

**For discussion
on 21 December 2004**

**LEGISLATIVE COUNCIL
PANEL ON ENVIRONMENTAL AFFAIRS**

Progress of Measures to Address Noise Impact of Existing Roads

PURPOSE

This paper updates Members on the progress of the noise mitigation measures for existing roads and seeks Members' advice on the way forward on implementing traffic management schemes as a means to mitigate nighttime traffic noise.

EXISTING POLICIES

2. On 15 December 2000, we briefed the Panel on Environmental Affairs of the Second Term of the Legislative Council on the following policy to address the noise impact of existing roads on residents in their neighbourhood –

- (a) engineering solutions, by way of retrofitting of barriers and enclosures, and resurfacing with low noise material, should be implemented where practicable at existing excessively noisy roads (i.e. roads generating traffic noise in excess of the noise limit of 70dB(A)L₁₀(1 hour)¹); and
- (b) non-engineering solutions, such as traffic management measures, should be explored on a case-by-case basis and implemented where practicable at roads where engineering solutions are impracticable or where engineering solutions alone are inadequate in reducing the noise to an acceptable level.

NOISE BARRIER RETROFIT PROGRAMME

3. Since the introduction of the above policy in 2000, the

¹ L₁₀(1 hour) is the noise level exceeded for 10% of an one-hour period, generally used for road noise at peak traffic flow.

Environmental Protection Department (EPD) and Highways Department (HyD) have been working together to identify suitable road sections for noise barrier retrofitting works. It is, however, possible to provide noise barriers at existing road sections/flyovers only if effective retrofitting works are technically feasible. For assessing the technical feasibility, the following criteria are being used –

- (a) the new structures will not obstruct emergency access or fire fighting;
- (b) they will not undermine road safety or impede pedestrian and vehicular movements;
- (c) they will not interfere with commercial activities or cause social disruptions; and
- (d) there will be adequate space and structural capability (applicable to flyovers) for supporting the barrier/enclosure.

4. So far, we have identified 36 existing road sections (including 6 flyovers) for which preliminary investigations have shown that retrofitting works are technically feasible. Of these 36 road sections, funds for the retrofitting works along the Fanling Highway sections near Choi Yuen Estate and Fanling Centre have already been approved by the Finance Committee and construction works commenced in August 2004. Funds for retrofitting works along 12 existing road sections have been earmarked. Funding approval will be sought in due course according to the progress of the detailed design and planning work. The total estimated cost for these 12 projects is about \$816 million. The remaining 22 existing sections are being examined in detail. Funding will be sought through the normal resources allocation mechanism under the public works programme, when the need for and technical feasibility of these retrofitting works are confirmed. A summary of these 36 road sections, classified according to their status under the public works programme, is at **Annex A**.

5. The total indicative cost of retrofitting the 36 road sections with noise barriers/enclosures is about \$2,450 million. Upon full implementation, the annual recurrent maintenance cost of the barriers/enclosures will be around \$12.6 million. About 28,000 dwellings will benefit from the retrofit programme with majority experiencing reduction in noise below the noise limit.

6. EPD and HyD will continue to review the need for and feasibility of retrofitting noise barriers on suitable existing road sections. Upon the

results of these reviews, more road sections may be added to the list in future.

LOW NOISE MATERIAL RESURFACING

7. It is now a standard government practice to pave high-speed roads/flyovers with a speed limit at 70km/hour or above with low noise surfacing material. The porous friction course of the material helps reduce the road/tyre interaction noise on high speed and low speed roads by up to 5 and 3 dB(A)(L10)(1hour) respectively. However, application of such material on low speed local roads is constrained by road geometry, as frequent start-stop movements and a high percentage of heavy vehicles will cause rapid wear and tear, resulting in an uneven road surface and the need for frequent resurfacing. This will result in higher maintenance costs, more traffic disruption and inconvenience to drivers, pedestrians and shop operators. Hence, it is necessary to select suitable road sections for surfacing with such material.

8. We have identified 72 existing road sections for further feasibility studies on their suitability to be resurfaced with low noise surfacing material. By end 2004, the resurfacing work for 11 of them will have been completed. Subject to availability of resources, the road resurfacing programme is scheduled to be completed by 2010. A tentative implementation timetable has been drawn up at **Annex B**. We estimate that the whole resurfacing programme will benefit about 40,000 residential units and cost about \$80 million.

B

TRAFFIC MANAGEMENT SCHEME

9. Since 2000, the Administration has studied the feasibility of several nighttime traffic management schemes to address the noise problem of the road sections concerned. At the meeting of the Joint Panels on Environmental Affairs and Transport on 19 July 2002, we reported that the traffic management scheme at East Kowloon Corridor was considered not viable in view of the anticipated substantial noise impact on the dwellings along the routes to which the traffic would be diverted. At the meeting of the Joint Panels on Environmental Affairs and Transport on 24 February 2003, Members further considered the subject and supported the Administration in conducting a trial traffic management scheme to ban vehicles from entering Texaco Road Flyover during the restriction hours.

10. There were strong oppositions from the goods vehicle, mini-bus and taxi trades against the trial scheme for Texaco Road Flyover. The outbreak

of SARS last year also caused a severe impact on the business of the transport trades. We therefore postponed the trial scheme in 2003 and revisited the trial this year. Subsequently we conducted a partial restriction banning franchised buses and cross-boundary buses from using this flyover from midnight to 6 a.m. for a month between 28 May and 27 June 2004. During the trial, about 80 buses per night, were diverted to use the at-grade Texaco Road as the alternative route.

11. According to measurements recorded at the East Asia Gardens and Wealthy Garden, the trial scheme did not have a significant mitigating effect on the overall traffic noise. The sporadic traffic noise caused by the passing buses was, however, reduced by at least 5dB (L_{max}) as the pass-by noise of buses along the at-grade Texaco Road was screened off by the podiums of the residential blocks. Details of the traffic volume and the noise measurement results are at Annex C.

12. One of the main limitations of using traffic management schemes as a noise mitigating measure is that it may shift the noise impact to other residents along the alternative routes. The transport trades will also raise strong objections to such schemes if alternative routes cause disruption to their businesses in terms of time and fuel costs. The potential to implement traffic management schemes as a means to mitigate road traffic noise is therefore limited. It is more practical to narrow down the scope to banning franchised buses and cross-boundary buses from using the selected road sections. That said, it is a worthwhile measure only if the buses using the alternative routes will not shift the noise impact to other residents.

13. Texaco Road Flyover is a practicable case where the pass-by noise of vehicles along the alternative at-grade Texaco Road will be screened off by the podiums of the residential blocks, and hence will not significantly shift the noise impact to other residents. We therefore propose to make it a regular arrangement to ban franchised buses and cross boundary buses from using the flyover from midnight to 6 a.m..

14. Subject to the views of Members, we will continue to explore places where the banning of franchised buses and cross boundary buses during nighttime will help reducing noise and will not shift the noise problem to other residents. We will consult the relevant District Councils for introducing similar arrangements when appropriate.

List of Retrofit Projects and Implementation Schedule

(as at December 2004)

Ref no.	Road Section	PWP Category	Tentative Schedule	
			Commencement	Completion
Group I - Funding has been approved by the Finance Committee (2 road sections)				
1	Fanling Highway (near Choi Yuen Estate) ¹	A	Aug 2004	Dec 2005
2	Fanling Highway (near Fanling Centre) ¹	A	Aug 2004	Dec 2005
Group II - Funding has been earmarked in Resources Allocation Exercise (12 road sections)				
3	Cheung Pei Shan Road ²	B (2004 RAE)	Jun 2005	Dec 2007
4	Ma On Shan Road ²	B (2004 RAE)	Oct 2005	Oct 2007
5	Yuen Shin Road (near Kwong Fuk Estate) ³	B (2004 RAE)	Aug 2006	Apr 2008
6	Tseung Kwan O Road (near Tsui Ping (South) Estate)	B (2004 RAE)	Dec 2007	Dec 2010
7	Tuen Mun Road (Tsuen Wan) ⁴	B (2003 RAE)	May 2006	Dec 2011
8	Tuen Mun Road (Sam Shing Hui) ⁴			
9	Tuen Mun Road (Tsing Lung Tau) ⁴			
10	Tuen Mun Road (Castle Peak Bay) ⁴	B (2003 RAE)	May 2006	Dec 2011
11	Tuen Mun Road (Anglers' Beach) ⁴			
12	Tuen Mun Road (Sham Tseng) ⁴			
13	Tuen Mun Road (Yau Kom Tau) ⁴			
14	Tsing Tsuen Bridge (Tsuen Wan and Tsing Yi)	B (2004 RAE)	Dec 2007	Dec 2010

¹ The noise barrier panels recovered from the Tolo Highway will be used on these two sections of Fanling Highway.

² Retrofitting works will be carried out by the Civil Engineering and Development Department to tie in with adjoining road works.

³ The noise barrier panels recovered from the Tolo Highway will be used on this section of Yuen Shin Road near Kwong Fuk Estate. In view of residents' concerns, the two sections of Yuen Shin Road, near Kwong Fuk Estate and near Fu Shin Estate have been resurfaced with low noise material on a trial basis. The low noise material surface will likely reduce the noise impact on Fu Shin Estate to only slightly above 70dB(A) and thus the need for retrofitting of noise barrier on this section concerned has to be further examined in consultation with the Tai Po District Council.

⁴ Retrofitting works for the seven sections of Tuen Mun Road will be implemented under 'PWP Item no. 746TH - Reconstruction and improvement of Tuen Mun Road' project.

Ref no.	Road Section	PWP Category	Tentative Schedule
Group III - Funding to be sought through Resources Allocation Exercise (7 road sections)			
15	Tseung Kwan O Road (near Hing Tin Estate)	C	Subject to the results of the detailed reviews, funding will be sought through the normal resources allocation mechanism under the public works programme.
16	Hoi On Road		
17	Tai Chung Kiu Road		
18	Che Kung Miu Road		
19	Po Lam Road North		
20	Hung Mui Kuk Road / Che Kung Miu Road		
21	Tin Sam Street		
Group IV – Not yet included in the public works programme (15 road sections)			
22	Fung Shue Wo Road (Tsing Yi Estate to Tsing King Road Roundabout)	N/A	Technical feasibility study being finalized.
23	Sha Tin Road		
24	Po Ning Road		
25	Shun Lee Tsuen Road		
26	Kwun Tong Bypass		
27	Yuen Wo Road		Technical feasibility study to commence in due course.
28	West Kowloon Corridor		
29	Heung Yip Road		
30	Ma Wang Road		
31	Sau Mau Ping Road		
32	Tai Po Road (Sham Shui Po)		
33	Chai Wan Road		
34	Castle Peak Road (Ping Shan)		
35	Castle Peak Road (Hung Shui Kiu)		
36	Ap Lei Chau Bridge (near Shan Ming Street)		

Low Noise Resurfacing Programme

(as at December 2004)

Road No	Road	From	To	Implementation Timetable
Phase I (24 sections)				
1	Pik Wan Road	Tak Shing House	Tak Shui House	Works completed.
2	Cox's Road	Austin Road	Jordan Road	Work has commenced for completion in 2005.
3	Fa Yuen Street	Prince Edward Road West	Boundary Street	Works completed.
4	Hing Wah Street	Cheung Sha Wan Road	Un Chau Street	Works completed.
5	Kimberley Road	Nathan Road	Observatory Road	Work has commenced for completion in 2005.
6	Mong Kok Road	Shanghai Street	Tong Mi Road	Works completed.
7	Nam Cheong Street	Cheung Sha Wan Road	Lai Chi Kok Road	Commencement delayed due to other works in the area. Works tentatively to complete by 2007/08.
8	Oak Street	Cherry Street	Ivy Street	Works completed.
9	Portland Street	Argyle Street	Waterloo Road	Commencement delayed due to other works in the area. Works tentatively to complete by 2007/08.
10	Public Square Street	Ferry Street	Canton Road	Works completed.
11	Reclamation Street	Public Square Street	Argyle Street	Commencement delayed due to other works in the area. Works tentatively to complete by 2007/08.
12	Sai Yee Street	Prince Edward Road West	Boundary Street	Works completed.
13	Un Chau Street	Hing Wah Street	Tonkin Street	Work has commenced for completion in 2005.
14	Waterloo Road	Ferry Street	Shanghai Street	Work tentatively to commence and complete in 2005.
15	Yen Chow Street	Hai Tan St	Lai Chi Kok Rd	Commencement delayed due to other works in the area. Works tentatively to complete by 2005/06.

Road No	Road	From	To	Implementation Timetable
16	Lai Chi Kok Road	Tonkin Street	Hing Wah Street	Technical feasibility under review.
17	Tonkin Street	Cheung Sha Wan Road	Un Chau Street	Works completed.
18	Shanghai Street	Public Square Street	Kansu Street	Technical feasibility under review.
19	Un Chau Street	Tonkin Street	Yen Chow Street	Work has commenced for completion in 2005.
20	Shanghai Street	Argyle Street	Dundas Street	Work tentatively to commence and complete in 2005.
21	Embankment Road	Prince Edward Road West	Boundary Street	Works completed.
22	Shek Kip Mei St	Tai Po Road	Woh Chai Street	Work has commenced for completion in 2005.
23	Tai Hang Tung Road	Tong Yam Street	Tat Chee Avenue	Work tentatively to commence and complete in 2005.
24	Yim Po Fong Street	Shantung Street	Waterloo Road	Works completed.
Phase II (22 sections)				
25	Aberdeen Main Road	Aberdeen Praya Road	Aberdeen Reservoir Road	Works tentatively to complete in 2007/08.
26	Connaught Road West	Des Voeux Road West	Water Street	Technical feasibility under review.
27	Electric Road	Gordon Road	Wing Hing Street (Tsing Fung Street)	Review to be finalized with parties concerned. Works tentatively to complete in 2008/09.
28	Java Road	Tong Shui Road	Tin Chiu Street	
29	King's Road	Healthy Street West	Java Road	
30	Kingston Street	Paterson Street	Gloucester Road	Works completed.
31	Lockhart Road	Arsenal Street	Percival Street	Review to be finalized with parties concerned. Works to complete in 2009/10.
32	Queen's Road West	Des Voeux Road West	Hill Road	Works tentatively to complete in 2005/06.
33	Whitty Stree	Des Voeux Road West	Queen's Road West	

Road No	Road	From	To	Implementation Timetable
34	Johnston Road	Luard Road	Fleming Road	Review to be finalized with parties concerned.
35	Wong Nai Chung Road	Sing Woo Road	Broadwood Road	Works tentatively to complete in 2007/08.
36	Queen's Road West	Western Street	Water Street	
37	Wong Nai Chung Road	Sports Road	Broadwood Road	
38	Hennessy Road	Fleming Road	Stewart Road	Works tentatively to complete in 2005/06.
39	Queen's Road East	Queensway	Kennedy Road	Review to be finalized with parties concerned.
40	Chi Kiang Street	To Kwa Wan Road	Ma Tau Wai Road	Works tentatively to complete in 2008/09.
41	Ma Tau Kok Road	Kowloon City Road	Ma Tau Chung Road	
42	Wuhu Street	Gillies Ave. South	Chatham Road North	Technical feasibility under review.
43	To Kwa Wan Road	Kwei Chow Street	Chi Kiang Street	To tie in with the adjoining road works to be carried out by KCRC. Works tentatively to complete in 2010.
44	To Kwa Wan Road	Mok Cheong Street	Ma Tau Kok Road	
45	Lomond Road	Argyle Street	Prince Edward Road	Works tentatively to commence and completion in 2005.
46	Nga Tsin Wai Road	Tak Ku Ling Road	Junction Road	Technical feasibility under review.
Phase III (New Territories East - 12 sections)				
47	Jockey Club Road	Po Shek Wu Rd	Man Kam To Road	Review study commenced in May 2004 for completion in June 2005. Funding for resurfacing will be sought depending on the review results.
48	Jockey Club Road	Lung Sum Avenue	San Fung Avenue	
49	Ma Sik Road	Jockey Club Road	Tin Ping Road	
50	Tai Po Tai Wo Road	On Cheung Road	Nam Wan Road	
51	Tai Po Tai Wo Road	Ting Kok Road	Ting Tai Road	
52	Nam Wan Road	Nga Wan Road	Pan Chung Road	
53	Shatin Rural Committee Road	Tai Po Road – Shatin Section	Yuen Wo Road	

Road No	Road	From	To	Implementation Timetable
54	Sha Tin Wai Road	Ngan Shing Street	Ngau Pei Sha Street	Review study commenced in May 2004 for completion in June 2005. Funding for resurfacing will be sought depending on the review results.
55	Sha Tin Wai Road	Sha Tin Road	Ngan Shing Street	
56	Tai Chung Kiu Road	Sha Kok Street	Sha Tin Wai Road	
57	Chiu Shun Road	Po Ning Road	Ngan O Road	
58	Chui Tin Street	Che Kung Miu Road	Cul-de-sac	
Phase III (New Territories West - 14 sections)				
59	Castle Peak Road	Tuen Mun Heung Sze Wui Road	Hing Ping Road	Review study commenced in May 2004 for completion in June 2005. Funding for resurfacing will be sought depending on the review results.
60	Castle Peak Road	Pui To Road	Tuen Mun Heung Sze Wui Road	
61	Tuen Mun Heung Sze Wui Road	Tuen Hing Road	Siu Lun Street	
62	Tuen Mun Heung Sze Wui Road	Siu Lun Street	Hoi Chu Road	
63	Wu Shan Road	Lung Mun Road	Wu King Road	
64	Long Ping Road	Fung Chi Road	Long Ping Road INT.	
65	Yuen Long Main Road	Tai Tong Road	Fung Cheung Road	
66	Yuen Long On Ning Road	Tai Kiu Road	Wang Chau Road	
67	Ma Miu Road	Yuen Long On Ning Road	Ma Wang Road	
68	Castle Peak Road	Ping Ha Road	Tin Ha Road	
69	Chung On Street	Sha Tsui Road	Yeung Uk Road	
70	Yeung Uk Road	Tai Ho Road	Chung On Street	
71	Kwai Foo Road	Kwai Chung Road	Hing Fong Road	
72	Kwai Yik Road	Kwai Chung Road	Hing Fong Road	

Trial Traffic Management Scheme at Texaco Road Flyover

Noise Assessment Results

Locations for noise measurements

- Four measurement locations were set up on 4/F and 14/F of East Asia Gardens and 1/F and 10/F of Wang Wah Building to measure the noise levels in L10(1 hour).
- An additional measurement was established on 4/F, Tai Fat House of East Asia Gardens to assess the maximum pass-by noise levels from the heavy vehicles running on Texaco Road Flyover.

Measurement results

Measured L10(1 hour) noise levels

- Measurement results at the four locations before and during the trial scheme are given below –

Measurement Locations	Noise level (dB(A))(L10) (1 hour))	
	Before trial	During trial
4/F, East Asia Gardens	68 - 71	68 - 72
14/F, East Asia Gardens	69 - 72	68 - 72
1/F Wang Wah Building	71 - 76	71 - 76
10/F, Wang Wah Building	70 - 74	69 - 74

Reduction of pass-by noise of heavy vehicles (measured in Lmax)

- There are about 480 heavy vehicles (including goods vehicles and buses) running on Texaco Road Flyover during the nighttime period (from midnight to 6:00 am). With the trial traffic management scheme, the number of heavy vehicles passing through the Texaco Road Flyover was reduced by about 80 (i.e. about a reduction of 17% in the heavy vehicle flow).

- Details on the volume of traffic without the trial banning on the flyover are given below -

Time	Southbound					
	Taxi	Goods Vehicle	Franchised Bus	Non-franchised Bus	Others	Total
12:00 – 1:00a.m.	111	24	18	3	139	295
1:00 – 2:00a.m.	67	21	3	0	80	171
2:00 – 3:00a.m.	64	9	1	0	75	149
3:00 – 4:00a.m.	52	32	0	0	40	124
4:00 – 5:00a.m.	58	25	1	0	55	139
5:00 – 6:00a.m.	77	15	7	0	54	153
Total	429	126	30	3	443	1031

Time	Northbound					
	Taxi	Goods Vehicle	Franchised Bus	Non-franchised Bus	Others	Total
12:00 – 1:00a.m.	90	79	26	0	155	350
1:00 – 2:00a.m.	94	62	8	0	121	285
2:00 – 3:00a.m.	72	35	2	0	76	185
3:00 – 4:00a.m.	64	32	0	0	47	143
4:00 – 5:00a.m.	52	27	7	0	23	109
5:00 – 6:00a.m.	64	35	5	0	37	141
Total	436	270	48	0	459	1213

- The reductions in maximum pass-by noise at 4/F, East Asia Gardens for some types of vehicles are –

Types of vehicles	Lmax(dB(A)) for vehicles using flyover	Lmax(dB(A)) for vehicles using at-grade road	Difference in Lmax(dB(A))
Franchised bus	73.9	67.2	- 6.7
Heavy vehicle	76.1	69.5	- 6.6
Light vehicle	71.7	64.2	- 7.5
Taxi	68.5	63.0	- 5.5

Impact on travelling distance and time

- The travelling distances for the flyover route and the ground level route are virtually the same i.e. 720m. Since there are traffic light signals on the at-grade Texaco Road, the journey time is longer than using the flyover. The observed travelling times are -

Direction	Travelling time	
	Flyover route	Ground level route
Southbound	105 seconds	130 seconds
Northbound	100 seconds	120 seconds

(Note: Texaco Road has a speed limit of 50km/h.)