

Pilot Green Transport Fund

Interim Report

On

Trial of Electric Light Goods Vehicle for Renovation

Service

(Laser Cutting Company Limited)

(27 July 2021)

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The Monitoring and Evaluation Team's views expressed in this report do not necessarily reflect the views of the Environmental Protection Department, HKSAR.

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**Pilot Green Transport Fund
Trial of Electric Light Goods Vehicle for Renovation Service
(Laser Cutting Company Limited)**

**Interim Report
(Reporting Period: 1 June 2020 – 31 May 2021)**

Executive Summary

1. Introduction

1.1 The Pilot Green Transport Fund (the Fund) is set up to encourage transport operators to try out green innovative transport technologies, contributing to better air quality and public health for Hong Kong. Laser Cutting Company Limited (Laser Cutting) was approved under the Fund for trial of one electric light goods vehicle for renovation service. Laser Cutting, through the tendering procedures stipulated in the Agreement entered into with the Government, procured a Nissan e-NV200 electric light goods vehicle (EV) for trial. According to the manufacturer, the EV has a travel range of 317 km with its battery fully charged and air-conditioning off.

1.2 PolyU Technology and Consultancy Company Limited has been engaged by the Environmental Protection Department as an independent third party assessor to monitor the trial and evaluate the performance of the trial vehicle. Laser Cutting assigned a Mercedes Benz diesel light goods vehicle (DV) providing the same service as the conventional counterpart for comparing with the EV.

1.3 This Interim Report summarizes the performance of the EV in the first twelve months of the trial as compared with its conventional counterpart, i.e. the DV.

2. Trial and Conventional Vehicles

2.1 Key features of the EV, the charging facility and the DV are in Appendix 1 and their photos are in Appendix 2. The EV was used for the delivery of goods for metal work from Tai Po to Kowloon.

2.2 Laser Cutting installed a 7 kW AC charging facility inside Riverain Bayside in Tai Po for charging the EV and recording the amount of electricity charged. The EV was not charged every day, and was charged when it was not in use.

3. Trial Information

3.1 The trial commenced on 1 June 2020 and would last for 24 months. Laser Cutting was required to collect and provide trial information including the EV's mileage reading before charging, amount of electricity consumed and time used in each charging, and operation downtime due to charging, cost and downtime associated with scheduled and unscheduled maintenances of the EV and the charging facility. Similar data of the DV were also required. In addition to the cost information, reports on maintenance work, operational difficulties and opinions of the driver and Laser Cutting were collected to reflect any problems of the EV.

4. Findings of Trial

4.1 The following table summarizes the statistical data of the EV and the DV. The average fuel cost of the EV was HK\$1.09/km (82%) lower than that of the DV. The average total operating cost of the EV was HK\$1.56/km (79%) lower than that of the DV.

Table 1: Key operation statistics of each vehicle (June 2020 – May 2021)

	EV	DV
Total mileage (km)	10,341	5,879
Average daily mileage (km/working day)	42	24
Average fuel economy	(km/kWh)	5.02
	(km/litre)	-
	(km/MJ)	0.31 ^[1]
Average fuel cost (HK\$/km)	0.24 ^[2]	1.33 ^[3]
Average total operating cost (HK\$/km) [4]	0.42	1.98
Downtime (working day) ^{[4] [5]}	2	1

^[1] Assuming lower heating value of 36.13 MJ/litre for diesel fuel

^[2] Electricity cost was based on HK\$1.218/kWh

^[3] The market fuel price was used for calculation

^[4] Maintenance not related to performance of vehicle was not included in the comparison.

^[5] Downtime refers to the number of working days in which the vehicle is not in operation due to maintenance, counting from the first day it stops operation till the day it is returned to the operator.

4.2 Apart from the fuel cost, maintenance cost and other indirect costs which may include parking fee, towing fee, vehicle replacement fee, etc., are also included in Table 1.

In the first twelve months of the trial, the EV had two scheduled maintenances but no unscheduled maintenance, whilst the DV had one scheduled and one unscheduled maintenances.

4.3 The EV had 2 days of downtime for maintenance while the DV had 1 day of downtime for maintenance. The utilization rates were 99.2% for the EV and 99.6% for the DV. The charging facility also had an unscheduled maintenance in which a switch was replaced, but it did not cause any downtime for the EV. Based on the above, the average daily mileages of the EV and the DV were 42 km/day and 24 km/day respectively. There was no indication on the deterioration of the EV performance in this trial period.

4.4 The driver of the EV had no problem in operating the EV. However, he did not consider that the power of the EV was as good as the DV on uphill driving. Laser Cutting agreed that using the EV is good because it can provide a greener, quieter environment and has a lower fuel cost. Laser Cutting would encourage other transport operators to try out electric light goods vehicles and would consider replacing the existing diesel light goods vehicle(s) with them.

5. Summary

5.1 The average fuel cost of the EV was HK\$1.09/km (82%) less than that of the DV. The average total operating cost of the EV was HK\$1.56/km (79%) lower than that of the DV. The utilization rates were 99.2% for the EV and 99.6% for the DV. In the first twelve months of the trial, there was no indication on the deterioration of the EV performance.

5.2 Both the driver and Laser Cutting were satisfied with the performance of the EV. The driver had no problem in operating the EV, but did not consider that the power of the EV was as good as the DV on uphill driving. Laser Cutting considered that the EV could provide a greener, quieter environment and has a lower fuel cost.

5.3 The findings only reflect the performance of the EV in the first twelve months of the trial. The performance and reliability of the EV will be continuously monitored in the 24 months of the trial.

Appendix 1: Key Features of the Vehicles and Charging Facility

1. Trial EV and Charging Facility

(a) EV

Registration mark	WR8881
Make:	Nissan
Model:	e-NV200
Class:	Light goods vehicle
Gross vehicle weight:	2,250 kg
Seating capacity:	Driver + 4 passengers
Rated power:	80 kW
Travel range:	317 km (air conditioning off)
Battery material:	lithium-ion
Battery capacity:	40 kWh
Year of manufacture:	2019

(b) Charging Facility

Supplier:	Shun Hing Electric Service Centre Limited
Model:	DH-AC0070XG57-Y
Power:	7 kW, single phase, 220V AC, 32A
Charging standard:	GB

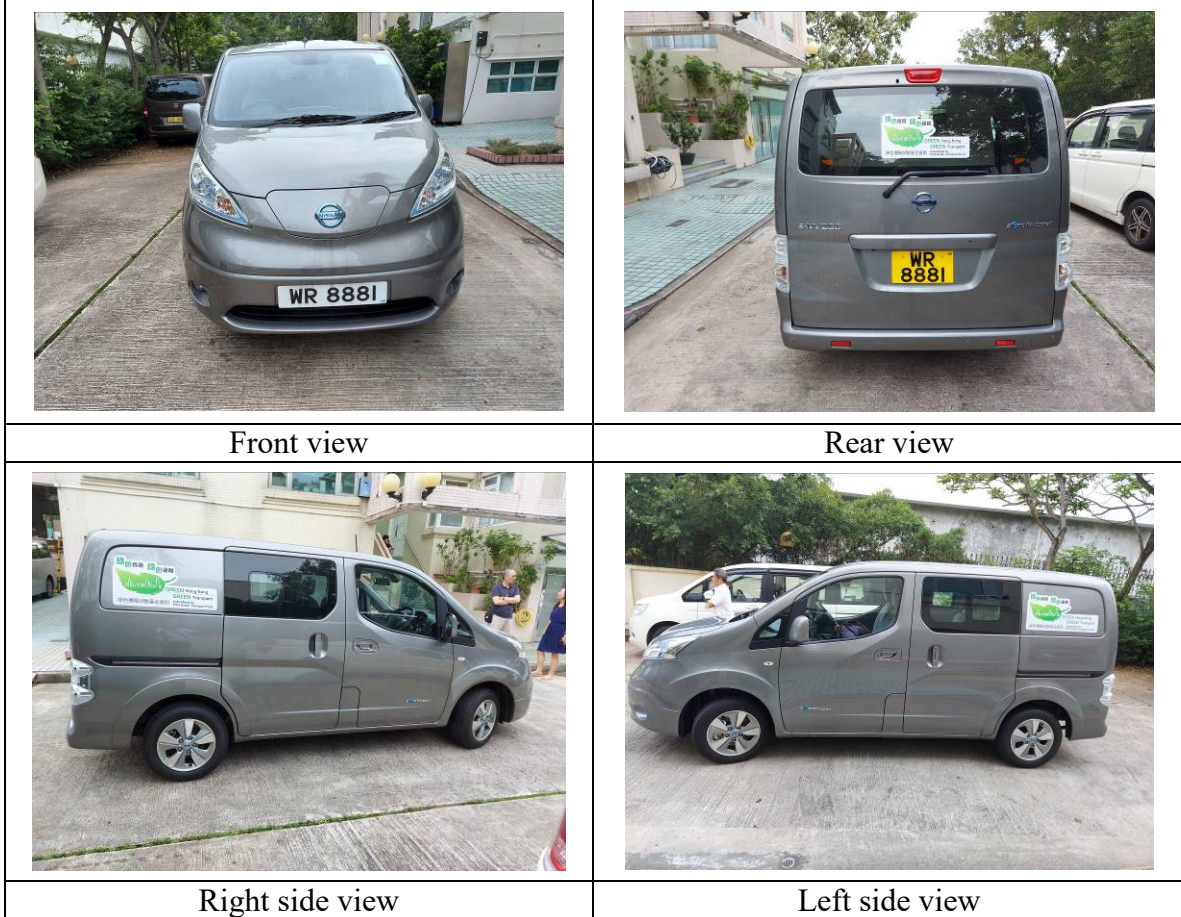
2. DV for Comparison

Registration mark	UZ3032
Make:	Mercedes Benz
Model:	116BT
Class:	Light goods vehicle
Seating capacity:	Driver + 5 passengers
Gross vehicle weight:	3,050 kg
Cylinder capacity:	2,143 c.c.
Year of manufacture:	2017

Appendix 2: Photos of Vehicles and Charging Facility

1. Trial EV and Charging Facility

(a) Trial EV



(b) Charging Facility



2. DV for Comparison



Front view



Rear view