Pilot Green Transport Fund

Interim Report On
Trial of Single-deck Hybrid Bus for
Coach Rental Service
(Wah Kwok Transportation Company Limited)

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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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Interim Report
(Trial Period: 1 February 2018 – 31 January 2019)

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. Wah Kwok Transportation Company Limited (Wah Kwok) was approved under the Fund for trial of one single-deck hybrid bus (hereafter called HV) for coach rental service. Through the tendering procedures stipulated in the Subsidy Agreement, Wah Kwok procured one SAIC single-deck hybrid bus for trial.

1.2 Hong Kong Institute of Vocational Education (Tsing Yi) 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. One single-deck diesel bus (DV) providing the same service was assigned as the conventional vehicle for comparing with the HV.

1.3 This Interim Report summarizes the performance of the HV in the first twelve months of the trial as compared with its conventional counterpart.

2. Trial Vehicles

2.1 The HV has a gross vehicle weight (GVW) of 17,500 kg and a seating capacity is 65 passengers. The DV has a GVW of 16,000 kg and a seating capacity of 65 passengers. Both the HV and the DV serve the same circular route between Hong Kong Garden and Tsuen Wan Station every day.

2.2 Key features of the HV and the DV are in Appendix 1 and photos of the vehicles are in Appendix 2. The vehicles were used for coach rental service.

3. Trial Information

3.1 The trial started on 1 February 2018 and would last for 24 months. Wah Kwok was required to collect and provide trial information including the HV odometer reading, the date of refueling, the refueled amount, cost and operation downtime associated with scheduled and unscheduled

maintenance of the HV. Similar data from the DV was also required. In addition to the cost information, reports on maintenance work, operational difficulties and opinions of the drivers were also collected to reflect any problems of the HV.

4. Findings of Trial

4.1 Table 1 summarizes the statistical data of the HV and the DV. The average fuel cost of the HV was HK$0.64/km (12.2%) lower than that of the DV and the average total operating cost of the HV was HK$0.72/km (13.5%) lower than that of the DV.

Table 1: Key Operation Statistics of Each Vehicle (February 2018 – January 2019)

		HV	**DV**
Total mileage	(km)	73,514	73,030
Average fuel economy	(km/litre)	2.93	2.57
Average fuel cost (HK$/km) [1]		4.61	5.25
Average total operating cost/ (HK$/km) [2]		4.63	5.35
Downtime/ working day [3]		7	4

[1] Market rate was adopted for calculation.

[2] Maintenance due to incidents unrelated to the performance of the vehicle was not included for comparison.

[3] Downtime refers to the equivalent number of working days in which the vehicle was not in operation due to maintenance, counting from the first day it stopped operation till the day it was returned to the operator.

4.2 During the first twelve months of the trial, the HV had two scheduled maintenances resulting in a downtime of 6 working days whilst there was one scheduled maintenance for the DV resulting in a downtime of 3 working days.

4.3 Also, the HV had one unscheduled maintenance resulting in a downtime of 1 working day. The DV had two unscheduled maintenances resulting in a downtime of 1 working day as one of them was not related to vehicle performance and excluded for comparison in this reporting period.

4.4 The utilization rates of the HV and the DV were 98.1% and 98.9% respectively.

5. Summary

5.1 During the first twelve months of the trial, the average daily mileage of the HV was 205 km, while that of the DV was 204 km. The HV incurred a lower fuel cost which was HK$0.64/km (12.2%) lower than that of the DV and the average total operating cost of the HV is HK$0.72/km (13.5%) lower than that of the DV. The utilization rates of the HV and the DV were 98.1% and 98.9% respectively.

5.2 The feedbacks from the passengers were in general on the positive side. They felt that the HV was quieter and the air was cleaner inside the HV. They liked the HV and supported on replacing the existing diesel vehicles by hybrid vehicles.

5.3 The HV driver shared the view that the HV could save fuel. The HV driver also expressed that although the HV had comparatively lower power and was noisy when climbing uphill, he has been accustomed to driving the HV.

5.4 Wah Kwok expressed that the HV could meet their operational requirements and helped save their operating costs. However, they had reservation on replacing all their existing conventional vehicles with hybrid vehicles at this stage.

5.5 In general, Wah Kwok and the driver were satisfied with the performance of the HV disregarding the comparatively lower power for climbing uphill.

5.6 The findings only reflect the performance of the HV in the first twelve 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	**FG9698**
Make:	SAIC
Model:	SK6110H
Class:	Single deck public bus
Gross vehicle weight:	17,500 kg
Seating capacity:	Driver + 65 passengers
Cylinder capacity:	6,692 c.c.
Maximum Output (ps/rpm):	245/2,300
Battery Type:	Lithium Manganese Oxide battery
Year of manufacture:	2016

2. DV for comparison

Registration Mark	**DD3331**
Make:	Volvo
Model:	B7R MKIII EEV
Class:	Single deck public bus
Gross vehicle weight:	16,000 kg
Seating capacity:	Driver + 65 passengers
Cylinder capacity:	7,146 c.c.
Year of manufacture:	2014

Appendix 2: Photos of Vehicles

1. Trial HV

HV Front View	HV Rear View
HV Side View 1	HV Side View 2

2. DV for comparison

DV Front view	DV Rear view
DV Side view	DV Side view