

Table 8.2a
Mitigation Measures to Improve Air Quality

Mitigation Measures	Description	Short-list
Emission Control Technologies		
<i>Engine Technologies</i>		
Hybrid Vehicles	A hybrid vehicle is a mixture between traditional combustion engine powered vehicle and electric car. The car is powered by the electric motor whenever possible and hence reducing pollutant emissions.	Yes
Electric Vehicle	Electric vehicles are sometimes referred to as "zero-emission vehicles" because they produce no emissions from the tailpipe. The use of electric vehicles could reduce emissions of carbon monoxide and smog-forming pollutants in urban areas.	Yes
Fuel Cell Vehicles	Like Electric Vehicles, Fuel Cell Vehicles are also considered to be "zero-emission vehicles".	Yes
Tailpipe Emission		
Diesel Catalytic Converters	Diesel Catalytic Converters can reduce the particulate emissions of diesel buses and are mandatory in the USA.	Yes
Particulate Traps on Diesel Vehicles	Could reduce particulate emissions from light goods diesel vehicles.	Yes
Alternative Fuels		
Reformulated Diesel	Sometimes know as "ultra-low sulphur diesel" or "city diesel" depending on the composition. Reformulated diesel reduces pollutant emissions and is commercially available.	Yes
LPG	LPG as a fuel for road vehicles is very common in other countries and minimises particulates emissions and reduces emissions of some other pollutants. The Government has committed to introduce LPG as an alternative fuel for taxis. Introduction of LPG for other vehicles (petrol or diesel) to reduce pollutant emissions can also be considered.	Yes
Natural Gas	The only source of natural gas supply to Hong Kong at present is that used for power generation at the Black Point Power Station. To introduce natural gas as an alternative fuel in addition to the LPG infrastructure will be expensive and may not be cost effective.	No
Hydrogen	Hydrogen is used as a fuel in Fuel Cell Vehicles (see above).	Yes
Methanol	At present, only methanol produced from wood is able to give substantial reductions in pollutant emissions. Using methanol as a vehicle fuel only remains a long term option and is outside the time frame of the CTS-3 study.	No
Ethanol	Similar to Methanol.	No

Mitigation Measures	Description	Short-list
Alternative Power Sources (wind/solar)	Although they are the most environmentally friendly form of energy, these technologies are not envisaged to be commercially viable within the timeframe of the CTS-3 study.	No
Traffic Control Measures		
Traffic Control	The implementation of traffic control schemes can result in reductions in fuel consumption and vehicle emissions.	Yes
Parking Control	Studies have suggested that by doubling parking charges within a city, the car share of the number of trips could be reduced in the central business district by about 13%. However, parking spaces in Hong Kong are already very limited and parking fees are high. People generally will not rely on on-street parking if they decide to take the car to work and there is very little influence on parking fees charged by private companies. Parking control is unlikely to be an effective measure in Hong Kong.	No
Park and Ride	Park and ride schemes provide parking serviced by buses or rail on the fringes of city centres. The aim is to encourage transfers from private to public transport, particularly for journeys into city centres.	Yes
Bus-only Lanes	Bus-only lanes are intended to increase the attractiveness of buses and reduce journey times and hence emissions. Although the traffic speed increases within these priorities lanes, other traffic may be delayed due to less road space which can outweigh any benefits.	No
Car Pooling	Where average occupancies are less than 1.5, filling all car seats with other car drivers would yield a reduction in vehicle emissions of 80%. However, there are important obstacles, notably the inconvenience of scheduling activities, such as commuting, with other people. Since over 80% of journeys made in Hong Kong are already by public transport, car pooling is not a high priority measure.	No
Electronic Road Pricing	A separate study on Electronic Road Pricing (ERP) is currently being conducted and will address environmental issues. ERP is an effective means to control emissions in pollution "hot-spots".	Yes
Modes of Transport		
Maintain attractiveness of public transport	Encourage the use of public transport as a means of managing the growth in vehicle traffic volume.	Yes
Trolley Buses	Trolley buses are a form of "zero-emission vehicle".	Yes
Freight Transport by Rail	Use of rail for freight movement instead of goods vehicles which are one of the main contributors to pollutant emissions from road transportation.	Yes
River Trade Terminal	Marine Transport for goods can reduce the no of trips made by cross boundary made heavy goods vehicles.	Yes

Mitigation Measures	Description	Short-list
Transport Policies		
<i>Vehicle Restraints</i>		
Controlling Vehicle Growth by Capping Number of Vehicles or Applying Fiscal Measures	Any measures to reduce the number of vehicles will reduce pollutant emissions.	Yes
<i>Areas Restrictions</i>		
Areas Restrictions / Heavy Vehicle Restrictions	Reducing the number of vehicles in certain areas is an effective means of tackling air pollution "hot-spots".	Yes
Area Restrictions linked with Air Pollution Index	Area restrictions apply when the API is predicted to be high.	Yes
Others Policies		
Controlling Motorcycle Emissions	At present, there are no controls on emissions from motorcycles in Hong Kong. Introduction of stringent emission standards is planned for the end of 1999.	Yes
Limiting Vehicle Fleet Age	Older vehicles are more polluting due to less stringent emission controls and most often a lack of maintenance.	Yes
Inspection of Maintenance Programme	Significant reductions in pollutant emissions could be achieved with proper maintenance.	Yes
Cycling and Walking	Two of the most environmentally friendly modes of transport.	Yes
Pedestrianisation	In this manner, the sensitive receivers are isolated from the source of pollution.	Yes
Switch off Engines when Stationary	Pollutant emissions may cause nuisance to other road users when vehicles are idling.	Yes
More Frequent Street Cleaning	A large proportion of RSP emissions arises from the resuspension of dust on the road surface due to road/tyre interaction and vehicle movement.	Yes
Integrated Land Use and Transport Planning	To encourage shorter trips from residential areas to the work place.	Yes

8.2.3 Discussion

Emission Control Technologies - Electric Vehicles

Electric vehicles, sometimes referred to as "zero-emission vehicles (ZEVs)", are gaining attention as an option for improving air quality. Zero tailpipe emissions are particularly attractive in urban areas with serious air pollution problems. Electric vehicles are powered by a battery or set of batteries. Whilst tailpipe emissions are eliminated by this technology, pollutants are released into the atmosphere where the electricity is generated. Other environmental issues include the disposal of end of life batteries. Notwithstanding these issues, electric vehicles and other ZEVs are seen as a way forward to tackle air quality problems in densely populated areas with heavy traffic.