Pilot Green Transport Fund

Interim Report
On
Trial of Hybrid Medium Goods Vehicle for Courier Service (DHL)

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(Trial Period: 1 June 2016 – 30 November 2016)

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. The Fund has subsidized DHL Express (Hong Kong) Limited (DHL) to try out one hybrid medium goods vehicle (HV) for delivery service.

1.2 PolyU Technology and Consultancy Company Limited (the assessor) has been engaged by the Environmental Protection Department (EPD) as an independent third party assessor to monitor the trials and evaluate the operational performance of the trial vehicles. The assessor regularly visited DHL to collect information for evaluating the performance of the HV as compared with the diesel medium goods vehicle (DV) which provided the same service in the same areas and road conditions. The information collected includes the said vehicles' operation data, fuel bills, maintenance records, reports on operation difficulties, and opinions of the HV drivers from survey questionnaires.

1.3 This Interim Report summarizes the performance of the HV for courier service in the first six months of the trial as compared with their conventional counterpart, i.e. the DV.

2. Trial Vehicles

2.1 DHL procured one Mitsubishi FUSO HV of 7.5tonnes gross vehicle weight (GVW) of 2998 cc cylinder capacity for trial. One Mitsubishi FUSO DV of 9.0tonnes GVW and 2998 cc cyliner capacity was assigned for comparison with the HV. Both vehicles were equipped with air-conditioning.

2.2 Key features and photos of the HV and DV are in Appendix 1 and Appendix 2 respectively.

3. Trial Information

3.1 The 24-month trial started on 1 June 2016 and will last for 24 months. Both the HV and DV operated from Cheung Sha Wan Depot. The HV delivered posted packages in Shatin areas while the DV delivered pasted packages in Tsuen Wan areas. There was no fixed route. The vehicles provided service every day from Monday to Saturday (8:00 am – 6:30 pm) excluding Sundays and public holidays.

4. Findings of Trial

4.1 During this six-month report period, the HV travelled 8,476 km whereas the DV travelled 6,846 km. The performance of the HV and its average operating costs as compared with the DV in the first six months of the trial is summarized below:

Table 1: Average fuel economy and average fuel cost of trial vehicles

	HV	**DV**
Average fuel economy, km/litre	6.25	5.46
Average fuel cost[1] HK$/km	1.77	2.02
Average total operating cost[1],[2] HK$/km	1.87	2.41

[1] The market fuel price was used for calculation
[2] Including costs incurred from maintenance. DHL did not pay for the labour cost of the maintenance of the HV because the vehicle was under warranty.

4.2 The average fuel cost of the HV (HK$1.77/km) was lower than its conventional counterpart (HK$2.02/km) by 12.6%. The vehicles' operating conditions and the drivers' driving habit would affect its fuel saving performance.

4.3 In addition to fuel costs, maintenance cost and other costs associated with breakdowns, such as replacement of components and parts, were also accounted for in calculating the total operating cost. It should be noted that the maintenance cost of the HV did not include labour cost as the vehicles were still under warranty, the labour cost was waived and only the parts to be replaced were charged. The total operating cost of the HV was 22.2% lower than the DV.

4.4 During the report period, the HV had undergone one scheduled maintenance and three unscheduled maintenance. For the scheduled maintenance, the HV lost three (3) working days. For the unscheduled maintenances HV lost seven (7) working days to replace the door lock of the cargo box and repaired control box and door. These unscheduled maintenance actions were however unrelated to the performance of the HV and thus not included for comparing the performance of the vehicles. There was one scheduled maintenance action for the DV. It had a thorough check-up, resulting in strengthening the body and chassis mounting. It lost eight (8) working days. DV had three unscheduled maintenance actions; it involved reset data, water level switch defects as well as installing the tail lift platform control to meet the prevailing safety standard. DV lost eight (8) working days. However, the tail lift control was unrelated to its performance. The utilization rate of the HV was 98% (excluding the downtime unrelated to its performance), and the DV was 93%.

5. Summary

5.1 The vehicle operating conditions and the drivers' driving habit would affect the fuel saving performance of the hybrid vehicles. The HV had an average of 12.6% saving in fuel cost per kilometer travelled as compared to the DV. In general, the HV had better fuel economy than DV with the six months data.

5.2 The HV driver reflected that they had no problem to operate the vehicle. He in general felt the HV was clean and less polluted. However, he reflected that HV rolled back on uphill start. He had to use hand brake to perform the uphill start. He also had to adjust the gear from third to second gear at start on flat.

5.3 The HV had one scheduled maintenance and three unscheduled maintenance in the six-month trial period but the unscheduled maintenance was unrelated to the performance of the HV. Therefore, the HV had 98% (excluding those down time unrelated to its performance) utilization rate, which was better than the DV.

5.4 No deterioration in the performance of the HV was observed from the six months reported data.

5.5 The findings only reflect the performance of the HV in the first six months of the trial. More time is needed to test the performance and reliability of the HV.

Appendix 1: Key Features of Vehicles

1. Trial HV

Registration Mark:	**UB1641 (HV)**
Make:	MITSUBISHI FUSO
Model:	FEB74GR3SDAP
Class:	Medium goods vehicle
Gross vehicle weight:	7500 kg
Seating Capacity:	3 passengers (including driver)
Cylinder capacity:	2998 cc
Year of manufacture:	2015

2. DV used for comparison

Registration Mark:	**RD3436 (DV)**
Make:	MITSUBISHI FUSO
Model:	FEC91GR3SDAD
Class:	Medium goods vehicle
Gross vehicle weight:	9000 kg
Seating Capacity:	3 passengers (including driver)
Cylinder capacity:	2998 cc
Year of manufacture:	2011

Appendix 2: Photos of the Vehicles

1. Trial HV

	
Front view of HV (UB1641)	Side view of HV
	
Side view of HV	Rear view of HV

2. DV used for comparison

	
Front view of DV (RD3436)	Side view of DV