

ITEM FOR FINANCE COMMITTEE

HEAD 44 – ENVIRONMENTAL PROTECTION DEPARTMENT

Subhead 700 General non-recurrent

New Item “Trial of Hybrid Buses by Franchised Bus Companies”

Members are invited to approve the creation of a new commitment of \$33 million for funding the full cost of procuring six hybrid buses for trial by the franchised bus companies in Hong Kong.

PROBLEM

Franchised buses are one of the major causes of roadside air pollution on busy corridors. We need to implement improvement measures to reduce emissions from franchised buses.

PROPOSAL

2. The Director of Environmental Protection, with the support of the Secretary for the Environment, proposes to create a new commitment of \$33 million to fund the full cost of procuring six hybrid buses to be used by the franchised bus companies for trial along busy corridors to assess their operational efficiency, emission performance and economic feasibility in local operational conditions.

3. Subject to the funding approval by the Finance Committee, we plan to work with the franchised bus companies to procure six hybrid buses in this year. Allowing one year for delivery, the trial could commence within 2012.

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JUSTIFICATION

Improvement to Roadside Air Quality

4. Franchised buses are one of the major causes of roadside air pollution on busy corridors such as those in Causeway Bay, Central and Mong Kok. Reducing emissions from franchised buses by deploying cleaner buses to run along these corridors could improve roadside air quality.

5. The Chief Executive announced in his Policy Address last October that the ultimate policy objective of the Government is to have zero emission buses running across the territory. When the current bus franchises expire in the coming few years, additional franchise requirements will be imposed on the bus companies to switch to zero emission buses or the most environmental-friendly buses when replacing existing ones, taking into account the feasibility and affordability for bus operators and passengers.

6. In terms of fuel consumption and other environmental performance, hybrid buses are superior to ordinary diesel buses. In view of market availability and technical developments, hybrid buses have the potential to replace diesel buses on a large scale within a short period of time. In many overseas cities such as New York and London, as well as in some Mainland cities such as Shanghai and Shenzhen, hybrid buses are being used in public transport. However, the operation mode of the buses in these cities is probably less intensive than that of Hong Kong, which is characterized by high operation frequency, hilly terrains and hot and humid summer that require significant air-conditioning capability. These stringent operational conditions will put hybrid buses, particularly their batteries, to very severe test.

7. To test the operational efficiency and performance of hybrid buses in Hong Kong conditions and to collect operational data, the Chief Executive proposed in his Policy Address to fund the full cost of procuring six hybrid buses for use by the franchised bus companies along busy corridors.

Environmental Benefits

8. Unlike a conventional diesel bus, the operation of a hybrid bus is aided by a motor (via a battery pack) on top of a diesel engine, which is usually smaller than that of a conventional bus. The battery pack is charged during the operation of the bus. Additional charging can be made through brake regeneration (i.e. capturing the braking power for charging the batteries). Therefore, hybrid buses have better fuel economy and emission performance than conventional diesel buses.

9. According to tests conducted by a major bus manufacturer, the environmental benefits of hybrid buses over conventional diesel buses are as follows –

- (a) nitrogen oxides and particulates emissions reduced by about 40-50%; and
- (b) carbon dioxide emission and fuel consumption reduced by about 30%.

The Proposed Trial

10. Amongst the franchised bus companies in Hong Kong, only The Kowloon Motor Bus Company (1933) Limited (KMB), Citybus Limited (Citybus) and New World First Bus Services Limited (NWFB) operate routes that serve the busy corridors in Causeway Bay, Central and Mong Kok. The sizes of KMB and Citybus/NWFB bus fleets running in these corridors are roughly the same. We thus propose to allocate three hybrid buses each to KMB and Citybus/NWFB for trial.

11. The participating franchised bus companies will be required to operate the hybrid buses along routes running through the above three busy corridors. They will also be responsible for the recurrent costs arising from the operation of these buses. Since the Government will fund the full cost of procuring the hybrid buses and their number is small compared with the size of the franchised bus fleets, we do not expect the trial to have any implication on the bus fares.

12. The trial will last for two years to enable a comprehensive assessment of the operational efficiency and performance of the buses, in particular the durability and reliability of the batteries in the local conditions of hilly terrains and hot and humid summers. An interim review will be carried out about one year after the start of the trial to provide a preliminary assessment of the performance of the hybrid buses. The franchised bus companies will be required to continue to deploy the hybrid buses for providing franchised bus service until the end of their economical service life or until they reach the age of 18 years.

13. Upon expiry of the current bus franchises, additional franchise requirements will be imposed on the bus companies to switch to zero emission buses or the most environmental-friendly buses when replacing existing ones, taking into account the feasibility and affordability for bus operators and passengers. If the trial is successful, hybrid buses can be one of the environmental-friendly bus types to be considered by bus companies for replacing existing ones in accordance with the new franchise terms so imposed.

14. To expedite preparation for the trial, we are already in discussion with KMB and Citybus/NWFB on the details of the trial arrangements with a view to reaching agreement with them. In parallel, the franchised bus companies are also preparing the technical specifications for acquiring the six hybrid buses. Allowing time for the tendering and the delivery of the buses, we envisage that the trial could start within 2012.

15. To monitor the trial, we will set up a task force with representatives from the participating franchised bus companies and government departments, including the Transport Department and the Environmental Protection Department.

FINANCIAL IMPLICATIONS

16. The workhorses of franchised buses in Hong Kong are three-axle double-deck buses. Based on information provided by a potential hybrid bus supplier, we estimate that a three-axle double-deck hybrid bus with full air-conditioning suitable for Hong Kong could cost about \$5 million. About \$30 million will be required for procuring six such hybrid buses. To allow for a 10% contingency, the total cost will be about \$33 million.

17. Therefore, we propose to create a new commitment of \$33 million for the proposed trial. Procurement of the hybrid buses by the bus companies with Government's full funding support will be made in 2011-12 and it is estimated that a 10% deposit (about \$3.3 million) will be required. The hybrid buses are expected to be delivered in around a year's time and the balance (about \$29.7 million) will be paid in 2012-13. The actual cash flow will depend on the tendering results and exchange rate fluctuations. For planning and budgetary purpose, the estimated cash flow is as follows –

Financial Year	(\$ million)
2011-12	3.3
2012-13	<u>29.7</u>
Total	33.0

18. Additional staff resources will be allocated to oversee the trial, evaluate the environmental performance of the hybrid buses and the trial results, and work with the participating franchised bus companies, bus manufacturers and relevant government departments, to take forward the trial. The additional manpower resources will be reflected in the Estimates of the relevant years.

PUBLIC CONSULTATION

19. We consulted the Legislative Council Panel on Environmental Affairs (the Panel) on 24 January 2011. Some members asked the Government to expedite the trials of hybrid buses and electric buses. There were also requests to include additional requirements for switching to cleaner buses in the bus franchises. The Panel agreed for us to seek funding approval from this Committee.

BACKGROUND

20. To reduce air pollutants from the motor vehicles including franchised buses, we have been pursuing a combination of measures as follows –

- (a) introduce clean alternatives to diesel vehicles where practicable;
- (b) adopt the most stringent vehicle emission and fuel standards where practicable;
- (c) provide one-off grant to encourage commercial vehicle owners to replace their old vehicles with new ones complying with the prevailing emission requirements;
- (d) provide tax incentives to encourage the use of environment-friendly vehicles;
- (e) mandate pre-Euro diesel vehicles to be equipped with emission reduction device for licence renewal;
- (f) adopt practical technology to reduce emissions from the existing vehicle fleet;
- (g) ensure proper maintenance of in-use vehicles through a combination of voluntary and regulatory measures;
- (h) introduce the Motor Vehicle Idling (Fixed Penalty) Bill through the Legislative Council for statutory prohibition against idling vehicles with running engines;
- (i) encourage franchised bus companies to retrofit suitable emission reduction devices to their bus fleets so as to reduce emissions;
- (j) work with the District Councils and the franchised bus companies to pursue cancellation, amalgamation, truncation of bus routes and frequency reduction where appropriate so as to reduce the number of bus trips and bus stopping particularly on busy corridors;

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- (k) conduct a trial to retrofit Euro II and Euro III franchised buses with selective catalytic reduction devices to reduce nitrogen oxides emissions;
- (l) encourage the franchised bus companies to deploy more environmental-friendly buses to serve the busy corridors; and
- (m) plan to implement pilot low emission zones for franchised buses along the busy corridors in Causeway Bay, Central and Mong Kok.

Environmental Protection Department
April 2011