

Proposed Application to the Hong Kong SAR Government for a Grant from the Pilot Green Transport Fund for the Purchase of experimental Electric Trolley Buses for use on Discovery Bay Road



In 2010 the Hong Kong Government introduced and set up a \$300 million Pilot Green Transport Fund (PGT Fund) to encourage the public transport sector to test green innovative technologies. Initially this fund was used for the purchase two hybrid buses for each of the three main franchised bus companies for use on heavily congested corridors on Hong Kong Island and in Kowloon. Towards the end of 2010 the Government announced that applications for the use of this fund would be extended to operators of non-franchised public buses, provided that a good case is presented and that the application is not frivolous.

2. Discovery Bay has always been presented as an environmental showcase and was designed as a car-free zone. Discovery Bay Road would therefore present the ideal location for using electric trolley buses. Electric trolley buses suitable for use in Hong Kong are already available on the market (both from Europe and China) and these trolleys little more than conventional diesel buses. Moreover they are cheaper to maintain and generate no local exhaust gases.

3. A trolley bus system requires that overhead wires are installed along the route. In former times these overhead systems were bulky and unappealing to the eye. In recent years wire systems have improved and are now much neater and less unsightly. Given that Discovery Bay Road is a tree lined road, the erection of wires would hardly be noticeable. During the 1990's Citybus conducted tests on an experimental double-deck trolley bus on a test track at Wong Chuk Hang. Unfortunately the then Secretary for Transport showed little enthusiasm for this green transport technology and the idea therefore received no support from Government officials. China Light & Power Company (CLP), however, did show considerably interest in the project and unofficially it was suggested that if a viable scheme for the use of trolley buses on Hong Kong roads could be introduced the company was willing to consider funding the cost of the infrastructure and the wiring which would then would then be leased back to the operator. If Discovery Bay proceeded with such a system it is suggested that CLP are approached to come on board and assist with the funding and erection of the wiring system and any associated power sub-stations which might be needed.

4. Suitable trolley buses for use on Hong Kong roads are commercially available using chassis manufactured by MAN, which is already the preferred choice of bus supplier for DBTSL. The body-work can be ordered to local specifications and be assembled in China using companies such as Zhengzhou Yutong Bus Co. or Youngman Automotive Group who have a partnership with (German) MAN. It is estimated that the cost of two trial electric trolleys would cost little more than the conventional MAN diesel buses. The cost of wiring and infrastructure for approximately 3 kilometres of double-wired track would probably be about HK\$ 6 - 8 million if the contract is awarded to one of the experienced mainland companies specializing in this work. There are several possible suitable mainland companies. Trolley buses are manufactured in several mainland factories with extensive trolley bus systems operating in Shanghai, Guangzhou, Wuhan, Beijing, Qingdao and Hangzhou

5. It is suggested that the initial test route is laid along the length of Discovery Bay to DB North and then around Sienna Avenue back to the main road. The wiring would extend into the main bus terminus. There would be no initial requirement for the wiring to extend to bus depot in Marina Drive because the trolley buses can be designed to run on a small "donkey" engine, which can generate enough power to operate the trolley at low speeds to the depot.

Advantages of Electric Trolley Buses

Trolley bus systems operating on electricity have no local emissions and are therefore more environmentally friendly. The electric power required is generated at central power stations where the energy efficiency ratio from the burning of fossil fuels is much higher than in diesel engines. Emissions from power stations are also centralized and therefore much easier to “clean” if there is a good regulatory regime.

Vehicle noise is much reduced.

Overall energy consumption for electric trolley buses is less than for diesel powered buses. This is made possible by the electric motor having a more efficient use of power ratio as well as reduced consumption when the vehicle is stationary (diesel engines continue to burn fuel when idling whereas trolley uses no power at all except for lighting and air-conditioning). In addition to this when the vehicle is braking there is a regenerative creation of electrical power which is fed back into the electricity supply.

Maintenance costs for electrical vehicles are generally lower because the electric motors usually require less maintenance and require fewer spare parts than diesel engines. The maintenance of other items, such as wheels and tyres etc., is identical to that on diesel buses.

The initial investment costs for a trolley system are higher because of the need for the wiring infrastructure. However these additional are offset by the electric vehicles having a much longer economic life. (typically 20 years compared with 12 years for a diesel-powered bus)



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