

**For discussion on  
26 November 2001**

**Legislative Council  
Panel on Environmental Affairs  
Panel on Transport**

**LIGHT BUSES USING CLEANER FUEL**

**INTRODUCTION**

This paper sets out the Administration's proposed incentive scheme to encourage diesel light bus owners to replace their vehicles with ones that are run on liquefied petroleum gas (LPG) or electricity.

**BACKGROUND**

2. In the 1999 Policy Address we set the targets of reducing respirable suspended particulate (RSP) and nitrogen oxide (NO<sub>x</sub>) emissions from motor vehicles by 80% and 30% respectively by the end of 2005. We also announced that we would launch a six-month trial scheme for LPG light buses and that, if the results were satisfactory, we intended to provide financial assistance similar to that for the taxi trade to encourage operators to switch over to LPG light buses. Replacing all the existing 6 000-odd public and private diesel light buses with LPG ones is expected to reduce the RSP and NO<sub>x</sub> emissions from motor vehicles by 4% and 2% respectively.

**PUBLIC LIGHT BUSES**

3. The number of public light buses (PLBs) has been frozen at 4 350 since 1976 by an order of the Executive Council. Since then, the limitation order has been extended from time to time through resolutions made by the Legislative Council. The limitation order was last extended by the Legislative Council in June 2001 for five years. There are currently 2 443 green PLBs, which run on 325 fixed routes specified by Transport Department, and 1 907 red

PLBs operating on about 140 flexible routes. Their seating capacity is set at 16 at present.

4. We conducted a trial of LPG and electric light buses on six green PLB routes and one red PLB route from June 2000 and January 2001. The electric light buses were included at the request of the PLB trade. As we have previously reported to the Panel on Environmental Affairs and the Panel on Transport, the trial indicated that –

- (a) an LPG PLB emits almost zero RSP and only 50% of NO<sub>x</sub> of a Euro III diesel PLB. Electric PLBs are emission-free;
- (b) both LPG and electric PLBs would be suitable for use in Hong Kong. However, the latter would be suitable for shorter routes only because of battery constraints; and
- (c) despite the lower LPG price compared with diesel, operators of PLB routes that are some distance from LPG stations will experience net income reduction if they replace their vehicles with LPG ones. This is because they would have to go out of the way to refill their fuel tanks. Some of them would also have to refill more frequently as LPG is less efficient than diesel<sup>1</sup>. During the refilling periods, they would have to stop operating and receive no fare.

5. As there are about 465 PLB routes, the seven routes selected for the trial were not fully representative. We therefore carried out a more detailed analysis of the impact of replacing diesel PLBs with LPG ones on all the PLB routes taking into account the following factors –

- (a) the 45% reduction in LPG price compared with that at the beginning of the trial;
- (b) the anticipated improvement in the network of LPG stations in 2002; and
- (c) the 40% enlargement (i.e. to the maximum possible for a 16-seat model) of the fuel tank of an LPG PLB.

6. Our analysis shows that, when the number of LPG stations increases to

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<sup>1</sup> One litre of diesel allows a PLB to run 87% higher mileage than one litre of LPG.

45 by the middle of 2002, 68% of the PLB operators will experience a net income increase from a marginal amount to \$3,000 a month if they replace their diesel PLBs with LPG ones. The remaining 32% will face net income reduction from a marginal amount to above \$3,000 a month. The situation will not change much if the number of LPG stations increases to 50 in 2004 as currently planned, since the major factor determining the number of refills is the size of the gas tank and not the number of stations. A mandatory replacement scheme will make some PLB operators worse off and arouse strong opposition from the trade.

7. We have examined the following options for addressing the problem of net income reduction and considered them not practicable -

- (a) improving geographical distribution of LPG stations – because of safety requirements, it will not be possible to provide LPG stations close to all PLB routes;
- (b) acceding to the request of some PLB operators to increase PLB seating capacity – this will have serious traffic and transport implications as set out at the Annex; and
- (c) allowing a fare increase – only green PLB fares are regulated and 2-12% fare increase will be required to compensate the net income reduction. This will create a burden on the community.

Since there is no feasible solution for the income reduction that will be experienced by some PLB operators, we consider that a mandatory replacement scheme should not be pursued.

8. We have examined the alternative of doing nothing, relying on the natural replacement of existing PLBs with diesel ones that meet the latest emission standard of Euro III that we plan to introduce from early 2002 onwards. However, this will mean that by the end of 2005, we will achieve only 75% of the RSP and 40% of the NOx reductions anticipated under a full and mandatory replacement scheme.

9. For some of the 68% PLB operators whose income would increase after they replace their vehicles with LPG ones, the increase would be on the lower side of the range. We therefore propose to offer incentives in the form of a one-off grant with deadline for applications to encourage early replacement.

The proposed scheme includes the following elements –

- (a) owners of diesel PLBs who replace their vehicles with an LPG or electric model before end-2004 will be offered a one-off grant of \$60,000 or \$80,000 respectively;
- (b) to encourage early replacement particularly of older PLBs, the deadlines of application for the one-off grant for owners of diesel PLBs aged 10 or above at the time of replacing their vehicles will be end-2003 and for owners of diesel PLBs below 10 years old at the time of replacement end-2004; and
- (c) also for the purpose of encouraging early replacement, the one-off grant will be made available to owners who have already replaced their diesel PLBs with LPG or electric ones before the Administration starts accepting applications for the one-off grants.

The one-off grant for the replacement of a diesel PLB with an LPG one, together with the much lower LPG price, should attract many PLB owners to replace their vehicles with LPG ones. A few diesel PLB owners may also opt for replacement electric PLBs.

## **PRIVATE LIGHT BUSES**

10. The number of private light buses has remained stable over the years and currently stands at around 2 000. About half of them are 12-seat models. 60% of these 2 000-odd private light buses are nanny vans. While the availability of 16-seat LPG and electric light buses is confirmed, manufacturers have no plan to produce 12-seat LPG or electric models.

11. We do not propose to mandate the replacement of the 12-seat private light buses with 16-seat LPG models, as they do not require a higher capacity and using bigger models will go against the principle of making efficient use of our roads. There is also no strong reason to compel the replacement of 16-seat diesel private light buses as their emission contribution to the entire diesel light bus fleet is only 10%. Furthermore, if we pursue a mandatory scheme to replace 16-seat diesel private light buses, operators whose areas of operation are some distance from LPG stations are likely to be inconvenienced and would raise strong objections as in the case of PLBs.

12. We propose the provision of an incentive with deadline for application to encourage the early replacement of diesel private light buses with LPG ones. As most private light bus operators do not run schedules as intensive as PLB operators and will have less constraints on refilling, there is no justification to offer them the same incentives as for PLB operators. The incentive for private light bus owners would be in the form of First Registration Tax (FRT) <sup>2</sup> exemption with the same deadlines for applications as for the PLB one-off grants and allowance for retroactivity. Many owners of diesel private light buses should take up the offer, as private light buses have more flexibility on refilling.

## **LPG LIGHT BUS SUPPORTING INFRASTRUCTURE**

13. When the third batch of dedicated LPG stations is completed by the middle of 2002, the number of LPG stations will increase to 45. By then, there will be adequate LPG filling capacity for the entire fleet of 18 000 taxis and 6 000-odd light buses. We will continue to seek to improve the geographical distribution of LPG stations where practicable to encourage more diesel light bus owners to replace their vehicles with LPG ones.

14. The maintenance requirements of diesel and LPG light buses are similar, except that work on the latter's fuel system would have to be carried out in LPG vehicle workshops for safety reasons. The majority of repair work, i.e. those not involving the LPG fuel system, could be carried out in ordinary vehicle workshops. As the maintenance requirements of LPG light bus will gradually increase with the growth in the number of LPG light buses and their age, we believe that the number of such maintenance facilities will increase as demand increases and that we could rely on market forces to provide the required facilities. We will continue to monitor the situation.

15. There are constraints in installing charging facilities for electric light buses on most of the green PLB terminus due to lack of space and technical problems arising from the presence of underground utilities. However, we will provide assistance to PLB operators who are interested in replacing their diesel light buses with electric models in setting up charging facilities where

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<sup>2</sup> The FRT of a light bus is 4% of its taxable value.

practicable. According to the supplier of electric light buses, ordinary light bus workshops would be capable of maintaining and repairing electric light buses.

## **ENVIRONMENTAL IMPLICATIONS**

16. If 68% of the PLBs and half of the existing 16-seat private diesel light buses are replaced by LPG models and assuming that very few will opt for an electric model, we will achieve 90% of the RSP and 70% of the NOx reductions anticipated under a full and mandatory replacement scheme.

## **FINANCIAL IMPLICATIONS**

17. We estimate that the financial implication of offering the one-off grants to PLBs and FRT exemptions to private light buses would be \$184 million (\$178 million for one-off grants for PLBs and \$6 million revenue forgone in respect of FRT exemption for private light buses). This is calculated on the assumptions that 68% of PLBs and half of the 16-seat private light buses will take up the incentives offered and replace their vehicles with LPG ones. Because of their operational constraints, very few, if any, will replace their light buses with electric ones. If all PLBs and private light buses take up the offers, the financial implications will be \$285 million (\$261 million for one-off grants for PLBs and \$24 million for private light buses).

## **UPGRADING EMISSION STANDARD OF LIGHT BUSES TO EURO III**

18. In May this year when we submitted the proposal to the Legislative Council to upgrade the emission standards of newly registered vehicles to Euro III, we informed the Council that we had deliberately excluded diesel light buses from the relevant amendment regulation pending the way forward on alternative-fuel light buses. As we now propose to encourage light buses to replace their vehicles with LPG or electric ones, and to allow the continued use of diesel light buses, we propose to proceed with upgrading the emission standard for newly registered diesel light buses to Euro III. We will be submitting the required amendment regulation to the Legislative Council for

approval shortly. As suggested by some Members and the trade, the Commissioner of Transport will suitably relax the weight limit on diesel light buses where practicable to enable a wider range of diesel light buses to be supplied to Hong Kong.

## **WAY FORWARD**

19. We are consulting the light bus trade on the proposed incentive scheme. We aim to start accepting applications for the one-off grants and FRT exemption about a month after funding approval has been obtained from the Finance Committee.

## **ADVICE SOUGHT**

20. Members of the Panels are invited to comment on the proposed incentive scheme.

**Environment and Food Bureau**  
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**Increase PLB Seating Capacity  
Traffic and Transport Implications**

**No transport need for additional PLB capacity**

1. There is no general shortage of supply in PLB capacity to meet passenger demand. Transport Department's surveys show that passenger waiting time for PLB routes is generally quite short.
2. In order to ensure efficient use of the limited road space, any need to increase the capacity of the public transport system should preferably be met by enhancing the carrying capacity of the mass carriers where appropriate. With the opening of new railways over the next three years (MTR Tseung Kwan O extension, West Rail, Ma On Shan to Tai Wai Rail Link and KCR Tsim Sha Tsui Extension), there will be additional public transport capacity providing fast and reliable services to commuters. It is necessary to ensure efficient use of transport resources and continue to regulate the growth of public transport modes.
3. In June 2001, having considered the overall transport market situation and future development, and the supplementary role of PLBs in the public transport system, the Legislative Council passed a resolution to maintain the PLB fleet size at 4,350, thereby maintaining the overall passenger handling capacity of the PLB fleet which operate on 16-seat vehicles. An extra 4 or 8 seats to each PLB would result in an increase in the overall capacity of the PLB fleet by 25% or 50% respectively, which is equivalent to an increase of 1,088 PLBs or 2,175 PLBs respectively. The possible traffic and transport implications must be fully taken into account.

**Adverse impact on traffic congestion**

4. Larger PLBs would require longer time to be reasonably filled up with passengers. The existing situation whereby some PLBs drive at very slow speed along busy corridors to wait for passengers is a major traffic problem. Provision of extra PLB seats would likely exacerbate this



problem, which would mean longer waiting time for passengers, more delay to general traffic and hence higher emissions from vehicles on the road.

5. Increasing the seating capacity of PLBs to, say, 20 or 24 will require a vehicle longer than the existing PLB vehicles. As a result, there would be a shortfall of terminal space for PLBs and some of the on-street PLB terminal may need to be extended, which would affect the traffic condition in these areas.

#### Divergent views within and outside the PLB trade

6. There are less well patronised PLB routes that would obtain no or very limited financial benefit from an increase in PLB seating capacity. They would have to face the difficulties with the generally higher operating and maintenance costs of larger PLB vehicles if the PLB seating capacity is increased.
7. There are divergent views within the PLB trade on whether the seating capacity should be increased. Concerns have been expressed by some sectors within the trade that such an increase would likely result in higher PLB licence fee, insurance premium and vehicle rental, which would affect the income of PLB operators and drivers. Some taxi operators have also expressed opposition to an increase in PLB seating capacity which, they believe, would further affect the livelihood of taxi operators.

**Transport Bureau/Transport Department**  
**November 2001**