



香港聲學學會

Hong Kong Institute of Acoustics

Proposal on Noise Control Policy for Hong Kong Traffic Noise Problem

T.T.K. Ho^a, C.M. Mak^b, H.F. Chan^c

^a Hong Kong Institute of Acoustics, GPO Box 7261, Hong Kong

^b Hong Kong Polytechnic University, Hung Hom, Hong Kong

^c Hong Kong Institute of Acoustics, GPO Box 7261, Hong Kong

ABSTRACT

Hong Kong has a unique noise problem unparalleled by other metropolitan cities in the world. Hong Kong is sometimes labeled as one of the noisiest cities in the world. Hong Kong has made tremendous efforts to improve its noise environment with some success. However, major noise problems remain, partly because of the congested urban structure, and partly because of past neglect in noise planning in the 70's and earlier that cannot be resolved overnight. Traffic noise is the single most notorious noise source in Hong Kong, 80% of the population in Hong Kong are effected by road traffic noise to different extent. This paper presents the extent of the traffic noise problem and the current traffic noise policy in Hong Kong, it also discusses the problems encountered and concludes with HKIOA's proposed traffic noise control policy for further considerations.

1 INTRODUCTION

Hong Kong has a unique noise problem unparalleled by other metropolitan cities in the world, such as London and New York. With a habitable area of some 400 square km and an ever-increasing population, standing at 6.8 million in 2001, no wonder Hong Kong is sometime labeled as one of the noisiest cities in the world.

In the past two decades, Hong Kong has made tremendous efforts to improve its noise environment with some success. For example, the promulgation of the Hong Kong Planning Standards and Guidelines (HKPSG) in 1982 and its Environment Chapter in 1985 has paved a long way towards long-term noise planning in Hong Kong. Prior to this, inappropriate siting of noise sensitive buildings near major roadways, railroads and the airport has created severe noise problems with no immediate solutions. The enactment of the Noise Control Ordinance (NCO) in 1988 has laid down a mechanism to control noise. An obvious benefit from the NCO was the sharp reduction of construction noise that had affected the tranquility of many people at night and on many public holidays. The relocation of Kai Tak Airport was a milestone in the reduction of aircraft noise over a major portion of Kowloon. Prior to this era, it was estimated that over 380,000 people living within NEF 30 contours were exposed to excessive aircraft noise. With the new airport, it is estimated that only about 200 people are affected by noise from Chek Lap Kok at NEF 25 contour. The enactment of the Environmental Impact Assessment Ordinance (EIAO) in 1997 has further consolidated government's noise planning efforts, making it a statutory requirement for designated projects to comply with a set of noise standards. Prior to this, some of the noise standards, i.e. traffic noise

^a Email address: tomho@svsamford.com

^b Email address: becmmak@polyu.edu.hk

^c Email address: HF.Chan@cinotech.com.hk

standards, are simply guidelines subject to the willingness of project proponents to implement. Incidentally, the relocation of many manufacturing industries to the Guangdong province has taken much pressure off the existing and future noise sensitive developments in Tsuen Wan, Kwai Chung, Tsing Yi, and other industrial areas in Hong Kong.

However, major noise problems remain, partly because of the congested urban structure, the need to house and move around the ever-increasing population in the scarce land, and partly because of past neglect in noise planning in the 70's and earlier that cannot be resolved overnight.

There are a large number of noise sources that contribute to our noise environment, including transportation noise, fixed-source noise, and construction noise. But by far road traffic noise is the single most notorious noise source in Hong Kong since it has been estimated that over 80% of the population in Hong Kong are affected by road traffic noise to different extent. While NCO can be applied to control fixed-source noise and construction noise, there is no similar legislation that can be applied to control road traffic noise, apart from a minor control over noise emission levels on first registration.

While worldwide acousticians and government officials recognize that traffic noise is not amenable through legislation, past experience has shown that the best way to control road traffic noise is through proper noise planning. The overriding importance of policy against road traffic noise has urged the Hong Kong Institute of Acoustics (HKIOA) to set up Working Groups to gather updated information on the concerned topics and from similar cities in Asia and Europe that would be applicable in the Hong Kong context with a view to formulating a noise control policy strategy for consideration to the Government.

2 EXTENT OF CURRENT TRAFFIC NOISE PROBLEM

Traffic noise is a major concern to people in Hong Kong. According to Government statistics, about 1.1 million of people are still exposed to high traffic noise levels [or noise levels in excess of the HKPSG criteria which is 70 dB(A) L10(1h)], making it the biggest and the most complex noise problem in Hong Kong. Typical problems faced by Hong Kong people are:

- a. Close proximity of major roads to dwellings - Many existing roads were built within 20-30 metres and some even within metres of the windows of high rise residential buildings. Tsing Fung Street flyover and East Kowloon Corridor are some of the notorious examples.
- b. Close proximity of major residential developments to existing roads - Many high-rise residential buildings were built within short distances to existing roads. As the demand for traffic increased in the past two decades, these roads carry more traffic than they were planned, with the results that these buildings are exposed to high traffic noise levels with no immediate noise mitigation solutions. Examples are Public housing in Aldrich Bay and East Harbor Tunnel Portal.
- c. Urban canyon - Urban streets lined with "canyons" of high-rises make the noise reverberant. Examples are Nathan Road and Hennessy Road.
- d. Through traffic in middle of major residential developments - Major roads carrying a high percentage of heavy vehicles run through major residential developments (i.e. enroute but not serving the area). Examples are Trunk Road T3.
- e. Heavy vehicles running in late evening or early morning hours - Flyovers carrying traffic with a high percentage of heavy vehicles run within close distances to windows of residential dwellings in late evening hours or in the early morning hours. Examples are Tai Kok Tsui Road flyover and West Kowloon Corridor.

People in Hong Kong have become impatient with high traffic noise. In the past 5 years, Environmental Protection Department received an average of some 400 complaints each year. Road traffic noise issues have been raised in the Legislative Council, the district councils and the media.

The situation is expected to get worse if development trends continue. The Strategic Environmental Assessment in the Third Comprehensive Transport Study completed in 1999 has predicted that by 2016, there could be 50% increase in population exposed to excessive traffic noise, as compared with the situation in 1997 and the exposure period would be prolonged and excessive traffic noise would intrude from early in the morning to night-time hours. The latest review indicates a possible improvement but there could still be some 10% increase in population exposed to excessive traffic noise around 2016. A comprehensive action plan is therefore required to prevent worsening of the situation and improve the noise environment.

3 CURRENT TRAFFIC NOISE CONTROL POLICY IN HONG KONG

The Government's overall policy objectives for road traffic noise control are to ensure that a satisfactory noise environment is attained and maintained in order to safeguard better quality of life for the public, and to protect people against excessive road traffic noise.

When planning new roads, or projects involving substantial widening of existing roads, the relevant government department or developer must ensure that traffic noise at residential flats will stay within the noise standard. It is the Government's policy since 1989 that, as a general principle, direct technical remedies should be applied, wherever practicable, where people are adversely affected by the use of a new road. Also, the Environmental Impact Assessment Ordinance (EIAO), which came into operation in 1998, requires all major new roads or road modifications to meet the traffic noise standard.

To address noise impact from existing roads, the Government introduced in November 2000 a policy to implement engineering solutions by way of retrofitting of barriers and enclosures, and resurfacing with low noise material, where practicable, at existing excessively noisy roads. Where engineering solutions are impracticable or where engineering solutions alone are inadequate in reducing the noise to a level below the noise limits, traffic management schemes would be explored where practicable on a case by case basis.

The Government has been tackling the road traffic noise problems through a 4-pronged approach:

- (a) Prevent noise problems through actions at the outset of land use planning and project design whenever practicable;
- (b) Avoid importing noisy vehicles into Hong Kong through legislation;
- (c) Address the existing traffic noise problems through abatement programmes; and
- (d) Getting the public and other stakeholders involved through education, engagement and partnership programme.

4 PROBLEMS ENCOUNTERED WITH CURRENT TRAFFIC NOISE POLICY

The problem with road traffic noise in Hong Kong is primarily due to the rapid proliferation and growth of traffic in a limited land area for an ever-expanding population. The lack of noise planning in the 70's and earlier resulted in major problems today. In the past three decades, the growing need to house and move around the ever-increasing population further exacerbated the problems. In spite of efforts made in the last two decades to abate noise, problems remain because there are limited noise mitigation measures available and restrictive at times. For example, while it is possible to introduce new noise planning concept into the redevelopment of old residential areas, this may take long time to

materialize because the areas are simply not to be redeveloped in ten to twenty years for one reason or the other. Some of the major problems in current traffic noise policy are examined below:

4.1 Vehicle Noise Emission Control

The current legislative control does not require the owners to maintain vehicles in noise emission to the ex-factory condition. Improper maintenance may increase the noise emission level by 2dB(A) or more.

4.2 Planning New Roads

Even though preventive actions are taken at the outset when planning new roads and noise sensitive developments, planning at project level only is not adequate to pre-empt noise problems and to ensure a good acoustic environment for the roadside receivers.

Despite the need under the EIAO to undertake an EIA as part of the feasibility or investigation study of a new highway, noise might not be a prime factor in the early planning stage of a highway. The mentality appears to be that engineering feasibility and cost of construction are more important, while any noise issue can be dealt with at the detailed design stage and there is always a technical solution to any noise problem no matter how a highway runs. Very often, questions such as those below are not given due and careful considerations at the planning stage:

- (a) Should other alignment options that would minimize noise pollution to nearby residential developments be given more consideration?
- (b) Is the new road at question the only option to move people and goods around? and;
- (c) Would building the new road cause noise pollution to but without necessarily benefiting some residents who are living next to the road with no frontal access?

Time and time again, however the above mentality was proved to be wrong given the many constraints encountered in Hong Kong, i.e. access for fire fighting, sightline requirements for road users, local topography, etc. While mitigation measures such as roadside barriers or covers can be explored under the current EIA process, these measures may not be practicable or buildable or may need to be significantly curtailed due to topographical or other constraints. Also, options for adopting alternative road alignment, alternative land use arrangements and even alternative mode of transportation are often very restricted. It may even be “too late” when it comes to the project level planning.

Even if noise barriers can be installed, there are many people who would think that noise should be controlled at source by running quieter vehicles or laying low-noise surfacing materials or through traffic management, rather than using a noise barrier which can be an eyesore.

At the end, residents living along the new road have to suffer. After all, project level EIA is not the panacea to traffic noise problems or, indeed, the overall environmental issues.

4.3 Planning New Residential Buildings

In the congested urban environment of Hong Kong, there is very often very limited scope for mitigating the noise within the site boundary of a residential development. In order to meet the noise standard, many residential developments adopted a single aspect building design to address traffic noise impacts. For example, some public housing developments located their corridors or kitchens on the side of busy roads as part of the noise mitigation measure. As fluorescent lights are often used in the corridors, these buildings look like hanging up many fluorescent lights on the facade. Not only does it affect the aesthetics of the design, it also affects the landscape and urban form of the city.

On the other hand, there are many situations where high-class residential developments in scenic locations were advised to orientate their sitting rooms and bedrooms away from the scenic side in

order to comply with the noise standard.

In reality, the prime considerations of the general public are likely to be:

- (a) Price/Re-sell value;
- (b) Facilities, e.g. shopping centre, entertainment, restaurants, etc.;
- (c) Building design, features and workmanship;
- (d) Convenience, e.g. ease accessible by public transportation;
- (e) View, i.e. sea view, mountain view, scenic area, etc.;
- (f) Environment, e.g. noise, air quality, hygiene, etc.

Given these considerations, it would appear that at least to some people “noise” is a concern only when other factors are equal.

4.4 Noise Abatement Works to Right the Past Neglects

Even though there is a programme to retrofit the problematic roads with noise barriers, only some 30 roads out of about 655 roads are amendable for retroactive noise mitigation measures because of various constraints. The Government should further explore other engineering and non-engineering options like the application of low noise road surfacing on urban roads and traffic management scheme.

Low noise road surfacing had been applied on high-speed roads where applicable in terms of engineering. Oversea studies have shown that special form of low noise road surfacing like double layer and stone mastic asphalt could be applied to low speed or urban roads offering 2 – 3dB(A) reduction.

Traffic management schemes have been widely applied in overseas for reducing traffic noise. The schemes are more restrictive in residential areas in that heavy vehicles or vehicles that need not going into residential areas would be banned during sensitive hours. This helps to provide a more preferred quiet environmental at nighttime.

4.5 Noise Standards

According to the EIAO-TM or HKPSG, the road traffic noise standard for new dwellings is 70 dB(A) L10(1-hr) during the peak hour traffic. There are no specific requirements and standards for quiet residential areas, rural areas and Country Parks where the existing noise environment is good and where the public would surely like to preserve its environmental quality. Furthermore, there is no noise standard for the nighttime which is required to protect people from noise disturbance at night. In a stressful society like Hong Kong, a quiet environment for sleep should be a priority

The problem is that the daytime noise level may not directly relate to the noise level at night. It may be argued that if the traffic flow pattern is similar throughout the day, the nighttime traffic noise would somehow be related to the daytime traffic noise. In many occasions, this is not the case and there could be a higher percentage of heavy vehicles during the nighttime than in the daytime.

It is ironical to note that there are some residents living close to new roads who complain about the noise even though an EIA has been undertaken for these new roads and all the noise concerns should have been taken care of during the EIA process using the 70 dB(A) standard. A careful analysis of the noise problem shows that the main objections are the noise from the pass-by of heavy vehicles, vehicles passing over road joints or bumps, and start-stop noise during the nighttime. Clearly, the current noise standard cannot take into account these elements and noise problems exist in spite of millions and millions of dollars being spent on noise mitigation measures.

4.6 Sustainable Transport Policy

Hong Kong lacks a sustainable transport policy. Main problems are the rapid growth in numbers and use of heavy vehicles as demonstrated in “The Third Comprehensive Transport Study” which looked into various transport development scenarios that would be necessary to support Hong Kong’s economic growth.

As part of the study, a strategic environmental assessment was carried out to examine the noise exposure of people due to various transport scenarios. The assessment examined a sample of 200 selected roads out of some 3000 roads in the territory and took year 1997 as the baseline. Results indicate that 440,000 people would be exposed to high traffic noise in the year 1997 due to the sampled 200 roads. With 3000 roads in the territory, it is anticipated that there would be some 1 million people exposed to high level traffic noise. The assessment further shows that the traffic situation by 2016, with no restraint on the growth in traffic, could lead to as much as 50% increase of population (i.e. from 1 to 1.5 million people) being exposed to excessive traffic noise as compared with the situation in 1997.

The rail system in Hong Kong is unique in that it has among the highest ridership in the world. However, when comparing the route maps of the rail system in Hong Kong with those in other major underground systems around the world (including those commonly cited as “world cities”, such as London, Paris, New York or Tokyo), the rail map of HK is skeletal whilst others show a complex set of lines with extensive coverage. This situation arises mainly because rail operators are required to justify on financially grounds whether a rail line should be constructed and this self-financing policy virtually prohibits any major expansion of the passenger rail system even though the CTS-3 recommends adopting railway as the backbone of the future passenger transport network in Hong Kong.

4.7 Cost-Effective Analysis in Planning New roads

According to the EIAO-TM and study brief of a traffic noise impact assessment, the project proponent is required to demonstrate that all practicable direct noise mitigation measures including alternative sites, alternative land uses, alignments, building disposition, barriers, podium, deck-over, etc. have been explored, and only under exceptional circumstances, indirect noise mitigation measures in the form of acoustical insulation and air conditioning system would be considered as a last resort.

The effectiveness of any barriers or enclosures is evaluated by considering whether there is more than 1 dB noise reduction at NSR provided by the barrier, even though the existing noise levels may be well over 70 dB(A). As there is no cost benefit analysis included in the assessment, the proposed direct mitigation measures may turn out to be very expensive with only limited noise benefit for a very small number of dwellings. It is anticipated that if the current planning mechanism is not abated, there will be more and more barriers along the roads in order to fulfill the planning requirements, and very soon Hong Kong will become a city of tunnels and barriers.

From a policy perspective, this is simple and clear-cut as focus is placed only on planning and building a new road in isolation. However, it is doubtful if the resources are well spent. The recent protest against Route 5 and Tolo Highway near HKSIP are good examples.

4.8 Environmental Impact Assessment Ordinance

Under the EIAO, project proponents have to conduct Environmental Monitoring and Audit to ensure noise mitigation measures as recommended in the EIA study are effective. However, such monitoring and audit does not cover the situation of “what if”. For example, what if the actual traffic flow exceeds the traffic forecast substantially? There is no mechanism to require the project proponent to implement additional measures to bring the noise level down. Another example is that what if the recommended measures are not capable to reduce noise as said in EIA reports? There is no mechanism or provision to require the project proponents to audit such situation and implement additional measures.

4.9 The responsibility of reducing road traffic noise is unclear. Should it be the job of EPD or the road project proponent or Transport and Housing Bureau?

No doubt, providing a good acoustical environment for the general public is the job for the entire Hong Kong SAR Government. In some specific areas like establishing traffic noise criteria, technical memorandum etc., it is very clear that the policy Secretary (Secretary for the Environment, SEN) would seek advice and views from EPD who in turn would collate international experience and practice and benchmark the local against the overseas. Whether to further tightening the criteria or introducing more aggressive control of traffic noise is clearly within the ambit of the Secretary of Transport and Housing. However, when it comes to implementation of mitigation measures, no particular authority appears to be responsible for the effectiveness of the measures so provided. (“when looking at project level, regional level or even strategic level, it is very unclear” appears to be unrelated to the examples below). For a road project undergoing an EIA, the road project proponent would commission a consultant to study the entire scheme for meeting the criteria or standards laid down in the EIAO TM. The consultant would come up with traffic forecast, road alignment, barrier design etc to meet the EIAO TM. However, upon completion of the project if the traffic forecast is found to be under-estimated or barriers are badly designed to the extent that the residents nearby are affected by traffic noise at levels higher than those predicted earlier, should the road proponent be penalized or the Transport Bureau who looks after the traffic forecast be responsible for the discrepancy? This is an area to be looked into and the responsibility be clearly laid down for the advocate of accountability.

5 CONCLUSIONS: PROPOSE TRAFFIC NOISE POLICY

5.1 Continuation of current policy

The 4-prong approach has laid the foundation for controlling traffic noise. In spite of the drawbacks or deficiencies as identified in foregone sections, the HKIOA is of the view that the approach and concept are in the right trend and track and should be continued.

Good planning paves a long way towards noise amelioration. Having reviewed the existing noise problems, current noise planning mechanism, and overseas experiences in noise planning for road traffic noise, it is clear that there is no single solution to this intriguing but complex noise problem in Hong Kong. Nevertheless, a balanced, integrated and proactive action plan is needed for policy makers and the planners to improve the current situation. The HKIOA is pleased to present the following views and recommendations aiming at a balanced approach to strengthen and improve the effectiveness the existing traffic noise policy for consideration by the Government. The recommendations could be categorized into hierarchical structure like policy aspect, institutional set-up and administrative arrangement.

5.2 Revamp of Policy

5.2.1 Noise Zoning

In order to preserve the environmental quality where it is good (in line with the EU directive), while allowing a noisier environment near busy road network, the HKIOA proposes a noise zoning in land use planning as below:

- (a) Zone A – Rural Area and Special Quiet Zone (such as in Sai Kung and Lantau South) & Country Parks
1. L_{10} 60 dB(A) during the daytime and no exceedance would be accepted;
 2. Roads should be either depressed or in tunnels;
 3. Alternative forms of transportation such as trams or trolley bus should be considered in any new development in the zone;
 4. No heavy vehicular traffic during the night is allowed;
 5. No through traffic is permitted and limited access by road traffic is provided; and
 6. A nighttime noise standard is imposed.

- (b) Zone B - Residential Zone
1. L_{10} 65 dB(A) during the daytime and no exceedance would be accepted;
 2. Roads should be either depressed or in tunnels;
 3. Alternative forms of transportation such as trams or trolley bus should be considered in any new development in the zone;
 4. No heavy vehicular traffic during the night is allowed;
 5. No through traffic is permitted and limited access by road traffic is provided; and
 6. A nighttime noise standard is imposed.
- (c) Zone C - Urban zone
1. L_{10} 70 dB(A) during the daytime and exceedance may be permitted subject to approval of the Authority;
 2. A maximum higher limit value and preferred limit value would be prescribed;
 3. Indirect technical measures for noise would be acceptable;
 4. Access by road traffic is provided; and
 5. No nighttime noise standard is specified.
- (d) Zone D - Mixed Residential Zone (I/R interface, near major traffic junctions or interchange)
1. L_{10} 75 dB(A) during the daytime and exceedance may be permitted subject to the approval of the Authority;
 2. A maximum higher limit value and preferred limit value would be prescribed;
 3. Indirect technical measures would be acceptable;
 4. Access by road traffic is provided; and
 5. No nighttime noise standard is specified.
- (e) Zone E - Residential Uses within Commercial & Industrial Areas
1. L_{10} 75 dB(A) during the daytime and exceedance may be permitted subject to the approval of the Authority;
 2. A maximum higher limit value and preferred limit value would be prescribed;
 3. Indirect technical measures would be acceptable;
 4. Access by road traffic is provided; and
 5. No nighttime noise standard is specified.

5.2.2 Integrated Transport Policy

Mass transit network should be considered in preference to roads. The mass transit network should be planned and developed before the full intake of population. Infrastructure facilities such as convenient lorry or container parks, shuttle service between parking areas and city centre should be provided if lorries are to be banned in some smaller roads in the residential areas during the night.

The CTS-3 has examined various means of reducing noise impact. In general, HKIOA concurs with some reservation on the proposed measures and their effectiveness as summarized in Table 1 below:

Table 1 - Alternative Noise Mitigation Measures and the Effectiveness [After CTS-3]

Mitigation Measures		Effectiveness
Type	Item	
Policy	More extensive network of rail service	Substantial
	Putting new roads underground	Substantial
	Pedestrianization	Medium
Engineering	More stringent vehicle noise emission standards	Medium
	Engine encapsulation for heavy vehicles	Medium
	Trolley Buses	Medium
Near or At Source	More extensive use of low noise surface	Medium
	Consideration of retrofitting existing roads	Medium
Management Possibilities	Traffic management on noise grounds	Substantial
	Speed regulation	Medium

However, it should be noted that it is unlikely that by implementing any single mitigation measure above in isolation the future noise problem can be fully addressed where fleet size keeps expanding and the needs for mobility are continuously surfacing. Administrative means should be considered to curb such increases. These may be in the form of fiscal, tax, demand management, quota or otherwise. The problem should be deliberated in the wider context of balancing economic development, transport and environmental needs and objectives. Further studies of alternative mitigation measures should be considered with the aim of producing additional information in the local context to assist policy makers to plan and formulate noise policies.

5.2.3 Integrated Approach in Land Use Planning

As recommended in CTS-3, an integrated approach should be adopted in developing transport infrastructure that takes into account land-use and environmental planning in order to minimize the need for travel. This entails that future population and employment centre should be placed in the vicinity of railway stations served by integrated pedestrian systems and other transport feeder services to maximize the usage of railways. Movements of commercial vehicles should also be planned to avoid concentrating traffic flows to some districts like the Central Business District.

5.2.4 Cost Benefit Analysis for Noise Mitigation Measures

On the basis of the experience in mitigating noise in Hong Kong, the Government should establish a databank for assessing whether the money to be spent on certain mitigation measures is in line with the economic status. For example, the Government has proposed for LegCo approval spending up to 15% of the contract sum on mitigating road traffic noise from three highways, including Trunk Road T3 in the form of noise barriers. A cost-benefit analysis should be carried out to establish a consensus view as to the cost the society is willing to shoulder and whether other forms of mitigation measures at a lower cost should be considered.

5.2.5 Control of in-use Noisy Vehicles

Apart from setting stringent noise emissions standards for vehicles on first registration, the Government should include noise test and appropriate noise performance standards as part of the

annual checking in order to eliminate noisy vehicles from using roads. This is particularly useful for in-use heavy vehicles and containers. New South Wales of Australia and Japan have been practicing this control of in-use vehicle emissions with success for some years.

5.3 Institutional Changes

5.3.1 Set up of Road Traffic Noise Commission

HKIOA has spent a year or so to study the traffic noise problem in Hong Kong including the extent of problem, the underlying problems and the causes of concerns. Meanwhile the HKIOA has also conducted extensive research of experiences and policies in overseas countries in order to draw on their experience and insight. We hope the above suggestions would provide useful materials for the Hong Kong SAR Government to further develop their works to bring down the traffic noise level in Hong Kong. We propose to set up an independent body, similar to Advisory Council for the Environment, to advise the Government on its policy, action plans and implementation of road traffic noise policy. Hong Kong Institute of Acoustics would continue to support and advise the Government on traffic noise policy.

5.3.2 Use of Noise Mapping Tools

In order to establish the baseline for decision makers to evaluate the effectiveness of a new noise policy, the Government should consider establishing a noise map for Hong Kong. With the aid of this Noise Map, it should be able to determine the overall noise exposure of the people and a decision may be made as to how the resources for noise amelioration should be apportioned – a “People Orientated Approach”.

5.3.3 Public Participation

One of the main emphases of the EU directive is on public participation by making available noise maps and information on the effect of noise. It is clear that there may not be any immediate practical solutions to resolve the traffic noise problems in the existing urban area without a major urban redevelopment process. As such, sufficient environmental noise information should be provided to the public so that people are made aware of the pros and cons, constraints and opportunities, and the rationale behind the current noise plans and policies and can make their own choice.

5.4 Administrative arrangement

5.4.1 Responsibility of Road Proponent

It is time to really think about the need to hold the road project proponent responsible for delivering what were originally predicted or assessed in the EIA, the traffic forecast, the alignment, and the effectiveness of the proposed barriers, the low noise road surfacing and other mitigation measures. The proposal in the Netherlands to have the motorway authority to guarantee the preservation of the maximum noise loads at the reference points is an example for Hong Kong to consider.

5.4.2 Rediverting traffic from noisy roads

Based on the experiences with retrofitting existing roads, the Government should consider building a new bypass, a depressed road or even a tunnel to divert the traffic from some noisy roads for which no immediate solution is available or the works would result in extensive and expensive noise barriers.

5.4.3 Traffic Management Scheme

As part of the overall noise reduction and abatement strategy, the Government should consider restricting heavy vehicle traffic in night time on certain roads which pass close to residential areas. At the same time, supporting infrastructure, such as adequate and convenient lorry or container parks, and special nighttime route for lorries and heavy vehicles for the movement of local supplies should be provided.

6 REFERENCES

- [1] Environmental Protection Department, "Environment Hong Kong 2000", 2000.
- [2] Planning Department, "Hong Kong Planning Standards and Guidelines"
- [3] Environmental Protection Department, "Streamlined Approach for the Planning of Residential Developments Against Road Traffic Noise, 1997
- [4] Environmental Protection Department, "Feasibility Study for Providing Retroactive Road Traffic Noise Mitigation Measures, 1996
- [5] Environmental Protection Department, "Feasibility Study for Providing Noise Mitigation Measures on Existing Flyovers", 1997
- [6] Environmental Protection Department, "A Concise Guide to the Noise Control Ordinance"
- [7] Environmental Protection Department, "Technical Memorandum for the Assessment of Noise from Places Other Than Domestic Premises, Public Places or Construction Sites"
- [8] Environmental Protection Department, "Technical Memorandum on Noise from Construction Work in Designated Areas"
- [9] Environmental Protection Department, "Technical Memorandum on Noise from Construction Work Other Than Percussive Piling"
- [10] Environmental Protection Department, "Technical Memorandum on Noise from Percussive Piling"
- [11] Environmental Protection Department, "Technical Memorandum of Environmental Impact Assessment Ordinance Process"
- [12] Web-site of HKSAR Government, www.info.gov.hk
- [13] Planning Department, "Hong Kong 2030: Planning, Vision and Strategy"
- [14] Draft Comprehensive Plan to tackle Road Traffic Noise in Hong Kong, 2006