

**For information
on 19 July 2002**

**LEGISLATIVE COUNCIL
PANELS ON ENVIRONMENTAL AFFAIRS AND TRANSPORT**

Traffic Management Schemes

INTRODUCTION

The Administration proposes to study the feasibility of the following night-time traffic management schemes to address the noise problem of the road sections concerned –

- (a) full closure of East Kowloon Corridor;
- (b) full closure of Kwai Chung Road Flyover outside Kwai Fong Estate;
- (c) full closure of Texaco Road Flyover in Tsuen Wan; and
- (d) banning of goods vehicles over 5.5 tonnes along Ngan Shing Street in Shatin.

2. At the meeting of the Joint Panels on Environmental Affairs and Transport held on 18 June 2002, Members requested the Administration to provide further information on the following –

- (a) sustainability assessment and economic impact assessment of the proposed trial schemes;
- (b) traffic impact assessment of the proposed trial schemes including existing traffic flow, shift in traffic pattern and forecast traffic conditions at individual signal-controlled road junctions along the alternative routes upon implementation of the proposed trial schemes;
- (c) background noise levels along the concerned flyover/road section,

and the ground level roads underneath the concerned flyovers/alternative routes before and after the implementation of the proposed trial schemes including the number of affected dwellings;

- (d) update on the implementation of the low noise resurfacing programme including improvement to expansion joints for the concerned flyovers/road section;
- (e) feasibility of erecting noise barriers on the concerned flyovers/road section;
- (f) provision of air-conditioning and double-glazed windows to the affected dwellings along the concerned flyovers/road section;
- (g) assessment criteria in determining whether full closure of the concerned flyovers at night-time should be adopted as a permanent measure; and
- (h) breakdown of the forecast improvement to traffic noise problems, and the shift in traffic pattern and associated traffic impact if different types of vehicles are banned from entering the concerned flyovers at night-time.

This paper provides the Administration's response to the above.

SUSTAINABILITY ASSESSMENT AND ECONOMIC IMPACT ASSESSMENT

3. We have qualitatively looked into the sustainability and economic impact of the proposed schemes. More time and data would be required if detailed assessments were to be conducted. On the environmental front, it is anticipated that there would be an overall decrease in night-time noise levels at the dwellings along the road sections concerned. There would not be significant changes in the air quality of the areas concerned due to the implementation of the proposed schemes.

4. The economic impact of the proposed schemes at Kwai Chung Road

Flyover, Texaco Road Flyover and Ngan Shing Street would be insignificant because the additional travelling distance and time involved would be less than 0.5km and 70 seconds respectively. We consider it worthwhile to pursue these proposed trials due to the overall noise benefit the management schemes are expected to bring about and the insignificant transport and economic impacts.

5. As for the proposed scheme at East Kowloon Corridor, the additional travelling distance and time is about 2.4km and 5.5 minutes for eastbound journeys and 0.35 km and 1 minute for westbound journeys respectively. This may lead to additional fuel consumption for motorists and additional fares for taxi passengers when the scheme is in effect, i.e. between 1 to 5:30 am. On the environmental front, there could be a noise reduction of about 2 to 9 dB(A) at some 2,600 dwellings above the flyover but some 8,600 dwellings along the diverted routes could experience an increase of noise level of 1 to 7 dB(A). In view of the substantial noise impact on the dwellings along the diverted routes, we suggest to defer the proposed scheme until the relevant departments are able to devise a scheme that could satisfactorily alleviate the noise impact on those dwellings.

TRAFFIC IMPACT ASSESSMENT

6. The Administration has conducted traffic impact assessments for the 4 proposed schemes. Details are set out in Appendix A. The assessments have shown that alternative routes have sufficient capacity to cope with the diverted traffic from the concerned flyovers/road section during the closure period. The Transport Department will closely monitor the situation and make necessary adjustment to the traffic signals to ensure that the traffic on the diverted routes would not be unduly delayed.

NOISE IMPACT ASSESSMENT

7. We have assessed the potential traffic noise impacts at the four concerned flyovers/road section. A summary of the predicted noise levels and the number of dwellings affected along the routes are given in Appendix B.

8. In general, there would be reduction in traffic noise to the dwellings

along the concerned flyovers/road section. With the implementation of the proposed schemes, residents along the concerned flyovers/road section would benefit from noise reduction of up to 9 dB(A). But there are residents along the diverted routes that would experience an increase in noise levels.

9. At East Kowloon Corridor, there could be a noise reduction of 2 to 9 dB(A) at some 2,600 dwellings above the flyover along Kowloon City Road and Chatham Road. About 8,600 dwellings along the diverted routes such as Ma Tau Wai Road, To Kwa Wan Road and Ha Heung Road etc. could experience an increase of noise level of 1 to 7 dB(A).

10. The Kwai Chung Road Flyover and Texaco Road Flyovers were built along the middle of the road reserve with two carriageways on either side. There are screening structures like podium, commercial center and slope etc. between the residential buildings and the ground level carriageways. The flyovers themselves also provide screening effect. Therefore, when the traffic is diverted from the flyovers to the ground level, noise level at dwellings above the flyovers would decrease. Since the traffic is not diverted to other roads, no other dwellings would be affected. For both schemes, there would be approximately 2,600 dwellings benefiting from up to 3 dB(A) of noise reduction while some 40 dwellings below the flyover decks might be subject to an increase of about 2 to 3 dB(A) due to the diverted traffic.

11. Ngan Shing Street is the main road serving CityOne Shatin with a number of bus routes passing through. There is a bus terminus in the vicinity and bus operation dominates the noise levels there. The environment would become quieter after the operation hours of the bus service. The proposed scheme of banning heavy vehicles from the street will alleviate noise problems at the dwellings during the restricted hours.

ROAD SURFACE CONDITIONS

12. Since 1990, the Administration has resurfaced a number of existing high-speed roads with low noise material. The programme was completed in 1999 with a total of over 11km long carriageway including East Kowloon Corridor being resurfaced with low noise material. It is now a standard to pave new high-speed roads with noise reducing surfacing. According to records of

the Highways Department, 1,420 km out of the 1,909 km of roads in the Territory are paved with bituminous materials (flexible and low noise) and the remaining 489 km is paved with concrete.

13. Under the new noise policy endorsed by the Executive Council in 2000, the Administration has so far identified 72 sections of low-speed road (i.e. speed limit at 50 kph) to be resurfaced with low noise material. Resurfacing works will be carried out in 3 phases. Detailed design of the first phase has commenced already. According to the current programme, the resurfacing works for all 72 road sections would be completed by end of 2004. It should be noted that resurfacing of low noise material is found to be not practicable at Kwai Chung Road Flyover, Texaco Road Flyover and Ngan Shing Street as they are frequently used by heavy vehicles like container trucks and buses in the daytime. Low noise material would be eroded very quickly and are thus not effective. Nevertheless, flexible bituminous surfacing, which also has noise reducing effect, has been used to pave these flyovers/road section.

14. For the expansion joints on the flyovers, the Highways Department will monitor the condition of the joints on the flyover and will carry out maintenance works when necessary. This will help to alleviate the noise arising from vehicles passing over these joints.

FEASIBILITY OF ERECTING BARRIERS

15. Erection of noise barriers at existing road sections/flyovers will only be considered technically feasible if these four principles are satisfied :

- (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.

16. The Administration has explored the feasibility of erecting barriers at the concerned flyovers/road section and found that none of them were technically feasible. It is mainly due to insufficient space and the lack of spare loading capacity for the flyovers to take up extra loading from the noise barriers. Details of the practical constraints are set out in Appendix C.

PROVISION OF AIR-CONDITIONING AND DOUBLE-GLAZED WINDOWS

17. We believe mitigating the noise problems at source would be more cost-effective. The provision of air-conditioning and double-glazed windows to the affected dwellings is passive and very costly. There are approximately 7,000 dwellings along the concerned flyovers/road section. If they were to be provided with air-conditioning and double-glazed windows, the capital cost would be around \$ 350 million assuming an average cost of \$50,000 per residential unit, without counting recurrent and replacement expenditure. Also, it would not be fair to provide noise insulation to some buildings but not others. With a total of approximately 300,000 dwellings affected by excessive traffic noise, the liability on public purse to provide insulation would be at least \$ 15 billion. For road sections where mitigation at source (e.g. by means of retrofitting with barriers and resurfacing with low noise material) is not technically feasible, the implementation of traffic management schemes is one practical solution.

CRITERIA FOR PERMANENT IMPLEMENTATION OF TRAFFIC MANAGEMENT MEASURE

18. The Administration would decide on whether to implement long-term traffic management schemes after results from the trials are collected and analysed. It is therefore essential to carry out the proposed trials in order to ascertain the actual effectiveness of the schemes. When considering whether to implement long-term traffic management schemes, we will take into account various factors including the change in noise level at the road sections concerned, number of dwellings benefited/affected, traffic impact, public views including those from Members, local residents, the transport trades and District Councils.

CHANGE IN TRAFFIC PATTERN AND NOISE IMPACT IF DIFFERENT TYPES OF VEHICLES ARE RESTRICTED

19. With the full closure of the Kwai Chung Road Flyover and Texaco Road Flyover, vehicles will be diverted to ground level roads on both sides of the flyovers. There is virtually no change in their traffic pattern except that vehicles may have to stop at traffic signal junctions on the ground level roads. Full closure of these two flyovers would result in noise reduction by 1 to 3 dB(A). If only heavy vehicles are restricted, the maximum noise benefit would be reduced to around 1 to 2 dB(A).

20. For East Kowloon Corridor, the percentage of heavy vehicles using the flyover is about 10% of the total traffic flow. If only heavy vehicles are restricted, the noise benefit to the residents along East Kowloon Corridor would be much less (around 1dB(A)) when compared to noise reduction of 2 to 9 dB(A) during full closure.

TRAFFIC IMPACT ASSESSMENT

A. East Kowloon Corridor (EKC)

Under the proposed traffic management (TM) scheme, EKC will be closed to all vehicles from 1:00am to 5:30am daily.

1. Alternative Routes

When EKC is closed, alternative routes for eastbound traffic from Chatham Road North and Kowloon east districts are:

Alternative **Eastbound** route to Kowloon east districts (Figure 1)
Chatham Road North -- Ma Tau Wai Road -- Ma Tau Chung Road -- Prince Edward Road East -- Kwun Tong Road/or the slip road to Kwun Tong Bypass

For westbound traffic exiting from the Airport Tunnel, alternative routes for reaching Chatham Road North are:

Alternative **Westbound** route to Chatham Road North (Figure 1)
Airport Tunnel portal -- San Shan Road -- To Kwa Wan Road -- Ma Tau Wai Road -- Gillies Avenue North -- Hok Yuen Street -- Chatham Road North

2. Traffic Assessment

Traffic Counts

The present traffic flow along EKC on a normal weekday is shown below.

Existing traffic flow along EKC

	Eastbound (Kwun Tong direction)				Westbound (Tsim Sha Tsui direction)			
	Taxi	Goods Vehicle	Others	Total	Taxi	Goods Vehicle	Others	Total
1am-2am	491	45	517	1,053	433	43	228	704
2am-3am	514	46	234	794	313	33	87	433
3am-4am	430	55	239	724	240	58	38	336
4am-5am	358	58	228	644	179	55	55	289
5am-5:30am	165	50	117	332	84	34	84	202

Travelling Distance and Time

Actual travelling time along EKC and the alternative routes between points A, B and C (Fig. 1) from 1am to 2am have been recorded.

Travelling Distance & Time via EKC and via Alternative Routes from 1am to 2am

		Travelling Distance (km)	No. of Signal Junctions Negotiated	Travelling Time
From A to B (eastbound)	via EKC	6.48	1	6 min 12 sec
	with TM Scheme	8.53	10	11 min 55 sec
From B to A (westbound)	via EKC	6.48	1	6 min 41 sec
	with TM Scheme	6.82	9	7 min 31 sec
From A to C (eastbound)	via EKC	6.92	1	6 min 18 sec
	with TM Scheme	9.34	10	11 min 35 sec
From C to A (westbound)	via EKC	6.92	1	6 min 46 sec
	with TM Scheme	7.28	9	7 min 37 sec

The increase in travelling distance for eastbound journeys ranges from 2.05km to 2.42km with corresponding increase in journey time of 5 min. 43 secs and 5 min. 17 secs. For westbound journeys, the increase in travelling distance is about 0.35km, with travelling time lengthened by around 50sec.

Reserve Capacity

Traffic assessment of the EKC scheme focuses on the hour between 1am and 2pm, which is the period with the heaviest traffic flow during the closure period from 1:00am to 5:30am.

The forecast reserve capacity¹ of the major signal junctions along the alternative routes are as follows.

Reserve Capacity (RC) of Junctions along Alternative Routes (1am to 2am)

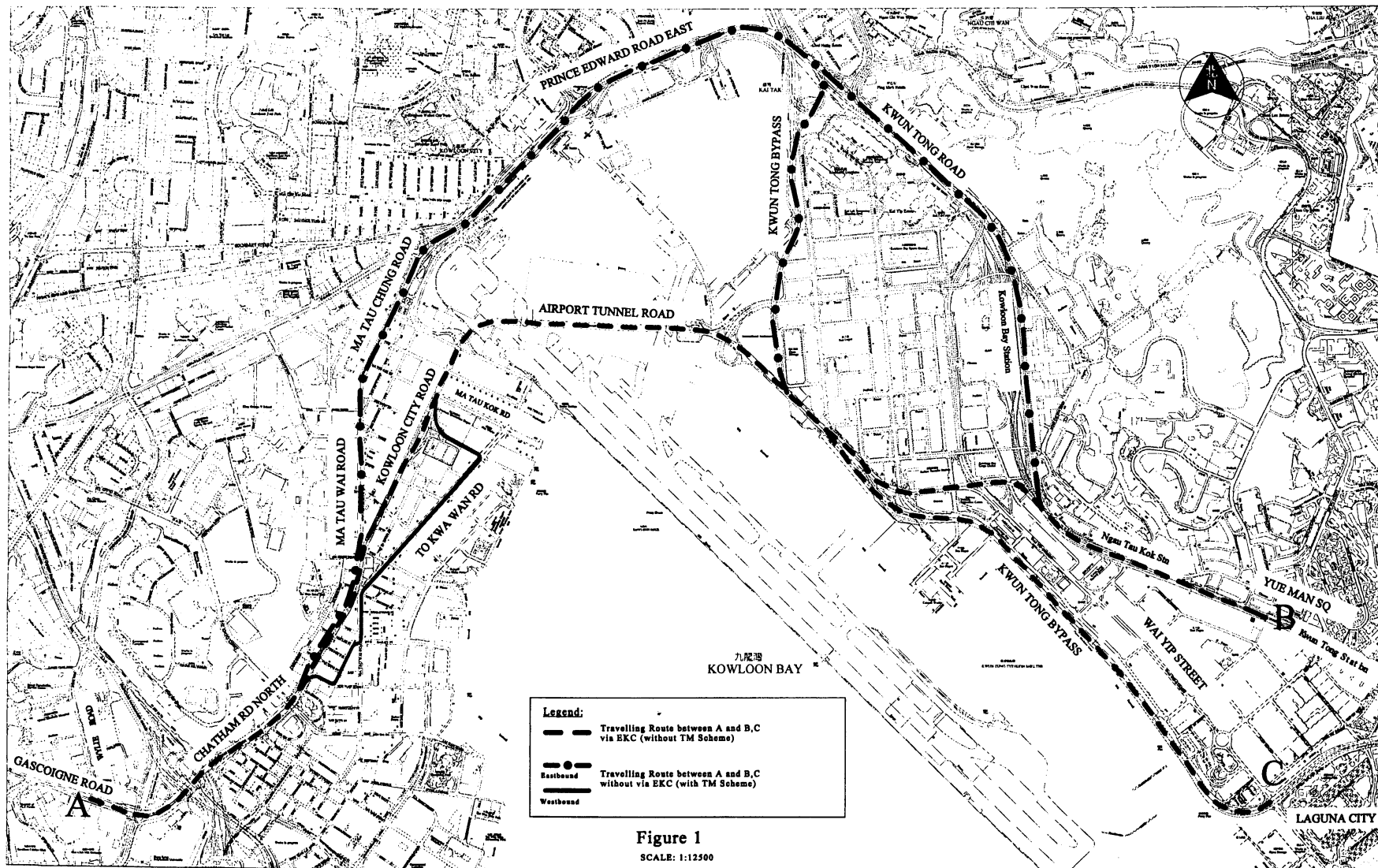
Junction	Forecast RC (with TM Scheme)
Chatham Road North/San Lau Street	+ 95%
Ma Tau Wai Road/Chi Kiang Street	+ 95%
Ma Tau Wai Road/Tin Kwong Road	+114%
Ma Tau Chung Road/Ma Tau Kok Road	+175%
Ma Tau Chung Road/Sung Wong Toi Road	+ 57%
Kwun Tong Road/Hong Ning Road	+216%
Wai Yip Street/Kwun Tong Bypass	+291%
To Kwa Wan Road/San Shan Road	+169%

¹ Reserve capacity (RC) of a junction is an indicator reflecting a junction's performance and its spare capacity to take up additional traffic. A negative RC indicates that the junction is overloaded, thus resulting in traffic queues and longer delays.

It can be seen that there are ample reserve capacities at the various major signal junctions along the alternative routes to cater for the diverted traffic.

3. Conclusion

From the above assessment, it can be concluded that the proposed traffic management scheme will not have adverse traffic impact on the road sections concerned. Although there will be an increase in travelling distance and time along the alternative routes particularly for eastbound traffic, the Transport Department could make appropriate adjustments to the signal timings of the major traffic signals to reduce journey time along alternative routes.



B. Kwai Chung Road Flyover (near Kwai Fong Estate)

The proposed scheme seeks to close the flyover from midnight to 6:00 am.

1. Alternative Routes

During the closure period, vehicles in both southbound and northbound directions will be diverted to the ground-level Kwai Chung Road immediately underneath the flyover, passing through two signal junctions. (Figure 2)

2. Traffic Assessment

Traffic Counts

Existing traffic flow along Kwai Chung Road Flyover

	Southbound (Kowloon direction)				Westbound (Tsuen Wan direction)			
	Taxi	Goods Vehicle	Others	Total	Taxi	Goods Vehicle	Others	Total
0 am – 1 am	29	10	76	115	71	13	91	175
1 am – 2 am	22	7	59	88	63	10	66	139
2 am – 3 am	26	14	30	70	65	10	50	125
3 am – 4 am	20	9	20	49	52	15	48	115
4 am – 5 am	11	8	25	44	32	13	48	93
5 am – 6 am	14	13	62	89	36	13	73	122

Travelling Distance and Time

The travelling distance along the flyover and the ground-level Kwai Chung Road is virtually the same. It is about 1,030 metres.

Journey time will be longer when the ground level road is used because of the need to go through signal junctions.

Southbound (Kowloon direction)

Via the flyover	Via ground-level route
70 seconds	110 seconds

Northbound (Tsuen Wan direction)

Via the flyover	Via ground-level route
70 seconds	140 seconds

(Note : this section of Kwai Chung Road has a speed limit of 50 km/h)

Reserve Capacity

The hour from midnight to 1 am is chosen for traffic assessment because it has the highest traffic volume when compared with the remaining five hours of the proposed closure period.

Forecast performance of the signal junctions during the closure period

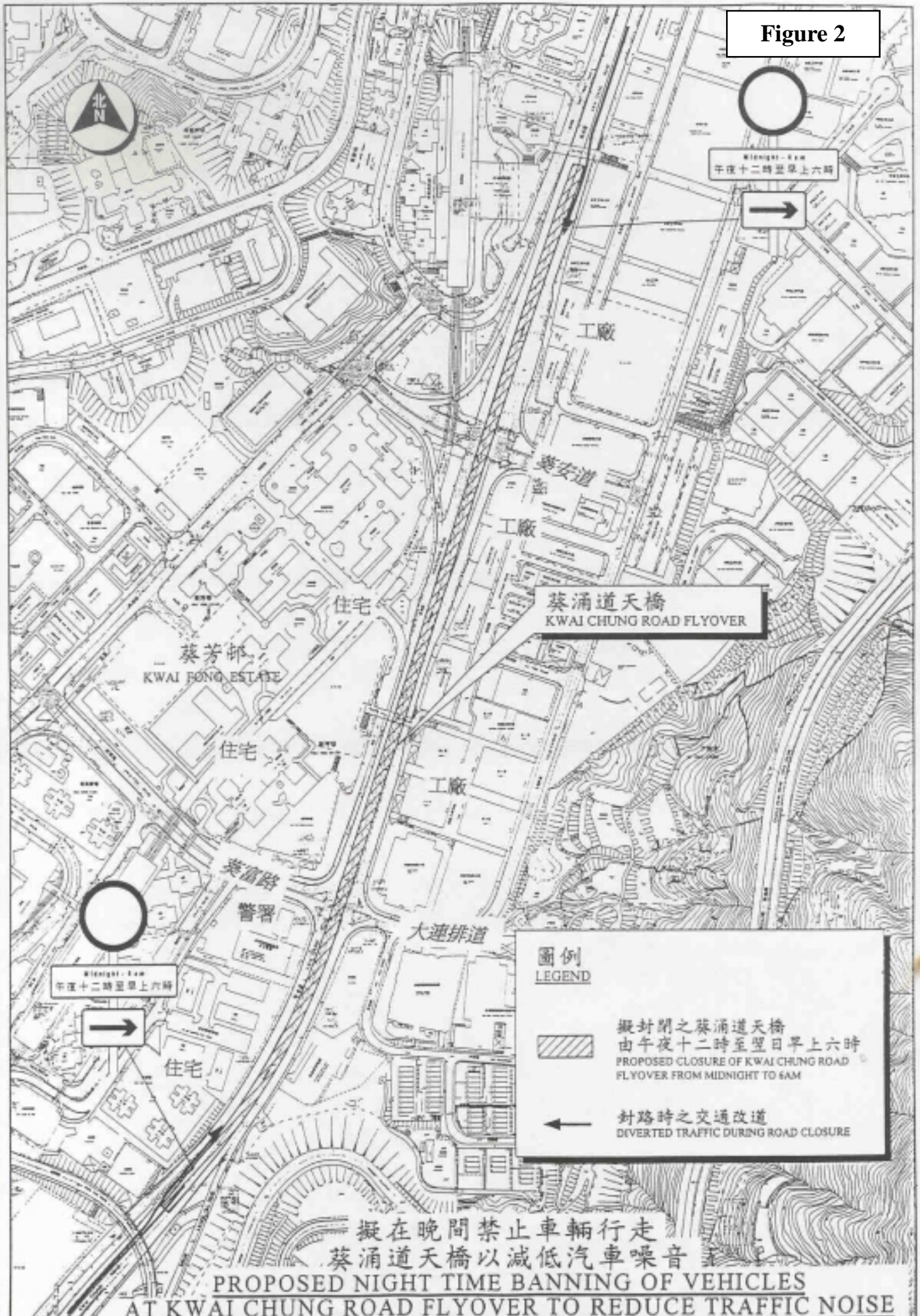
Junction	Reserve capacity
Kwai Chung Road/Kwai On Road	+313%
Kwai Chung Road/Kwai Foo Road/Tai Lin Pai Road	+338%

There will be no capacity problems with the signal junctions along the alternative route during the closure period of the flyover.



3. Conclusion

When the Kwai Chung Road Flyover is closed, the ground level road will have sufficient capacity to cope with the diverted traffic. Travelling time via the ground level road will increase by about 40 to 70 seconds. It can be concluded that the proposed will not bring about adverse traffic impact.

Figure 2



圖例
LEGEND

-  擬封閉之葵涌道天橋
由午夜十二時至翌日早上六時
PROPOSED CLOSURE OF KWAI CHUNG ROAD FLYOVER FROM MIDNIGHT TO 6AM
-  封路時之交通改道
DEVERTED TRAFFIC DURING ROAD CLOSURE

擬在晚間禁止車輛行走
葵涌道天橋以減低汽車噪音
PROPOSED NIGHT TIME BANNING OF VEHICLES
AT KWAI CHUNG ROAD FLYOVER TO REDUCE TRAFFIC NOISE

C. Texaco Road Flyover

The proposed scheme seeks to close the flyover from midnight to 6:00 am.

1. **Alternative Routes**

During the closure period, vehicles in both southbound and northbound directions will be diverted to the ground-level Texaco Road immediately underneath the flyover, passing through three signal junctions. (Figure 3)

2. **Traffic Assessment**

Traffic Counts

Existing traffic flow along the flyover

	Southbound (Tsing Yi direction)				Northbound (Tsuen Wan direction)			
	Taxi	Goods Vehicle	Others	Total	Taxi	Goods Vehicle	Others	Total
0 am – 1 am	78	10	140	228	47	40	159	246
1 am – 2 am	45	1	69	115	51	22	94	167
2 am – 3 am	32	5	42	79	44	14	46	104
3 am – 4 am	13	6	23	42	28	10	31	69
4 am – 5 am	20	2	41	63	33	11	38	82
5 am – 6 am	51	2	97	150	35	15	64	114

Travelling Distance and Time

The travelling distance along the flyover and along the ground-level Texaco Road is virtually the same. It is about 720 metres.

Journey time will be slightly longer when the ground level road is used because of the need to go through signal junctions.

Southbound (Tsing Yi direction)

Via the flyover	Via ground-level route
110 seconds	130 seconds

Northbound (Tsuen Wan direction)

Via the flyover	Via ground-level route
100 seconds	120 seconds

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

Reserve capacity

The hour from midnight to 1 am is chosen for the traffic assessment because it has the highest traffic volume when compared with the other remaining five hours during the proposed closure period.

Forecast performance of the signal junctions during the closure period

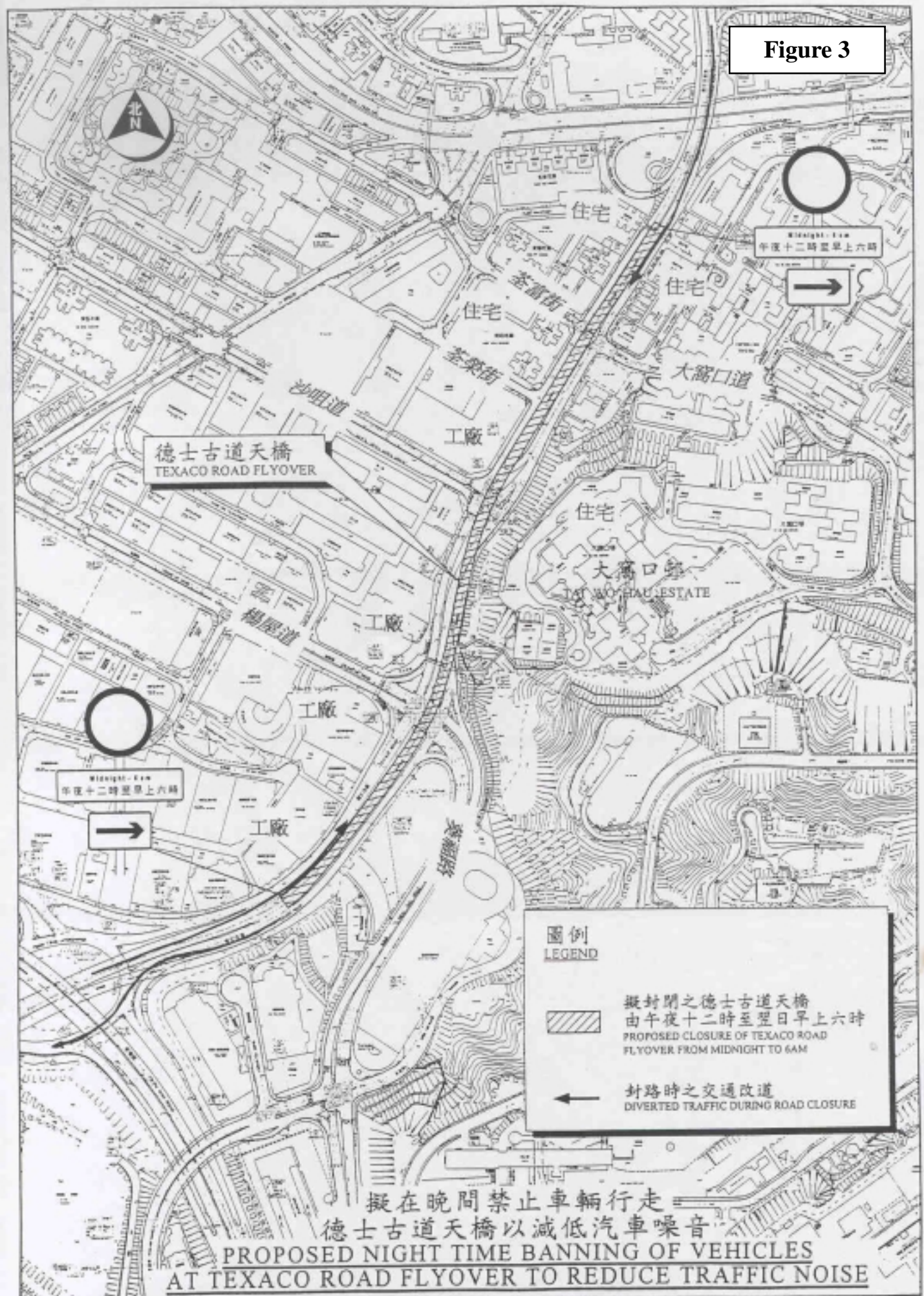
Junction	Reserve capacity
Texaco Road/Tai Wo Hau Road	+109%
Texaco Road/Shu Tsui Road	+ 83 %
Texaco Road/Yeung Uk Road	+171 %

There will be no capacity problems with the signal junctions along the alternative route during closure period of the flyover.

3. Conclusion

When the Texaco Road Flyover is closed, the ground level road will have sufficient capacity to cope with the diverted traffic. Travelling time via the ground level road will slightly increase by about 20 seconds. It can be concluded that the proposed will not bring about adverse traffic impact.

Figure 3



D. Ngan Shing Street, Shatin

In order to reduce noise disturbance while maintaining access to the residential area nearby, the scheme seeks to ban goods vehicles exceeding 5.5 tonnes from entering the section of Ngan Shing Street between Siu Lek Yuen Road and Chap Wai Kon Street from 11:00pm to 7am daily.

1. Alternative Routes

Good vehicles banned can use Chap Wai Kon Street and Siu Lek Yuen Road during the restricted hours. ((Figure 4)

2. Traffic Assessment

Traffic Counts

Existing traffic flow along Ngan Shing Street

	Eastbound (From Chap Wai Kon Street to Siu Lek Yuen Road)			Westbound (From Siu Lek Yuen Road to Chap Wai Kon Street)		
	Goods Vehicle	Others	Total	Goods Vehicle	Others	Total
11 pm – 0 am	2	271	273	4	354	358
0 am – 1 am	1	115	116	1	125	126
1 am – 2 am	3	97	100	2	81	83
2 am – 3 am	1	42	43	1	37	38
3 am – 4 am	1	59	60	1	48	49
4 am – 5 am	1	32	33	1	46	47
5 am – 6 am	3	84	87	4	84	88
6 am – 7 am	6	219	225	10	215	225

The peak hour of goods vehicle traffic within the proposed restriction period occurs between 6 am and 7 am. A total of about 20 goods vehicles go through Ngan Shing Street during the restricted hours and alternative route is available for such additional traffic volume.

Travelling Distance and Time

The additional travelling distance is about 200m, with an increase in travelling time of about 30 seconds.

		Travelling Distance (km)	No. of Signal Junctions Negotiated	Travelling Time
Eastbound	via Ngan Shing Street	0.75	4	2 min 15 sec
	with TM Scheme	0.94	4	2 min 35 sec
Westbound	via Ngan Shing Street	0.75	4	2 min 35 sec
	with TM Scheme	0.94	4	3 min 5 sec

Reserve Capacity

Forecast Reserve Capacity of signal junctions along alternative route between 11pm and midnight

Signal Junctions	Forecast Reserve Capacity
Siu Lek Yuen Rd/ Chap Wai Kon Street	+80%
Siu Lek Yuen Rd/ Po Shing Street	+90%
Siu Lek Yuen Rd/ Ngan Shing Street	+83%
Chap Wai Kon Street/ Ngan Shing Street	+76%

The signal junctions along the alternative route have adequate capacity to cope with the additional goods vehicle traffic.

3. Conclusion

Due to the small number of goods vehicles restricted, the traffic impact of the proposed scheme is insignificant and will not have adverse effect on the traffic conditions of the road sections concerned.

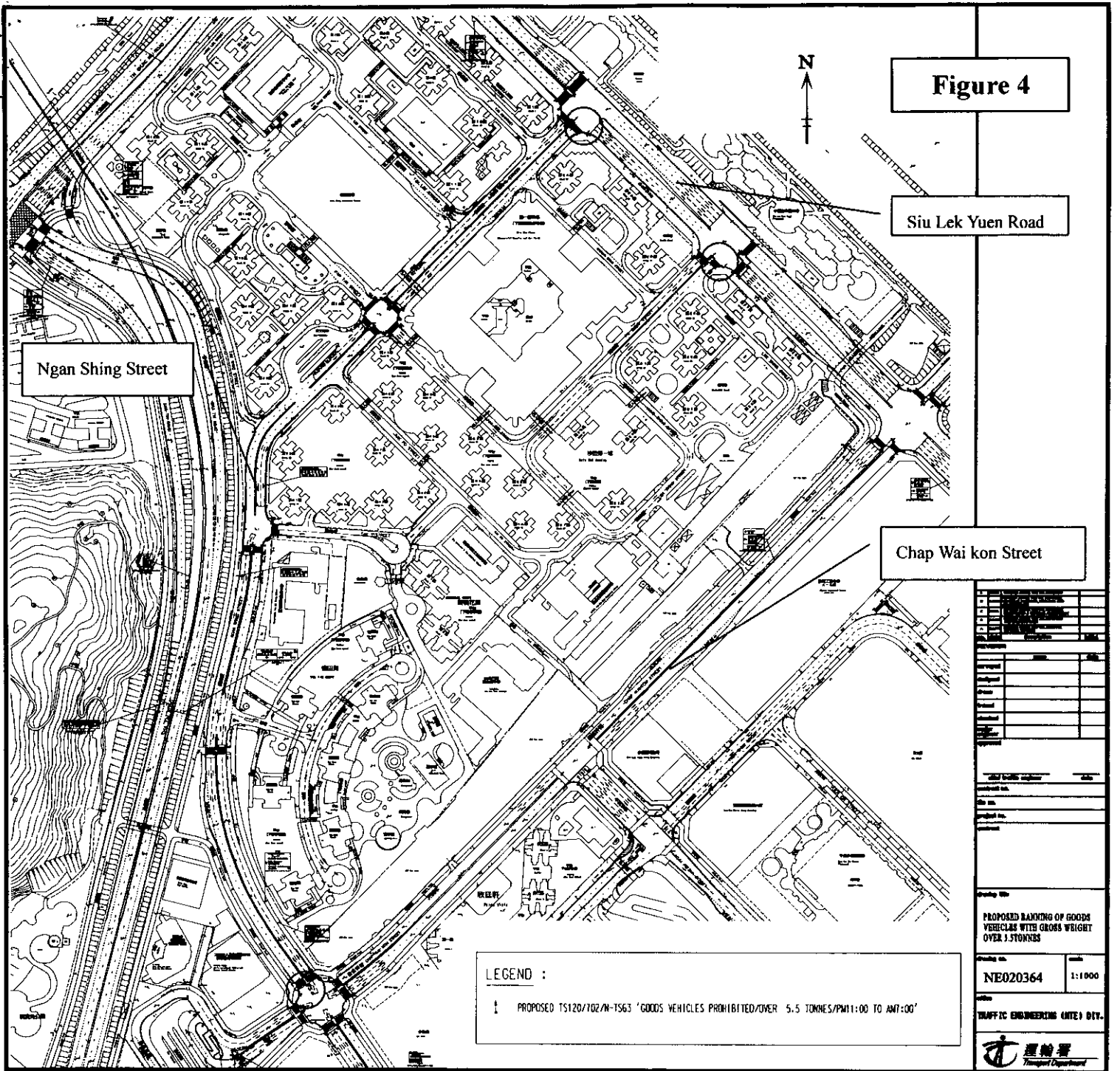



Figure 4

Siu Lek Yuen Road

Ngan Shing Street

Chap Wai kon Street

LEGEND :
 ↓ PROPOSED TS120/702/M-TS63 'GOODS VEHICLES PROHIBITED/OVER 5.5 TONNES/PM11:00 TO AM7:00'

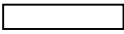

PROPOSED BANKING OF GOODS VEHICLES WITH GROSS WEIGHT OVER 3.5TONNES	
Drawing No.	Scale
NE020364	1:1000
TRAFFIC ENGINEERING (MTE) DIV.	
	

**CHANGE IN NOISE LEVELS
UPON IMPLEMENTATION OF PROPOSED SCHEMES**

A. FULL CLOSURE OF EAST KOWLOON CORRIDOR

Representative Noise Sensitive Receiver along the Flyover and its Diverted Routes	Number of Dwellings	Prevailing Noise Levels between 1:00 am and 2:00 am L ₁₀ (1 hour)	Full closure		Goods Vehicles (>5.5 tonnes) banned	
			Predicted Noise Level L ₁₀ (1 hour)	Maximum Change in Noise Level dB(A)	Predicted Noise Level L ₁₀ (1 hour)	Maximum Change in Noise Level dB(A)
Chatham Road North, above flyover	1,296	75	73	-2	75	0
Chatham Road North, below flyover	123	72	76	+4	74	+2
Kowloon City Road, between Sheung Heung Road and San Shan Road, above flyover	259	74	67	-7	73	-1
Kowloon City Road, between Sheung Heung Road and San Shan Road, below flyover	14	64	69	+5	66	+2
Kowloon City Road, between Chi Kiang Street and Sheung Heung Road	1,037	74	65	-9	73	-1
Ma Tau Wai Road, western side	3,034	70	75	+5	73	+3
Ma Tau Wai Road, eastern side	1,011	67	70	+3	68	+1
Prince Edward Road East	520	70	71	+1	71	+1
Kwun Tong Road	228	74	75	+1	75	+1
Ha Heung Road	1,271	62	66	+4	62	0
To Kwa Wan Road, western side	715	64	70	+6	67	+3
To Kwa Wan Road, eastern side	1,670	65	72	+7	69	+4

The change in noise level if only goods vehicles exceeding 5.5 tonnes is also projected. Since heavy vehicles only make up about 10% of the traffic flow along the East Kowloon

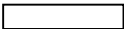

 Original Route
 Alternative Route

Corridor during the closure period, the noise benefit would be significantly reduced.

B. FULL CLOSURE OF KWAI CHUNG ROAD FLYOVER

Representative Noise Sensitive Receiver along the Flyover and its Diverted Routes	Number of Dwellings	Prevailing Noise Levels between midnight and 1:00 am L ₁₀ (1 hour)	Full closure		Goods Vehicles (>5.5 tonnes) banned	
			Predicted Noise Level L ₁₀ (1 hour)	Change in Noise Level dB(A)	Predicted Noise Level L ₁₀ (1 hour)	Change in Noise Level dB(A)
Sun Kwai Hing Garden	300	60	59	-1	59	-1
Kwai Fong Estate, above flyover	783	60	58	-2	59	-1
Kwai Fong Estate, below flyover	26	58	61	+3	60	+2
Kwai Fong Terrace and Police Staff Quarter, above flyover	344	64	62	-2	63	-1
Kwai Fong Terrace and Police Staff Quarter, below flyover	12	62	64	+2	63	+1

If only heavy goods vehicles are banned, the maximum noise benefit would be reduced to less than 1 dB(A).

 Original Route
 Alternative Route

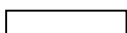

C. FULL CLOSURE OF TEXACO ROAD FLYOVER

Representative Noise Sensitive Receiver along the Concerned Flyover and its Diverted Routes	Number of Dwellings	Prevailing Noise Levels between midnight and 1:00 am L ₁₀ (1 hour)	Full closure		Goods Vehicles (>5.5 tonnes) banned	
			Predicted Noise Level L ₁₀ (1 hour)	Change in Noise Level dB(A)	Predicted Noise Level L ₁₀ (1 hour)	Change in Noise Level dB(A)
Tai Wo Hau Estate	720	66	65	-1	65	-1
East Asia Garden	300	69	68	-1	69	0
Wang Wah Building, above flyover	170	71	68	-3	69	-2
Wang Wah Building, below flyover	4	66	69	+3	67	+1

If only heavy goods vehicles are banned, the maximum noise benefit would be reduced to around 1 to 2 dB(A).

D. BANNING OF GOODS VEHICLES OVER 5.5 TONNES ALONG NGAN SHING STREET

Representative Noise Sensitive Receiver along the Road Section and its Diverted Routes	Number of Dwellings	Prevailing Noise Levels between 11:00 pm and midnight L ₁₀ (1 hour)	Goods Vehicles (>5.5 tonnes) banned	
			Predicted Noise Level L ₁₀ (1 hour)	Change in Noise Level dB(A)
CityOne Shatin, facing Ngan Shing Street	1,380	76	76	0
Yue Tin Court, facing Ngan Shing Street	351	76	76	less than 1 dB(A)
CityOne Shatin, facing Siu Lek Yuen Road	360	73	73	0
Yue Tin Court, facing Chap Wai Kon Street	900	63	63	less than 1 dB(A)

 Original Route
 Alternative Route

Feasibility of Erecting Noise Barriers at the concerned Flyovers/Road Section

	Factors to be considered					Is retrofitting of barriers technically feasible?	Remarks
	Adequate space available?	Structurally capable of supporting barriers?	Any obstruction to emergency access or fire fighting?	Any impact on road safety?	Any interference with social / commercial activities?		
East Kowloon Corridor	No	No	Yes	No	Yes	No	Paved with low noise materials
Kwai Chung Road Flyover	No	No	No	No	No	No	Paved with flexible bituminous materials (see Note below)
Texaco Road Flyover	No	No	No	No	No	No	
Ngan Shing Street	No	N/A	Yes	Yes	Yes	No	

Note: The high percentage of heavy vehicles (e.g. container trucks, buses) on Kwai Chung Road Flyover, Texaco Road Flyover and Ngan Shing Street renders re-surfacing with low noise materials ineffective and impracticable.