

2. REVIEW OF SCOPING STUDY ON EXISTING FLYOVERS

2.1 Methodology

2.1.1 In October 1996, ERM Hong Kong was commissioned by EPD to carry out the Scoping Study for providing noise mitigation measures on existing flyovers.

2.1.2 Data on all of the flyovers within the Territory were collected for analysis in the study. The selection of suitable flyovers for consideration with direct technical measures were divided into three major steps:

- to identify a list of flyovers that are suitable for further consideration with regard to the provision of direct technical remedies through a coarse screening of all flyovers in the territory;
- to assess the constraints in design and implementation of each mitigation measure to satisfy the requirements of various Government departments; and
- to predict the noise levels at the worst affected Noise Sensitive Receivers (NSRs).

2.1.3 The results of these three steps were used to prepare a list of recommended flyovers to which direct technical measures could be applied to bring environmental improvements to nearby NSRs. In each case, the recommendations included:

- the optimal form of the direct technical remedies;
- cost estimates for the remedies; and
- the likely noise reduction and number of dwellings to be benefited with the measures in place.

2.1.4 Seven key tasks were completed and they included the following sections:

2.1.5 Task 1 - Coarse Screening of Noisy Flyovers

2.1.5.1 A total of 188 flyovers in the territory were subjected to a multi-factor coarse screening process. Flyovers were excluded from further consideration if they met any one of the following three criteria:

- ***Location of flyovers:***

Flyovers which are located within Central Business District (CBD) and industrial and business areas were excluded from the review as commercial and industrial developments are not considered to be noise sensitive.

- ***Use of noise mitigation measures:***

Flyovers with existing direct technical remedies to reduce noise levels were excluded from the review.

- ***Completion of an Environmental Impact Assessment (EIA):***

Flyovers which had been subject to an EIA on or before 1997 were excluded from further consideration.

2.1.6 Task 2 - Assessment of Government Constraints for Direct Technical Remedies

2.1.6.1 Consideration was given to the special requirements of the various Government departments including the Highways Department (HyD), Transport Department (TD) and Fire Services Department (FSD).

2.1.6.2 Site visits were also conducted to collect the required information for the appraisal of physical site conditions and the effect that these constraints would have on the implementation of the mitigation measures. Heavily constrained flyovers that the necessary requirements could not be satisfied were excluded from further study.

2.1.7 Task 3 - Prediction of Noise Levels at the Nearest NSRs

2.1.7.1 It is noted that the current policy does not require protection of NSRs to redress the traffic noise problem arising from existing roads. Whilst road traffic noise problem was more amenable through planning process, for the purpose of analysing noise from existing roads, it was considered appropriate to adopt similar criteria for planning new roads or designating new NSRs. Those criteria according to the HKPSG required that the noise level L10(1hr) at the external facade due to road traffic should not exceed 70 dB(A) for domestic premises.

2.1.7.2 Calculation of Road Traffic Noise (CRTN) procedures, as published by the UK Department of Transport, were used to predict the noise levels at the nearest NSRs. Further consideration would be performed if the flyover was the dominant source of noise in the vicinity and that the noise level L10(1hr) at the external facade exceeded Hong Kong Planning Standard and Guidelines (HKPSG) Criteria for domestic premises.

2.1.8 Task 4 - Assessment of Direct Technical Remedies

2.1.8.1 The effectiveness of the potential direct technical measures including vertical barriers, cantilevered barriers, semi-enclosure, and full enclosures were assessed using CRTN procedures where the flyovers were suitable for treatment. It was anticipated that in some areas it would not be possible to provide sufficient mitigation to achieve the HKPSG standard. In these cases, the number of dwellings to be benefited from the remedies and the resultant reduction in noise level were employed to prioritise the selected flyovers.

2.1.8.2 It should be noted that the assessment did not consist of detailed noise modelling which was recommended to be carried out in Stage 2 study.

2.1.9 Task 5 - Compilation of a List of Recommended Flyovers for Treatment

2.1.9.1 A list of flyovers was compiled for treatment based upon the findings of the previous tasks. The list of recommended flyovers included details of the most appropriate type of barriers or enclosures, the estimated cost and the predicted noise reduction together with number of dwellings benefited from the measures. A ranking system based on 'cost per dB per dwelling' was established to prioritise candidate flyovers for further consideration.

2.1.10 Task 6 - Programme for Implementation

2.1.10.1 A programme was prepared to enable the optimum implementation of the recommended remedial measures on the basis of effectiveness.

2.1.11 Task 7 - Recommendations for Further Studies

2.1.11.1 The findings from the previous tasks were used to formulate recommendations regarding the engineering and environmental feasibility of the remedial measures for consideration in future studies.

2.1.12 The Scoping Study on Flyovers did not attempt to consider the detailed design of any direct technical remedies. Instead it attempted to provide information which would form the basis for Stage 2 study. It would be during these later stages of study that other issues such as engineering and structural considerations would be dealt with.

2.2 **Results of the Scoping Study on Existing Flyovers**

2.2.1 General

2.2.1.1 Based on the screening method adopted in the Scoping Study, the following 11 flyovers were prioritised and recommended for consideration in greater depth:

Priority	Flyover	Location	Direct Technical Remedies Recommended
1	NT71	Tsing Tsuen Road - near Riviera Gardens & Cheung On Estate	Semi-enclosure
2	K2	Kwai Chung Road - near Mei Foo Sun Chuen	5 m cantilevered barrier
3	K4	West Kowloon Corridor - between Willow Street & Tong Mi Road	3 m barrier
4	NT62	Tsuen Wan Road - near Clague Garden Estate	Semi-enclosure
5	K53	Kwun Tong Bypass - near Laguna City	5 m cantilevered barrier
6	NT25	Sha Tin Road - near City One Garden	Enclosure
7	H26	IEC - Oil Street to Tin Chiu Street	Semi-enclosure
8	H34	IEC - near Heng Fa Chuen	Semi-enclosure
9	K56	Tseung Kwan O Road - near Tsui Ping South Estate	Semi-enclosure
10	NT69	Tseung Kwan O Road - near Kwai Fong Estate	Semi-enclosure
11	H41	Ap Lei Chau Bridge	3 m barrier

2.2.1.2 As suggested in the Scoping Study, further consideration such as detailed cost estimation for noise mitigation measures, air quality and ventilation, public and traffic disruption, loss of sun light, visual impact, maintenance and structural impacts should be provided during this Study.

2.2.2 Ap Lei Chau Bridge

2.2.2.1 Ap Lei Chau Bridge was identified in the Scoping Study as a major noise source for the residents in Shan Ming Street, Ping Lam Street and San Shi Street. A 3 m high barrier was expected to reduce the noise from the flyover by 10 dB(A), and an overall noise reduction by approximately 5 dB(A).

2.2.2.2 The extent of noise mitigation measures on the flyover as recommended in the Scoping Study was illustrated in Fig. 1-1

2.2.3 Tsing Tsuen Bridge

2.2.3.1 Tsing Tsuen Road was identified as the top priority site in the implementation program and was found to be the dominant traffic noise source to the residents in Riviera Gardens, Tsing On THA and Cheung On Estate. A semi-enclosure is expected to reduce the noise from the bridge by more than 10 dB(A) and an overall noise reduction by approximately 5 dB(A).

- 2.2.3.2 The extent of noise mitigation measures on the flyover as recommended in the Scoping Study were illustrated in Fig. 1-2 & 1-3.
- 2.2.4 Kwai Chung Road Flyover near Mei Foo Sun Chuen
- 2.2.4.1 Kwai Chung Road Flyover was identified as the second priority site in the Scoping Study. It is a multi-lane carriageway which runs through Mei Foo Sun Chuen, linking Tsuen Wan Road to the north and Cheung Sha Wan Road to the south. A 5m cantilevered barrier has been identified to be erected adjacent to the Kowloon bound carriageway of the flyover to protect the NSR's at the building blocks located to the east of the flyover at Phase VI and Phase VII of Mei Foo Sun Chuen.
- 2.2.4.2 FSD has advised EPD earlier in other occasion that noise mitigation measures along Kwai Chung bound carriageway of the flyover were not acceptable because of their obstruction to the fire fighting and rescue operation at Blocks 9, 11, 17 21 and 23 in Phase I of Mei Foo Sun Chuen.
- 2.2.4.3 As pointed out in the comments of Regional Highway Engineer/Hong Kong Region, Highways Department in his letter ref. HH 63/50 (CE) dated 17/01/97 on the working paper on the Scoping Study on Existing Flyovers, the existing section of Kwai Chung Flyover adjacent to Mei Foo Sun Chuen is structurally not feasible to support the addition of a noise barrier. The noise barrier and the flyover should therefore be structurally independent from each other.