	103	4
Bus	4	4	4	0
Other commercial medium and heavy duty vehicle	2	0	0	2
Motorcycle	73	77	78	5
Snowmobile	723	732	639	84
Off-road vehicles and other	893	908	815	78
Industrial equipment	171	128	97	74
Armoured Vehicles	61	53	51	10
Total	14027	14036	14035	8



New Light-Duty Vehicle Purchases

New LDV Purchases – NSS Fleet	FY 21-22	FY 22-23	FY 23-24	FY 24-25*
Hybrid Electric Vehicle (HEV)	91	184	317	286
Plug-In Hybrid Electric Vehicle (PHEV)	3	1	9	2
Battery Electric Vehicle (BEV)	2	2	32	5
Hydrogen/Fuel Cell Electric Vehicle (FCEV)	0	0	0	0
Combustion Engine (ICEV)	1377	1641	1534	419
Total	1473	1828	1892	712

Operational requirements, member safety, and home-base EVSE continue to guide our purchasing decisions to help reduce GHG emissions as we transition to ZEVs.

*Confirmed planned purchases as of 2024-10-22



Short term challenges

- Policy, Framework, and Guidance updates;
- Data integrity within the Fleet Management Information System (FMIS);
- Change management for the adoption of zero-emission vehicles (ZEV) for use in Federal Policing & National Policing Service;
- Replacing and modernizing the number of vehicles that are older than 10 years, including Special Purpose Vehicles (SPV);
- Market availability of ZEVs in the following segments:
 - L71 – Full Size Sport Utility (SUV)
 - L81 - Full Size SUV – PPV/SSV
 - L01 – Personnel Carriers, XL SUV



Short Term Goals

- Refresh the RCMP Transportation Management Manual (TMM) and Strategic Fleet Management Framework to align with present federal government policies and strategies;
- Coordinating the investment and installation of 500 telematics devices in front-line policing vehicles across Canada;
- Standard Operating Procedure (SOP) improvements to automate, reduce, or eliminate data entry that was previously performed manually;
- Cumulative purchase of 1,000 zero-emission light-duty vehicles for use in the National Safety & Security (NSS) fleet by FY 26/27;
- Leveraging GoC Tools and approved software to improve communication and dissemination of information within the RCMP fleet community;



Choosing the Right Vehicle

- Characteristics for the right EV policing vehicle
 - Range
 - Size
 - Ease of use/simplicity of operations
 - Police specific models over retail
 - Availability of policing equipment
 - Drive train



Our Pilot Vehicles

- Limited availability at time of purchase – restricted to GMVOG
 - Ford Mustang Mach-E – standard range, rear wheel drive
 - Ford Lightning – work truck, standard range, all wheel drive
 - Tesla Model Y – Dual Motor, Long Range



Upfitting an EV to a Police Vehicle

- Three options for upfit evaluated:
 - Third Party Vendor built the two Tesla's
 - Ford OEM up-fitter built the two Lightnings
 - Government partner built the two Mach-E's
- We did look at what each option could provide us in terms of innovation in order to set us up for future internal builds



Challenges

- Differences in driver experiences and the electrical systems: EV vs ICE
- Installation of policing equipment on redundant circuitry
- Charging infrastructure
- Change management – police officers don't like change



Technology Integrations

- Why use a laptop when the car comes with a giant screen?
- Why use a separate In-Car Video System when the vehicle has many?
- Why install police radar sets when the vehicles have radar?

Driving Safety Features and Policing

- Lane keep, follow to close, forward collision assist
 - Automatic braking, automatic steering

Today

Victoria, British Columbia – West Shore Detachment

- Model Y in service since February 2023
- Mach-E and Lightning into service mid October 2024



Future

- Tesla has proved to be very well received by officers and the public
 - Will we build more?
- Mach-E is affordable and looks sharp
 - Was difficult to equip with all policing equipment due to size
- Lightning – most similar to existing ICE vehicle in the fleet
 - Chosen to pilot in every province come 2025



Future

- Chevrolet Blazer EV
 - First EV built and marketed to police for police



Fleet Modernization Initiative

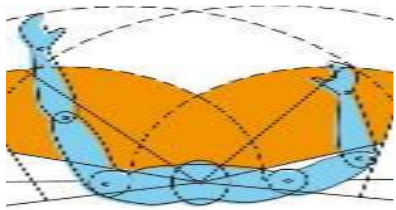


- ✓ Evidence based decision making in consultation with internal and external stakeholders and subject matter experts.
- ✓ Scientific modeling of suitability, opportunities and barriers to greening the fleet.
- ✓ Real world ZEV pilots
- ✓ Learning lessons from previous environmental policy and its impact on policing.



Determining ZEV suitability for RCMP operations

ERGONOMICS



POLICING EQUIPMENT



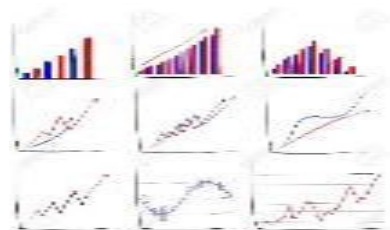
CYBER-SECURITY



REFUELLING



FINANCIAL AND OPERATIONAL SUITABILITY ANALYSIS



AWARENESS



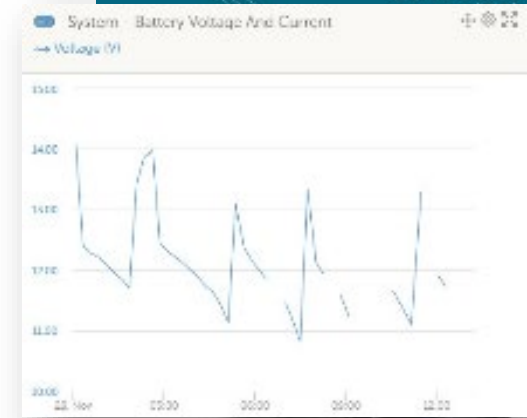
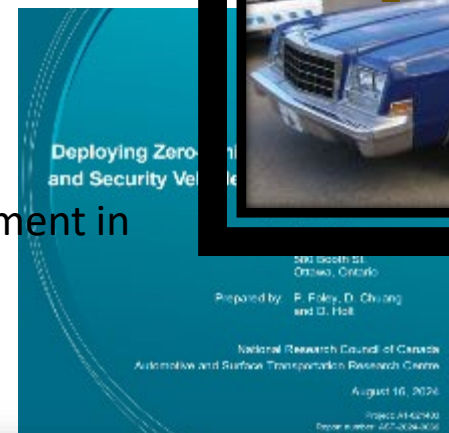
- The research done by RCMP included energy modeling of ZEV performance against a large sample of ICEV drive-cycles collected using telematics devices installed in 90 vehicles across Canada including:
 - developing vehicle models
 - parameterization of the model
 - climatic testing
 - model results
 - a study of energy usage range remaining.

By applying model results to the RCMP processed telematics dataset, demand rates were then applied to the drive-cycles to estimate the amount of driving range remaining in kilometres.

This remaining range was used to study the **potential for the introduction of ZEV vehicles into RCMP operations, through variation between locations and sensitivity to a number of factors. Roughly, 70% of drive-cycles were expected to have at least 100 km of range remaining at the end.**

RCMP FMI Supporting Studies and Guidance

- Pathway to 2030 (completed in 2022)
 - Analysis of past vehicle orders
 - RCMP specific vehicle market availability analysis
- RCMP Needs Assessment (2023-24)
 - Laboratory testing for the feasibility of the installation of policing equipment in ZEVs
 - Laboratory testing of the performance of ZEVs in a policing context
 - Hot and cold idling with policing equipment functional
 - Telematics data driven suitability study of ZEVs in real world policing
 - Deployment of pilot ZEVs in operational duty
- Dunsky vehicle fleet planning tool (completed in 2024)
- TPOF EVRA
- Novel and Provisional ZEV Charging Solutions Market Scan
- EVSE Bulletin
- Techno economic analysis (coming end of 2024-25)
- Enhanced cold weather condition testing



Test Results

- Tested up to 400w load (= to having all policing equipment on) with HV battery at 100%
 - Tested at 100 watt (1 hour), 200 watt (1 hour), 300 watt (1 hour and 400 watt (8 hours) loads to ensure safe operation
- Monitored HV and 12v auxiliary systems

HVAC Draw TESTING – with heat on at max

- ✓ Tested up to 400w load
- ✓ With 400w load for 6 hours HV battery capacity reduced from 100% to 62% With 400w load the 12v system voltage reduced to 13.92v and remained steady.
- ✓ No warning from monitoring systems

STARTING HV BATTERY AT 35%

- ✓ With 400w load for 4.5 hours HV battery capacity reduced from 35% to 3%
- ✓ With 400w load for 8 hours the 12v system voltage reduced to 13.91v and remained steady.
- ✓ No warning from monitoring systems

HVAC Draw TESTING – with AC on at Max

- ✓ With 400w load for 8 hours, HV batter capacity reduced to 79% from 100%.
- ✓ With 400w load for 8 hours the 12v system voltage reduced to 13.92v and remained steady.
- ✓ No warning from monitoring systems



Impactful findings

- Will Range be impacted by policing equipment
 - Measurements were performed for various operating load levels of the equipment and transient operating equipment. The results indicated that when the upfit equipment is utilized with the EV battery, the runtime is orders of magnitude greater than an ICEV vehicle, in the hundreds of hours and the equipment has negligible impact on the battery. Thus, this simple assessment suggests that EV range will be minimally impacted by the draw of the upfit equipment.

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Test Results

Core Control Head 21 & Slide Setting	NRC MEASURED CURRENT (ADC)	Power (Watts)	Optima Runtime (hrs)	ZEV Runtime (hrs)
Level 0	4.1	58	12.2	1493
Level 1	7.4	104	6.8	844
Level 2	13.6	191	3.7	460
Level 3	14.8	208	3.4	422

EVs and fires

- research from National Highway Traffic Safety Administration and the National Traffic Safety Board showed that fires in EVs happen at a rate of 25 for every 100,000 vehicles and for ICEVs the rate is 1,530 for every 100,000.
- <https://ici.radio-canada.ca/ohdio/premiere/emissions/moteur-de-recherche/episodes/786259/rattrapage-jeudi-16-novembre-2023>
- Rattrapage du 16 nov. 2023 : L'histoire de l'écriture, et les possibles dangers des batteries de voitures électriques
- Première | Moteur de recherche | Accédez au rattrapage et découvrez les musiques diffusées ainsi que les références de l'émission
- <https://www.idtechex.com/en/research-article/ev-fires-less-common-but-more-problematic/25749>

EVSE and EV Safety

- US trade association's [main webpage](#) on the topic of EVs/EVSE and fire safety.
- [National Highway Traffic Safety Administration \(NHTSA\)](#)
 - does not believe that electric vehicles present a greater risk of post-crash fire than gasoline powered vehicles.
- [Safety First: Practices, Policies, and Requirements in the EV Sector.](#)
 - In reality, driving an EV is just as safe as driving any other vehicle¹. ZETA's member companies— leaders in design, manufacturing, and innovation—make sure of that. So do state and federal regulations, independent third-party safety standards, and rigorous testing requirements.
 - EVs and internal combustion engine (ICE) vehicles must meet the same Federal Motor Vehicle Safety Standards (FMVSS)², and EVs must undergo a distinct, rigorous, and well-established testing process —including a separate one for batteries—before they are placed in service. As a result, EVs often contain more safety features than ICE cars: not only are they equipped with all traditional safety features, but they also include unique technologies designed to neutralize the car's electrical system in the event of a collision or short-circuit. The Insurance Institute for Highway Safety (IIHS) regularly selects EVs as some of the safest cars on the road, and this year identified several EVs.³
- <https://www.consumerreports.org/cars/car-safety/electric-cars-prove-safe-in-iihs-crash-tests-and-insurance-claims-a2640558822/>
- <https://www.govinfo.gov/content/pkg/CFR-2017-title49-vol6/xml/CFR-2017-title49-vol6-part571.xml>
- <https://www.iihs.org/ratings/top-safety-picks?tspPlusOnly#award-winners>

Infrastructure

- Ownership
 - RCMP, PSPC lease, Lease, Provincial partnerships, Municipality
- Currently, 27 charge points operational for EVs at 7 different sites
 - Infrastructure (conduit) to support 18 additional charge points
 - Regions reports plans to install infra for 63 additional charge points in the next 2 FYs

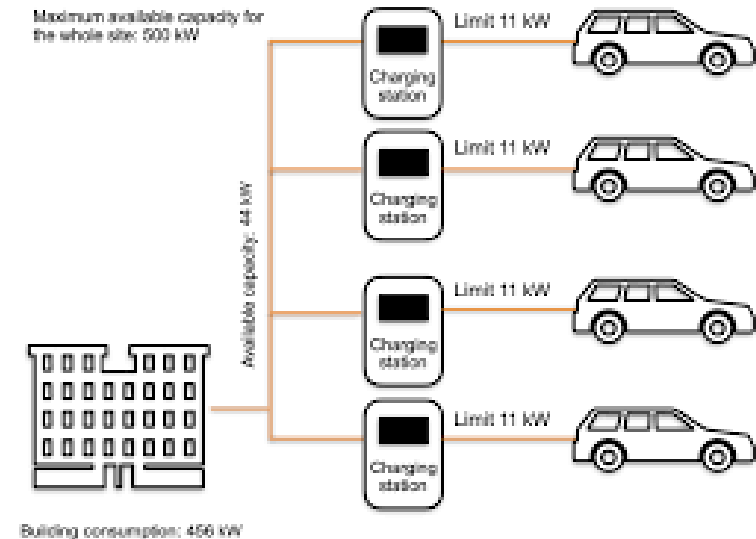


EV Infrastructure – Chargers

Options	Level 1	Level 2	Level 3 (fast charger)
Input	120 V	208/240 V	480 V
Outlet Type	Standard electrical outlet (for example, phone charger)	Special electrical outlet (for example, stove or dryer plug)	DC outlet (not found in homes)
Time to Charge	8-50 hours	4-10 hours	25-30 minutes
Typical Applications	Home charging and back-up situations	Home charging, charging at businesses and public spaces	Charging at dedicated stations, public spaces, and highway corridors

EV Infrastructure - Chargers

- Identifying types of chargers – beyond identifying the levels
- Smart vs. Dummy chargers
- Monitoring
 - Cloud based or energy based
 - Reporting
- Load Balancing/Management
 - Multiple chargers
 - Different requirements



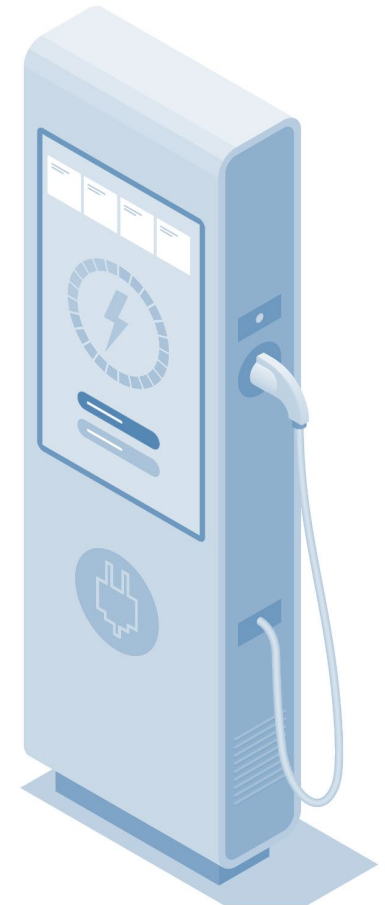
EV Infrastructure for RCMP Building

- EVSE Bulletin for Real Property
 - For all new construction, major renovations and parking lot and exterior upgrades EV infrastructure must be installed at minimum.
 - Install min. one (1) charger with at least one (1) charge point per location, preferably two (2).
 - Infra. for EVSE includes the install of conduit for future EVs
- Cooperation between Real Property & Fleet for site specific needs.



EV Infra Planning & Considerations

- Planning considerations:
 - Location - Urban/Suburban/Rural/Remote/Isolated
 - Local utility limitations;
 - Available amperage: Site & Building
 - Security (Both site and IT) ; and
 - The use of public infrastructure for charging.
- Post Garages
- Fleet storage locations – lvl.1 charger
- Restricted use



EV Infrastructure Requirements

- Level II Charging – 30A-80A based on needs assessment.
- Rough-ins
 - Identify Parking Spaces
 - Elec. Sub-Panels
 - Energy Monitoring
 - Conduit from building to parking lot
- Security Considerations
 - Lighting
 - Curbs/Bollards
 - Access Control
- No installation of EVs on back-up generators



Next Steps

- Develop a national mapping tool;
- Develop requirements for targeted locations;
- Gathering vehicle telematics (EV and ICE)
- Regions
 - Assess all major capital project for EV incorporation
 - Consider Electrical Vehicle Readiness Assessment (EVRA's) for existing facilities



Additional Resources and References

- [Treasury Board of Canada Secretariat – Greening Government Strategy Webpage. Updated: 2023-09-05](#)
- [Natural Resources Canada – Electric Vehicle Charging Webpage. Updated: 2023-12-07](#)
- [Natural Resources Canada – Electric Charging and Alternative Fuelling Station Locator Web Tool. Updated: 2023-08-10](#)

Questions?



Presentation

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