

Transport Links

Chapter 13



CHAPTER THIRTEEN

TRANSPORT LINKS

1. In the formulation of the transport network, consideration was given to the findings of ongoing planning and development studies, the results obtained from the previous evaluations for the TDS transport studies, and the assumptions made with regard to land use and distribution. The increased number of strategic transport links associated with Scenario B (high growth) are a direct result of the increased population and cross border traffic, and at the airport and port.
2. The functional differences between Scenarios A and B are essentially the proposed new North - South Highway between the border and Metro area under Scenario B combined with the D3 Green Island Link compared to the D2 promulgated for Scenario A. Route Y is now proposed as a common component for the two Refined Preferred Options. The rail links between Tai Wai and Diamond Hill, Hung Hom and Fortress Hill and Lam Tin with Ma Tau Kok via Kowloon Bay are all proposed for Scenario B. Other alignments such as the Zhuhai Bridge were not included in the transport testing but could have extremely serious environmental consequences, including the increase in air pollution and noise at or near the proposed landing points at Tuen Mun and/or Lantau Island, and the serious consequences on water quality if the connection is not by a totally submerged tunnel.

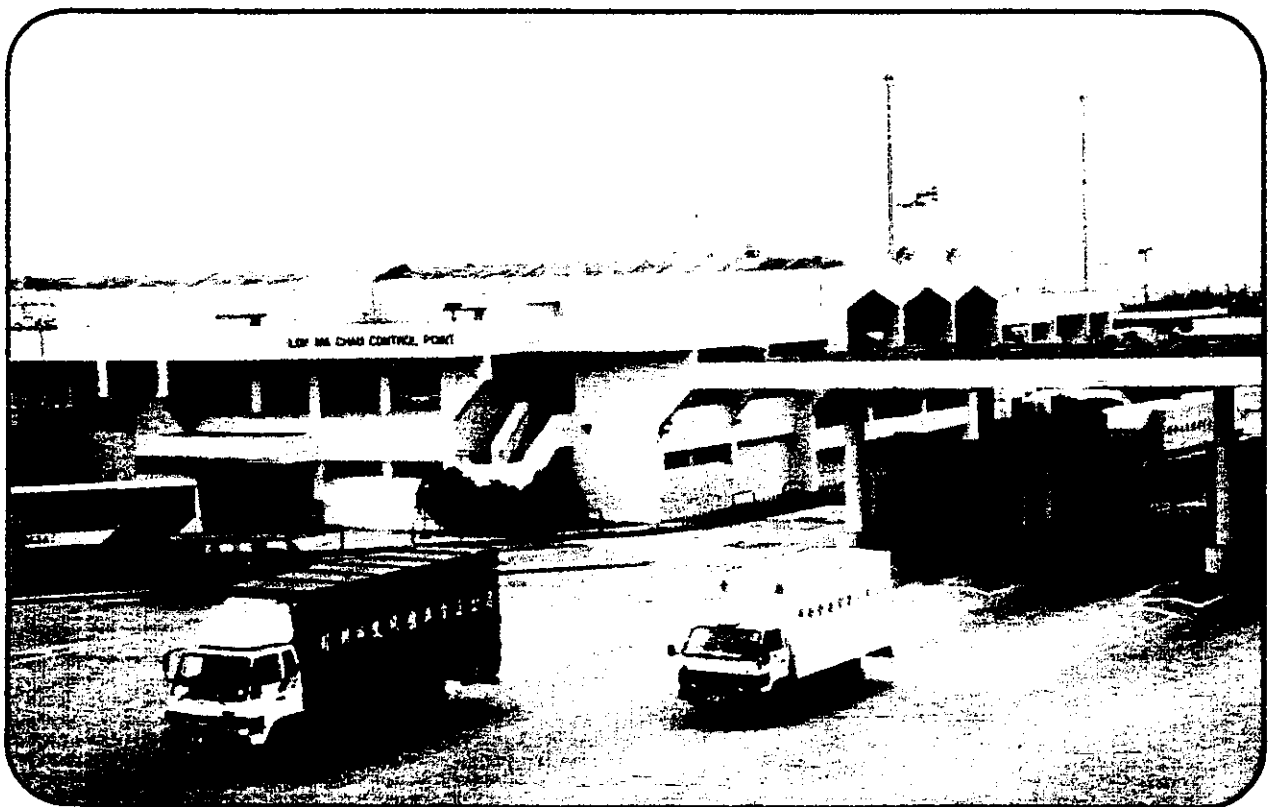
Road Networks

Water Movements and Water Quality

3. The only proposed road crossing which could have an adverse impact on water quality, circulation and sedimentation patterns is the long term Route Y link. This has been proposed to connect the ports and airports of the Pearl River Delta and to provide easy access throughout the region. It should be noted it is a long term strategy which will require detailed feasibility studies.
4. Air quality and noise issues could also arise at the tunnel portals. The optional component of this crossing is referred to as Lower Pearl River Crossing (LPRX) which connects the west coast of the Pearl River Delta to the east. All of the connections hitherto identified traverse the mouth of the Estuary. Implications of this include the potential scouring of bridge supports or silting up behind a tunnel (unless totally submerged).
5. Route Y is the strategic transport link with the greatest potential to adversely affect circulation, sedimentation and water quality. Various options have been proposed for Route Y, all of which, except the connection made via Neilingding Island, require a connection to be made across the mouth of Deep Bay. In the assessment of the Hybrid Options, it was identified that this is an unacceptable transport link from an environmental perspective and even if the crossing was made by tunnel (pending detailed engineering feasibility studies), other adverse impacts could eventually arise during and following construction. Environmental assessments of the Route Y links were given in the Guangdong Development Study Phase II which should be referred to for further details of this conceptual transport link.
6. Detailed engineering feasibility and environmental impact assessments will be required to determine the viability of such crossings. A number of artificial islands would need to be constructed to provide supports for any bridged crossing which, depending on the location, size and number, could adversely affect existing circulation and sedimentation patterns.



Traffic queue at Lok Ma Chau border crossing



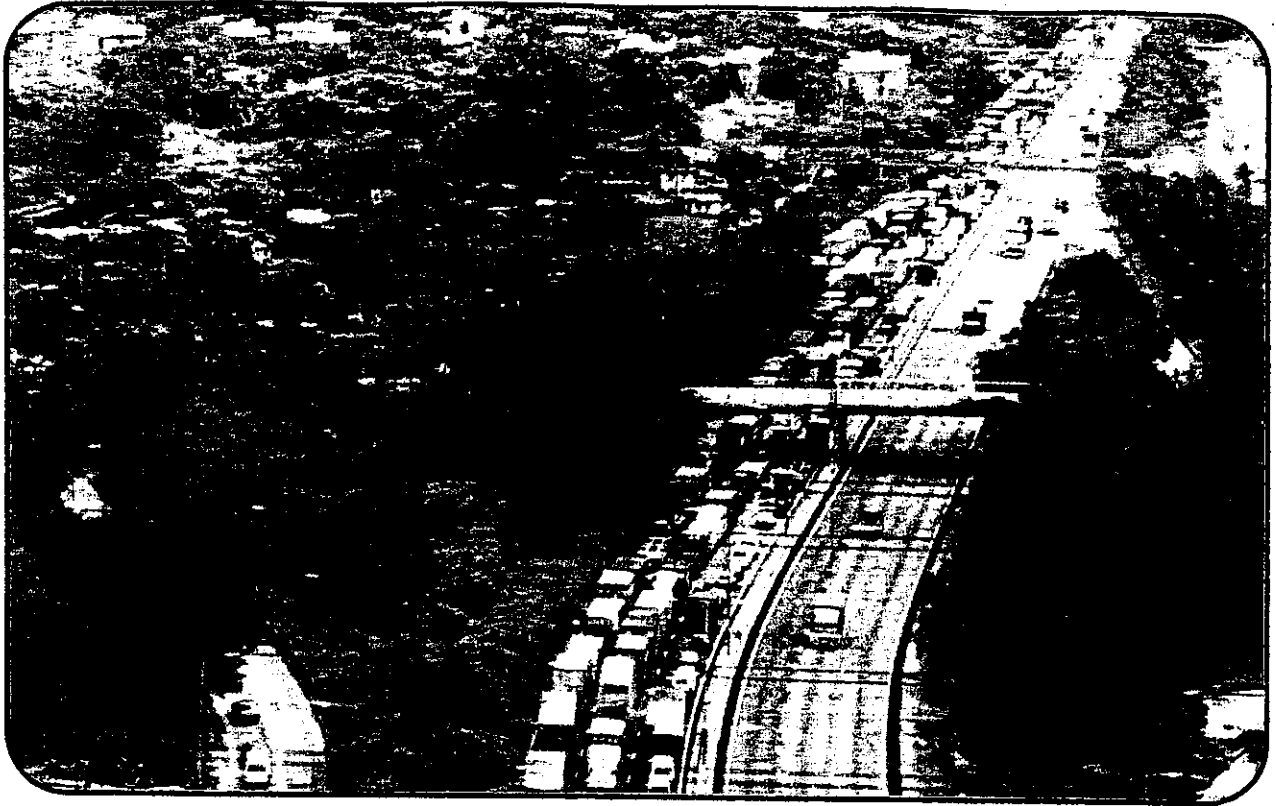
Increased heavy freight vehicles passing
the Lok Ma Chau border control point

Air Quality

7. Air quality impacts of the transport strategies have been subject to testing using a box model as described in Appendix A. The results of this detailed model testing are also given in Appendix A.
8. The key issues which were identified from the evaluation of the transport strategies were that the number of goods vehicles using the border crossing points increased from about 60,000 in 2001 to double that number by 2011 under Scenario A. For Scenario B the number of goods vehicles increased from about 66,000 to 144,300 over the same period (refer to Tables 4.4 and 4.5). The crossing point which is assumed to be most frequently used is Route Y for Scenario B, and Lok Ma Chau and Route Y for Scenario A.
9. The air quality modelling studies have identified that at least 50% of NO₂ emissions will be generated by these goods vehicles with more than 70% contribution in the Fanling and Yuen Long Air Control Zones. Although the forecast results show that the NO₂ AQO trigger levels will not be exceeded, the relative increases in pollution levels in these areas will need to be carefully considered in connection with the proposals for residential developments. The transport strategies proposed are forecast to have the greatest effect on the Harbour and Tuen Mun Air Control Zones with the NO₂ AQO trigger level being or almost exceeded for both Scenarios.
10. The major contributor to the air pollution problem is the number of goods vehicles travelling through each ACZ and in particularly the Tuen Mun and Harbour ACZ's. From the results given in Chapter Six, it is apparent that the Tuen Mun ACZ will be most adversely affected by the emissions from traffic, with the NO₂ AQO trigger level exceeded in the medium term under Scenario B. It is apparent that under the transport strategies proposed for the Refined Preferred Options, air quality will be a key issue in the medium term in the Harbour ACZ and especially the Tuen Mun ACZ.
11. The concept of providing a freight/goods marshalling yard in the Shenzhen should be considered especially in the context of reducing goods vehicle traffic into Hong Kong, which would in turn reduce the vehicle emissions to be assimilated in the NT and Metro area.
12. Other intra-territorial measures to reduce the emissions in the Harbour ACZ could include restricting access of goods vehicles to the Metro area. In Tuen Mun ACZ however, such measures are more complex and difficult to implement as they have far reaching regional as well as territorial implications.
13. In Lantau, under Scenario B, the forecast doubling of NO₂ emissions between 2006 and 2011 due to goods vehicles, gives some cause for concern in connection with the objective of maintaining the high quality environment for this new development area. It should be stressed that the model predictions for Lantau airshed are exaggerated due to the configuration of the air quality (box) model which assumes all of the emissions are concentrated in a small area. The recommendations to reduce or minimise the levels of emission are however valid.

Noise

14. Road transport strategies were examined using the forecasts for the year 2001 as the baseline scenario against which the performance of the medium and long term strategies were tested. The first observation was that the results at very few of the stations for monitoring/forecasting traffic flows were acceptable in terms of the Hong Kong Planning Standards and Guidelines (70 dB(A)). In many instances the predicted noise levels were in



Serious traffic congestion on Tuen Mun Highway

(Credit : Apple Daily)



Restricting access of goods vehicles to Metro Area could reduce emissions in the Harbour Air Control Zone

excess of 75 dB(A) even outwith the Metro area. In general very minor differences were observed between the baseline and the medium and long term strategies (less than 1 dB(A) is not considered to be significant). Of greater interest is the pattern of change in the noise climate forecast over a decade and thus the implications this could have on the development potential for certain areas.

15. In Metro area, the noise generated by traffic from the strategic tunnel systems (Cross Harbour, Eastern Harbour Crossing and Aberdeen Tunnel) and the Island Eastern Corridor are forecast to alter very slightly over the time frame examined. This is of interest as the degree of congestion of these linkages indicates other transport related problems.
16. In NENT and NWNT, the noise forecast increases of less than 3dB(A) over the decade between 2001 and 2011 were identified in Chapter 8 as areas of concern especially in connection with the new residential developments proposed in, for example Fanling North. The traffic implications associated with the development strategies need to be considered in terms of noise, congestion on roads, actual capacities of the roads as well as the overall environmental quality of the area being developed. While not seeking to restrict traffic movements per se, the aim should be to consider ways to reduce the ambient noise levels in Metro area, and restrict the noise impacts of development in the NT through increasing the standards (using mechanisms such as the HKPSG and NCO).
17. In SENT, the forecasts made for traffic using the Tseung Kwan O tunnel indicated little change in the predicted noise levels as a result of increased development pressure. By way of contrast the forecast noise levels at the South Lantau Road were comfortably within the HKPSG provided even at for the 2006 and 2011 strategies.

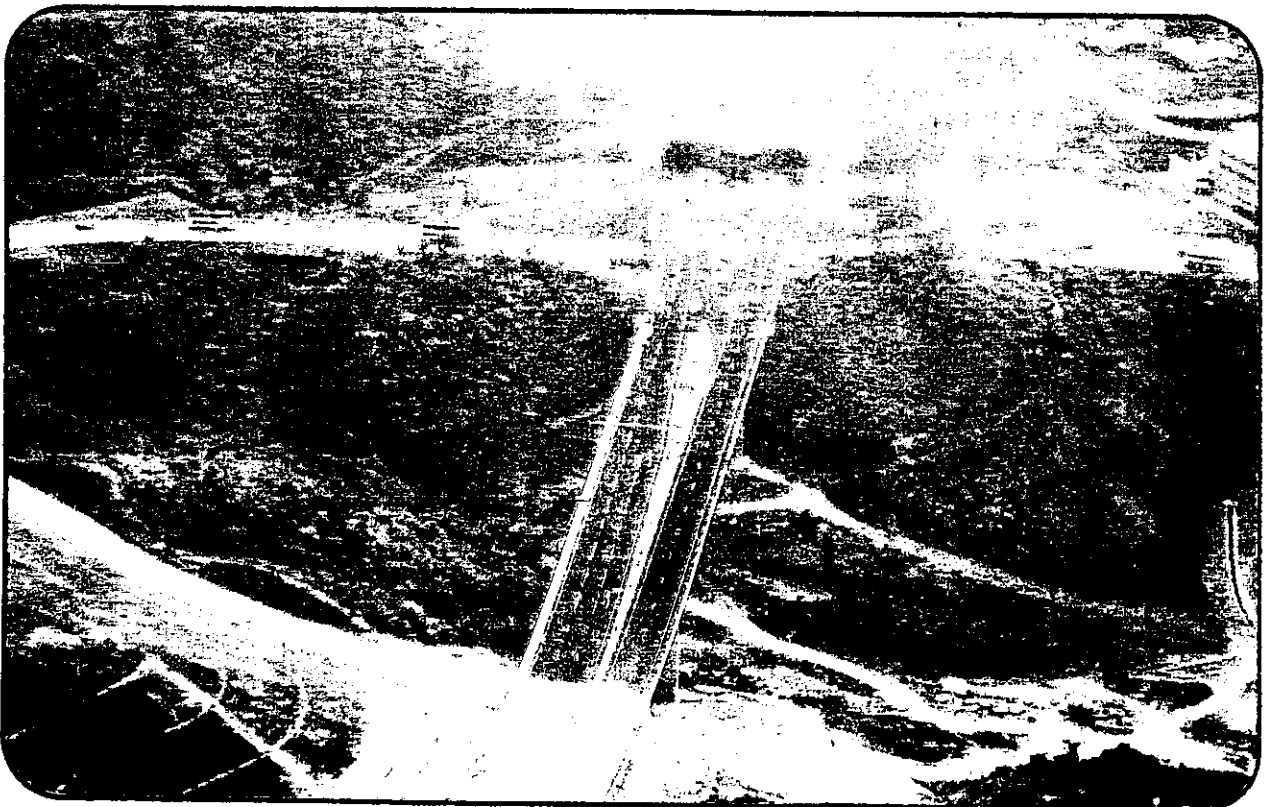
Guidelines for the Future Development of a Sustainable Transport Policy

18. In order to aim for a sustainable transport policy the following issues have been given priority in the development of the TDS Refined Preferred Options:
 - (a) integration of the land use - transport - environment planning as promulgated by the TDS. Feedback from the environmental studies into the transport model and needs for future development will be critical for the development of sustainable transport strategies. From the results of the air quality model, it is identified that the goods vehicles constitute the key concern with respect to NO₂ emissions. Such information needs to be used to determine ways to reduce this contribution with subsequent testing carried out using more sophisticated modelling techniques;
 - (b) minimising the need for transport and increasing the number of trips made on the least harmful (environmentally non-sensitive) nodes;
 - (c) aim for air quality standards which will prevent damage to health, including reduction in dusts, NO₂, and SO₂ especially in connection with emissions from goods vehicles which are notoriously problematic, as well as the control of vehicle emissions;
 - (d) increasing the amount of personal travel and freight transport by less environmentally sensitive routes; and
 - (e) preservation of conservation, scenic and amenity areas has been built into the land use - transport and environment scenarios and wherever possible new infrastructure has avoided encroachment on such areas;

19. Other strategies which aim to make the transport strategies sustainable include:
- (a) the reduction in noise from all modes of transport;
 - (b) the reduction in the demands placed by transport and industry on non-renewable resources;
 - (c) provide legislative controls to reduce noise levels; and
 - (d) develop and research new technology.
20. In addition to the foregoing the following recommendations are also made in connection with future transport policies:
- (a) investment in public transport should be enhanced over the next decade, and the measures in place to restrict private car ownership and to ensure public transport is embraced;
 - (b) recycled materials should be used wherever possible in road building schemes, while noise reducing materials should be applied to road surfaces and maintained in peak condition;
 - (c) early investment in light rail schemes is desirable although there is a time constraint on the development of such schemes;
 - (d) profits from any tolls or revenues collected by Government should be reinvested in developing a sustainable transport policy;
 - (e) if strategic roads have to cut through built up areas, the feasibility of putting them in tunnel or underpass should be seriously considered. The air and noise benefits accrued can be significant if these are designed properly. Such environmental considerations need to be included in the overall cost benefit analyses carried out for any new scheme.
 - (f) wherever practicable, through traffic should be diverted from roads passing through densely populated areas to bypass routes to reduce traffic flows in those areas;
 - (g) in the cost comparison between environmentally friendly options (such as underground railway and expressways) and their open road equivalence, external costs such as the loss of land premium due to the constraints imposed by an open road option capital and maintenance costs of the mitigation measures associated with the open road option and their visual impacts should all be considered;
 - (h) practicable technology should be fully exploited to reduce the tail pipe emissions from vehicles. Evolving technology, for example, ultra low or zero emission (such as electric vehicles) which requires the establishment of special infrastructure should be investigated;
 - (i) porous asphalt or whisper concrete should be used wherever practicable in resurfacing and should be mandatory for all new road construction;
 - (j) all new proposals should be examined in a regional context rather than in terms of the territorial impacts as the development of the linkages between Hong Kong and the Pearl River Delta will undoubtedly strengthen; and



Transport policy to restrict private car growth
should be considered



Strategic road in tunnel to minimise air and noise pollution

- (k) in recognition of the existing concerns with regard to air quality, and recognising the limitations of the present modelling study, it is imperative that a regional air quality model, and GIS database are developed for use in planning for the protection of the environment. This model should be, inter alia, integrated with the transport models currently in use to allow a proactive environment - transport strategy to be developed rather than reactive measures.