Pilot Green Transport Fund

Interim Report
On
Trial of Electric Light Goods Vehicle for Retail and Wholesale Industry
(Garment Express Limited)

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Interim Report
(Trial Period: 1 April 2020 – 31 March 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. Garment Express Limited (Garment Express) was approved under the Fund for trial of one electric light goods vehicle for providing garment delivery services in the territory. Through the tendering procedure stipulated in the Subsidy Agreement entered into with the Government, Garment Express procured a NISSAN e-NV200 electric light goods vehicle (EV) for trial

1.2 PolyU Technology and Consultancy Company Limited (PTeC) has been engaged by the Environmental Protection Department (EPD) as an independent third party assessor to monitor the trial and evaluate the performance of the trial vehicle. Garment Express assigned a Tokyo HIACE diesel light goods vehicle (DV) which provided the same type of services, 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 DV are in Appendix 1 and their photos are provided in Appendix 2. The vehicles were used for garment delivery services. According to the EV's manufacturer, the EV's gross vehicle weight is 2,250 kg and it has a driving range of 317 km (air conditioning off).

2.2 Garment Express has set up one dedicated 13 Ampere single-phase charging facility at its own cost at its premises in Yau Yat Chuen to charge the EV outside office hours at night.

3. Trial Information

3.1 The trial started on 1 April 2020 and would last for 24 months. Garment Express was required to collect and provide trial information including the EV mileage reading before charging, amount of electricity consumed in each charging, time taken for charging, operation downtime due to charging, cost and downtime associated with scheduled and unscheduled maintenances of the EV and the charging facility. A similar set of data from the DV was also required. In addition to the cost information, reports on maintenance work, operational difficulties and opinions of the driver and Garment Express were collected and provided to reflect any problems of the EV.

4. Findings of Trial

4.1 Table 1 summarizes the statistical data of the EV and DV.

Table 1: Key operation statistics of each vehicle (1 April 2020 – 31 March 2021)

		EV	**DV**
Total distance travelled (km)		22,534	55,481
Average daily distance traveled (km/day)		77	189
Average fuel economy	(km/kWh)	4.77	-
	(km/litre)	-	9.94
	(km/MJ)	1.32	0.28[1]
Average fuel cost (HK$/km)[2]		0.26	1.47
Average total operating cost (HK$/km) [3]		0.36	1.54
Downtime (working day) [3] [4]		2.5	3.0

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

[2] The market fuel price was used for calculation

[3] Maintenance due to incident not related to the performance of the vehicle was not included for comparing the performance.

[4] Downtime refers to the equivalent 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 The average fuel cost of EV was HK$1.21/km (82%) lower than that of the DV. There were three scheduled maintenances for both EV and DV, but no unscheduled maintenance was incurred for both vehicles. The saving in average total operating costs of the EV over DV was HK$1.18/km (77%).

4.3 During this reporting period, the EV and DV both had three scheduled maintenances but no unscheduled maintenance, causing 2.5 and 3.0 days downtime respectively. The utilization rates of EV and DV were both 99%. In the first 12 months of the trial, there was no indication on the deterioration of the EV's performance.

5. Summary

5.1 In the first twelve months of the trial, the average daily mileage of the EV was 77 km, while that of the DV was 189 km. The average fuel cost and the average total operating cost of the EV was HK$1.21/km (82%) and HK$1.18/km (77%) respectively lower than those of the DV. The utilization rates of the EV and the DV were both 99%.

5.2 The EV driver had no problem in operating the EV and felt the EV was quieter and more environmentally friendly compared to the DV. The battery capacity was adequate to support the daily operation. Garment Express was satisfied with the performance of the EV and did not find any deterioration of the performance of the EV.

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 Vehicles and Charging Facility

1. Trial EV and Charging Facility

(a) Trial EV

Registration Mark:	**JW2468**
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 type	Lithium-ion
Battery capacity:	40 kWh
Year of manufacture:	2019

(b) Charging Facility

Charging standard:	220V standard socket
Charging code:	13Amp, single-phase

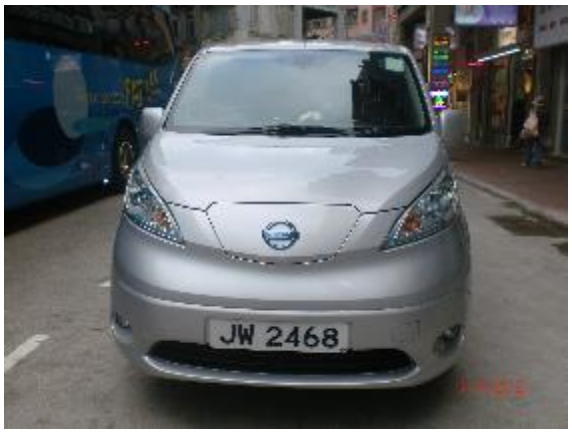
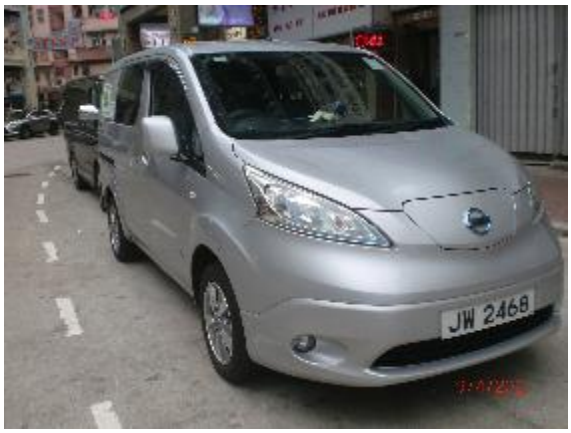
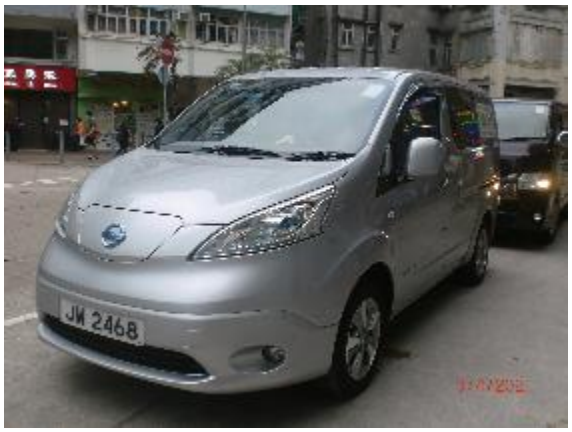
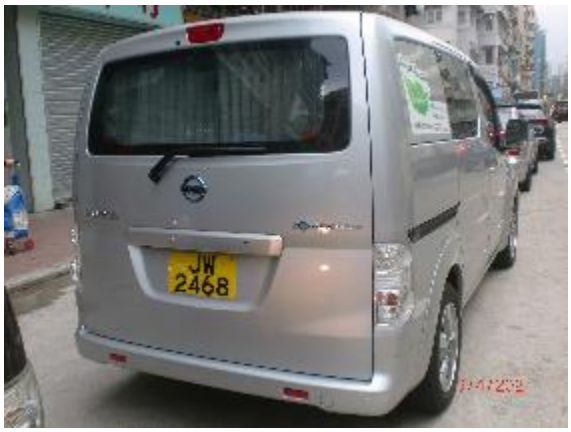
2. DV used for comparison

Registration Mark:	**UK7785**
Make:	TOYOTA
Model:	HIACE DIESEL LWB
Class:	Light goods vehicle
Gross vehicle weight:	2,800 kg
Seating capacity:	driver + 5 passengers
Cylinder capacity:	2,982 cc
Year of manufacture:	2016

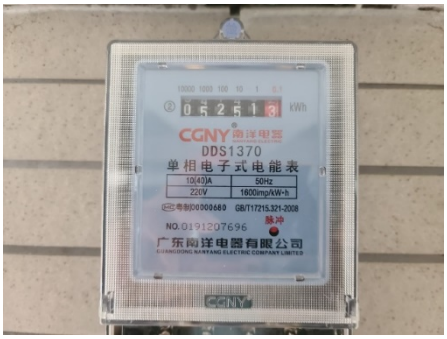
Appendix 2: Photos of Vehicles and Charging Facility

1. Trial EV and Charging Facility

(a) Trial EV (JW2468)

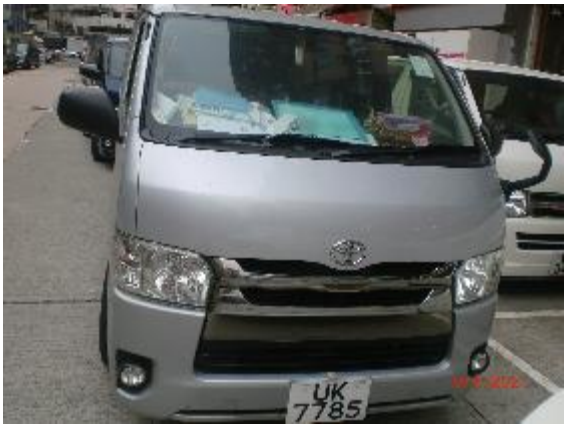
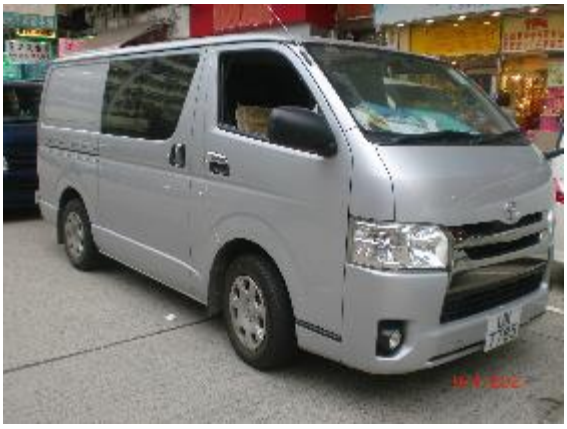
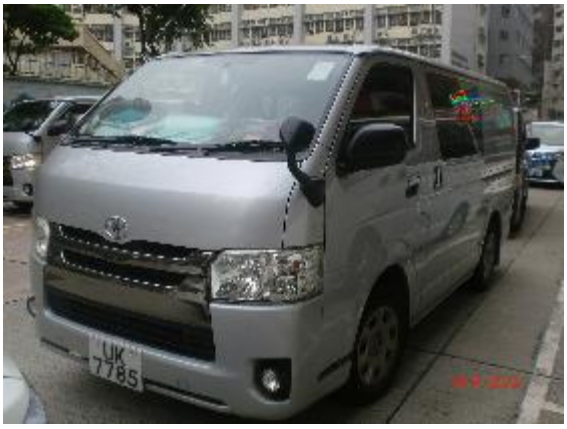
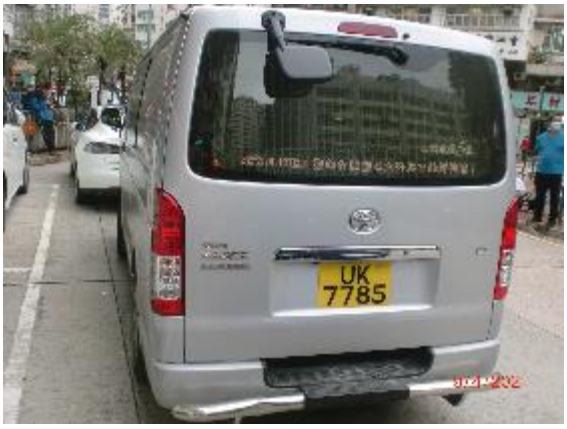
	
Front view of EV	Right side view of EV
	
Left side view of EV	Rear view of EV

(b) Charging Facility

	
Single phase 13A charging facility	Dedicated power meter

2. DV used for comparison

DV (UK7785)

	
Front view of DV	Right side view of DV
	
Left side view of DV	Rear view of DV