LEGISLATIVE COUNCIL PANEL ON TRANSPORT

The Administration's Response to the Report on Enhancement of Highway Safety

Introduction

This paper briefs Members on the Administration's plan to implement the recommendations put forth by the Tuen Mun Road Traffic Incident Independent Expert Panel in its Report on Enhancement of Highway Safety (the Report).

Background

2. Following the traffic incident on Tuen Mun Road, the Chief Executive appointed an Independent Expert Panel (the Expert Panel) to examine and recommend safety measures to prevent similar catastrophes. The Panel completed its review and submitted the Report to the Chief Executive in November 2003.

3. The Expert Panel briefed Members on its key recommendations at the Special Meeting on 5 December 2003, and the Administration undertook to revert on our assessment on and plan to take forward the recommendations. In the process of examining the recommendations, we have consulted the Transport Advisory Committee and the Road Safety Council (RSC). Both are supportive of the Expert Panel's improvement proposals. We consider the Expert Panel's recommendations comprehensive and useful in enhancing highway safety, and have worked out an implementation plan to take forward their recommendations under different key areas. Measures to be undertaken in the short, medium and long term[1] are listed below. The sections follow the categorisation under Chapters 5 to 10 of the Report.

Driving Behaviour

4. The Administration agrees that driving behaviour and attitude has a great bearing on road safety, and it is vital to foster a responsible and caring driving culture through publicity and driving training. There are on-going efforts by the RSC, Hong Kong Police Force (HKPF) and Transport Department

[1] Short term refers to a period within three months; medium term refers to a period between four to 12 months; and long term refers to a period of one or two years.

(TD) to promote good driving practices in addition to condemning aggressive driving behaviour, and to collaborate with District Councils to extend the reach of road safety campaigns. The RSC will also consider the Expert Panel's proposal for the Council to draw up a longer term programme extending beyond the normal annual cycle. In addition, the Administration will take forward the following enhancement measures recommended by the Expert Panel.

Short term

Reach out to self-employed and individual drivers

5. HKPF and TD have been promoting road safety to the public transport trades and professional drivers through forums and seminars. Between 2002 and July 2003, TD organised eight road safety seminars for franchised bus drivers to promote road safety awareness and proper driving behaviour. We agree with the Report that such publicity and educational efforts should be extended to self-employed and individual drivers. In fact, HKPF has stepped up publicity for professional drivers by disseminating road safety leaflets to heavy vehicle drivers at boundary crossing points, container terminals and car parks. Both HKPF and TD will explore effective avenues, particularly through the trade associations, to spread the road safety messages.

Make Driver Improvement Scheme mandatory for repeat traffic offenders

6. At present, except for those who are directed by the court, motorists are encouraged to join the Driver Improvement Scheme (DIS) on a voluntary basis. To train repeat traffic offenders on good driving practices, TD will explore the feasibility of requiring drivers who have accumulated a certain number of 'Driving Offence Points' to attend DIS on a mandatory basis. Views from this Panel, the professional drivers and the general public would be sought. If the proposal is considered feasible, we will take the necessary steps to amend the relevant legislation.

Extend the 'probationary driving licence' arrangement

7. Currently, motorcyclists who have passed the driving test would need to go through a one-year probationary period. During that period, the probationary driving licence ("P" licence) holders will be subject to additional restrictions, including the requirement to display a "P" plate on the motorcycle, the prohibition against carrying passengers and the prohibition against driving above 70 kilometres per hour (kph) even on expressways where the prescribed speed limit exceeds 70 kph. Such arrangement has proven to be effective in reducing traffic accidents involving inexperienced motorcyclists, and the

average accident involvement rate dropped by about 60% after the introduction of the scheme on 1 October 2000. In view of the improvement in safety record and the advantage of allowing new drivers to obtain on-the-road experience, including expressway driving experience, before being issued with a full driving licence, TD will explore the feasibility of extending the "P" licence arrangement to cover new private car and light goods vehicle drivers. We will consult Members, the transport trades and relevant organisations in the process. If the proposal is considered feasible, we will take the necessary steps to amend the relevant legislation.

Medium term

Devise an evaluation methodology to assess the effectiveness of promotional programmes

8. The Administration appreciates the year-round promotional efforts launched by the RSC and notes that RSC has been measuring public awareness of its publicity programmes. To facilitate fine-tuning of promotional strategies for different audiences, RSC will explore, with the assistance of professional institutes, an appropriate evaluation methodology to assess the effectiveness of its programmes. The details will be worked out by the RSC.

Skills Upgrading Scheme for passenger services transport trades

9. The Vocational Training Council is developing a Skills Upgrading Scheme for the passenger services transport trades, including taxis, public light buses and non-franchised buses. The Scheme is scheduled to be launched in the first quarter of 2004. The Government will reimburse drivers from passenger services transport trades who attend the Scheme voluntarily up to 70% of the training fee for the Scheme. TD will review the content of the Skills Upgrading Scheme to ensure that sufficient emphasis is placed on promoting good driving practices and that proper recognition is given to drivers who have completed the course. To provide better training for professional drivers in other transport trades, TD will also explore with relevant organisations the development of similar skills upgrading programmes.

Quality Driving Instructor Course

10. The Administration agrees that it is important for driving instructors to have the proper knowledge and teaching skills to pass on good driving practices to their students. TD will explore the feasibility of introducing a 'Quality Driving Instructor Course' to enhance the professional competency of driving instructors.

Long term

Pre-service training for professional drivers

11. In early 2004, all applicants for a taxi driving licence will be required to attend a mandatory pre-service training programme before they can qualify for a taxi driving licence. After the new scheme has been implemented, TD will review the effectiveness of the requirement and consider whether it should be extended to drivers of public light buses and other professional drivers. Legislative amendments will be needed for such mandatory pre-service training requirement.

Legislation and Enforcement

12. The Administration agrees that comprehensive legislation and effective enforcement are instrumental in combating undesirable driving behaviour. As proposed by the Expert Panel, HKPF will continue to devise enforcement programmes in tandem with the publicity plan mounted by the RSC. In addition, HKPF will further explore advanced technologies that will facilitate enforcement. For instance, HKPF are examining the use of new speed radar and new motorcycle video system, and they are also enhancing their computer systems to automate and streamline the traffic enforcement process. As legislative amendments and installation of traffic enforcement equipment take time, the improvement measures set out in the following paragraphs will be taken forward as soon as possible but may require some time to complete.

Medium term

Legislative amendments

13. To increase the deterrent effect, we intend to add the following common traffic offences (which at present are prosecuted by summons) to the Schedule to the Fixed Penalty (Criminal Proceedings) Ordinance -

(a) using a handheld mobile telephone or a telecommunications device while the vehicle is in motion;

(b) failing to drive in the nearside lane of the carriageway of the expressway; and

(c) driving motorcycle or motor tricycle without necessary lights illuminated.

14. As pointed out by the Expert Panel, failure to keep a safe distance from the vehicle ahead is one of the major factors leading to traffic accidents. At present, this act can only be prosecuted under 'careless driving', and the process to prove such an offence in court is rather complicated. We share the Expert Panel's concern and are actively examining the creation of a new offence against 'failing to keep a safe distance' or 'tailgating'.

Installation of Speed Enforcement Cameras

15. We updated Members on the progress of the installation of speed enforcement cameras (SECs) at the previous Panel Meeting on 5 December 2003. So far, installation works at 47 of the 75 sites have been completed and the remaining works will be completed by February 2004. Apart from the 75 locations mentioned above, TD will also examine the feasibility of expanding the SEC coverage to new strategic road network (SRN) routes, existing SRN routes without such systems as well as other routes with speeding problems.

Traffic Engineering and Management

16. We attach great importance to traffic engineering and management issues as they define the road environment and shape the behaviour of road users. Many of the Expert Panel's recommendations are on-going efforts undertaken by TD. On speed limit, the Working Group on Speed Limit comprising members from TD, HKPF and other related non-government organisations has been conducting regular reviews of speed limits. TD will continue to conduct such reviews and, if necessary, adjust the speed limit for specific road sections. Both the need to optimise traffic flow and to enhance road safety will be taken into account in such exercises.

17. To enhance the safety of franchised bus, TD has requested all bus operators to conduct a comprehensive review on their safety arrangements and submit a detailed report in early 2004. In addition, TD will continue to -

(a) conduct careful route planning, taking into account the suitability of bus operations with regard to the design/conditions of the roads concerned, as well as the deployment of suitable vehicle models on the routes;

(b) ensure that all vehicles deployed are maintained up to the required standard;

(c) review guidelines on working hours of bus drivers (this is one of the areas that the bus operators have been asked to review and discuss with their staff);

(d) identify and study bus accidents to map out improvement measures; and

(e) promote bus passenger safety and safe driving through different publicity means.

18. To achieve continuous safety enhancement, TD will expedite the implementation of improvement measures and keep track of best practices adopted in overseas countries. TD will also keep a close watch on the safety record of specific vehicle types and take proactive steps to enhance their safety standards with the participation of relevant transport trades.

Medium term

19. TD undertook the "Comprehensive Review of Directional Signing in Hong Kong" in 2001 to assess the standards of directional signing adopted in Hong Kong as compared with those of overseas countries, and to identify areas for continuous improvement. To follow up on the Review, TD will rationalise the route numbering system and provide exit numbers on SRNs to give clearer directions to road users by early 2004. Other recommendations arising from the Study will be assessed in a pilot scheme in Shatin to be commenced in March 2004. TD and the Highways Department (HyD) will speed up the implementation of the pilot scheme and the evaluation process so that an implementation programme can be drawn up for the rest of the road network as soon as possible. To avoid creating any confusion, TD will formulate a publicity programme to brief motorists whenever there are changes in signing standards.

Vehicle Control

20. The Expert Panel has rightly pointed out that modern designs have made vehicles much safer, and it is often the way in which it is used and maintained that affects road safety. On speed control and vehicle maintenance, the following measures will be implemented.

Short term

Extend the use of speed display devices to more public light buses

21. Under a trial scheme, speed display units (SDU) have been installed in 243 green minibuses (GMBs) which operate overnight. TD is evaluating the effectiveness of the SDU installed in those GMBs. If the results show that SDUs are effective in tackling the speeding problem, we would consider extending their use to more public light buses in future.

Step up joint road side spot check

22. Roadside enforcement is effective to ensure that the vehicle owners or drivers maintain their vehicles in a roadworthy condition and in compliance with the relevant legislation. Vehicles which are suspected to be defective and/or overloaded would be selected for examination and directed to the check sites by a police officer. Vehicle examiners from TD will inspect and check the mechanical components of the vehicles and conditions of the bodywork against construction and maintenance standards. TD and HKPF will step up such joint roadside spot checks on heavy vehicles.

Medium term

Extend the stability test to heavy goods vehicles

23. Franchised and non-franchised buses as well as light buses are subject to a stability test (tilt test). To illustrate, the stability of a double-decked bus is checked by loading weights in relative positions to represent the driver and a full complement of passengers on the upper deck. The vehicle passes the test if it does not overturn when titled to either side at an angle of 28 degrees or more from the horizontal. TD will explore the feasibility of extending the stability test to heavy goods vehicles.

Long term

Require franchised buses and heavy vehicles to install speed limiters

24. At present, many new franchised buses have been installed with electronic engine management systems with speed limiting functions. We intend to make this a requirement for all newly registered franchised buses. As legislative amendments are required, this improvement measure will be implemented in the long term. We will also explore the feasibility of installing speed limiters in other heavy vehicles, subject to consultation with the relevant

transport trades.

Install tachographs

25. Tachographs (blackboxes) serve useful accident investigation and fleet management functions. TD will examine the availability and specifications of existing designs and study the viability of the recommendation to install such devices in franchised buses and other vehicles.

Vehicular Parapet Design

26. We appreciate the public concern about the design of vehicular parapets after the incident on 10 July. As pointed out by the Expert Panel, parapets are protective devices to reduce the consequences in case accidents occur. It is important to strike a balance between risk and the level of containment as no parapet offers equally good protection to all vehicle types. A strong parapet that contains a heavy vehicle may cause considerable damage to a small vehicle and subject its occupants to injury. Conversely, a parapet designed for light vehicles would not perform equally well for larger vehicles and may not be able to contain it in case of a severe impact. Taking the above considerations into account, HyD will implement the following enhancement measures, in addition to its on-going research work on parapet design in collaboration with tertiary institutions.

Short term

Revise the General Specification for Civil Engineering Works

27. While particular specification on testing requirements may be included in individual construction contracts, given the structural significance of parapets, HyD will revise the General Specification for Civil Engineering Works to include testing requirements for fabricating the steel components used in vehicular parapets.

Replace all first-generation P1 parapets

28. The computer simulations conducted by HyD have confirmed that the second-generation three-rail P1 parapets have higher containment capability than those of the first generation. HyD has scheduled for the replacement of all first-generation three-rail parapets in Hong Kong, and 42 km out of 90 km of the first generation P1 parapets have been replaced. HyD will expedite the replacement programme. We aim to complete the programme within 2004.

Medium to long term

Conduct further computer simulations and carry out in-service evaluations

29. While previous computer simulations have confirmed that all five types of P1 vehicular parapets do meet the designed level of containment as required by the Structures Design Manual, HyD will conduct further computer simulations to establish the ultimate capacity of P1 parapets relating to an impact by a double-decked bus and fully evaluate the adequacy of the standard height adopted for P1 parapets. In addition, HyD will evaluate the parapet designs on the basis of the damage information collected after traffic accidents.

Align the Structures Design Manual with the new international standards and develop new designs

30. For long term improvement, HyD will follow closely the development of the European (EN1317) and other relevant international standards, bring the Structures Design Manual in line with the new internationally recognised standards in phases, and expand the containment levels of vehicular parapets taking into account the extensive use of double-decked buses in Hong Kong. HyD will also monitor closely the development of multiple containment parapets in the international scene, and develop appropriate parapet designs for Hong Kong.

Issue guidelines and analysis procedures on the choice of parapets

31. Subject to the findings of the aforesaid computer simulations and development work, HyD will issue further guidelines on the choice of containment level and height of parapets, with particular reference to Hong Kong's unique situation in respect of limited space and heavy usage of double-decked buses.

Tuen Mun Road

Short term

Implement enhancement measures at the incident spot

32. HyD has already strengthened the parapet at the incident spot with additional posts, and has also installed a line of safety barrier alongside the parapet to cater for smaller vehicles. TD has also put in place a series of enhancement measures for the road section in the vicinity of the incident spot. A new Advance Information Sign (AIS) has been installed before the Final

Advance Direction Sign (ADS) to provide additional information to motorists of the exit ahead. A 100 m section of lane line markings has been converted to warning line markings before the start of the diverging point to enhance awareness of the diverging point. The edge line marking has been widened from 200 m to 300 m at the diverging point to enhance definition at that spot. A 'Get In Lane' sign between the AIS and ADS has been installed to provide additional warning on lane changing and a crash cushion has been installed at the nosing between the main road and the slip road as an additional safety precaution. Action is in hand to align the ADS immediately over the inside lane to alert motorists to keep left for the exit ahead.

Conduct a comprehensive safety review

33. Tuen Mun Road has already been in service for more than twenty years. A number of major improvement works have been carried out in the past years to bring it in line with prevailing design standards and guidelines, while small scale improvements have also been implemented as a result of previous accident investigations. Nevertheless, TD is conducting a comprehensive road safety review on Tuen Mun Road, particularly from the drivers' perspective, to identify any possible traffic engineering measures that can further enhance safety before the implementation of the Tuen Mun road reconstruction and improvement project.

34. The tasks covered by the road safety review are summarised below -

(a) Data Collection
- as-built drawings
- traffic aids drawings
- directional sign drawings
- planned project studies

(b) Document Assessment
- desk-top review of collected documents

(c) Site Inspections
- get the driver's and passenger's perceptions
- photo and video taking

(d) Identify Safety Enhancement Areas
- record locations where there is room for safety enhancement

(e) Revisit Accident Data and Accident Prone Locations
- check accident history of those locations identified in (d) above
- reconfirm the areas for safety enhancement with accident data

(f) Consultation and Liaison
- preliminary feasibility study of suggested improvements
- consult local residents and relevant departments on suggested improvements

(g) Implementation of Improvement Measures
- circulate the recommended improvement measures
- implement the measures

The review is expected to be completed in the first quarter of 2004. For those high priority locations on Tuen Mun Road identified by HyD and the Expert Panel as mentioned in paragraph 38, and for other items not requiring consultation, work will soon commence. The work program is shown in **Annex I**.

Medium term

Tuen Mun Road reconstruction and improvement project

35. We have been planning for the Tuen Mun Road reconstruction and improvement project. Our original plan was to start the project in late 2005. TD and HyD has worked closely with the Expert Panel in identifying means to advance the Tuen Mun Road reconstruction and improvement project. Through streamlining planning and design processes, the project will begin in mid-2005, which is six months earlier than originally planned. The project will be completed in phases between mid-2009 and mid-2011. TD has reviewed the time window for lane closure and devised preliminary proposals to implement lane closures during daytime off-peak hours to facilitate construction works. HyD will conduct another traffic impact assessment, taking into account relaxations on lane closure arrangements and the projected traffic conditions of the Tuen Mun Road, with a view to further shortening the construction period.

36. In preparing for this reconstruction and improvement project, HyD will conduct a comprehensive review of the alignment and design of the Tuen Mun Road to identify areas for further improvement to bring the entire Tuen Mun Road up to current expressway standards.

Install SECs and step up patrolling

37. Since the major contributory factors of traffic accidents along Tuen Mun Road are driver related, TD and HKPF will try to bring the SEC system into operation before the first quarter of 2004. HKPF will also deploy the resources released from speed enforcement to patrolling, targetting more on undesirable driving behaviour which cannot be captured by the SEC system.

Road Safety Enhancement for Priority Locations

38. HyD has worked with the Expert Panel to identify a list of high priority locations having similar characteristics as the incident site. Those characteristics include high posted speed limit, high traffic volume, high bus usage, high percentage of commercial vehicles, vicinity to expressway entrance with weaving traffic, high level above ground, and having residents (or other special features such as the sea) underneath the road structure. The 39 locations along the 16 roads are set out in **Annex II**.

39. We would like to highlight that those locations are <u>not</u> accident blackspots. Nevertheless, as they do share similar characteristics with the incident spot, we agree with the Expert Panel that they should warrant our special attention. Accordingly, HyD and TD have formulated a package of immediate and longer term improvement works for these 39 locations in line with the total safety management approach advocated by the Expert Panel. These comprise both enhancement works on parapets and barriers, as well as traffic management measures to enhance the safety of the identified locations.

40. On short to medium term enhancement works to parapets and barriers, four types of works will be considered, depending on the type of parapet/barrier currently in use, the site constraints e.g. availability of space, and the structural considerations -

(a) replacing existing corrugated beam barriers by thrie-beam barriers strengthened with additional rails at the back ;

(b) adding rails at the back of existing thrie-beam barriers;

(c) installing thrie-beam barriers in front of some of the bridge parapets; and

(d) adding temporary posts and rails to steel parapets.

41. Thrie-beam barriers have a higher containment capacity than corrugated beam barriers. Adding additional rails at the back of thrie-beam barriers will further enhance the barriers' containment capacity in case of impact. The additional row of thrie-beam barriers in front of bridge parapets provides a more flexible barrier and better protection to smaller vehicles. It will also provide interim enhancement to the containment capacity of the combined parapet/barrier system. However, due to space constraints and other limitations, not all the priority road sections can install such additional barriers. In the case of steel parapets, we shall add temporary posts and rails to enhance the containment capacity in the interim, pending the outcome of the detailed study and computer simulations mentioned in paragraph 42 below.

42. In the longer term, HyD will strengthen the existing parapets by adding posts and rails of modified sizes. HyD will conduct computer simulations in regard to vehicular impacts on parapets and barriers as well as impact tests on modified parapet/barrier designs to establish their containment capacities and refine the design. For the 39 priority locations, site specific studies will be carried out to confirm how the design of parapets/barriers can be further improved.

43. On the traffic management side, TD would put in place traffic management measures for different locations to enhance safety, provide better information to motorists and control their driving speed and lane changing behaviour. The measures include -

Civil Works

(a) add crash cushion at diverging nosing
(b) seal off emergency opening on central barrier
(c) replace existing tubular railings with concrete barrier

Traffic Signs

(a) install 'Get in Lane' sign
(b) install sharp deviation signs
(c) replace existing sharp deviation signs with ones with yellow border
(d) install additional speed enforcement camera signs
(e) replace existing count-down markers with expressway type
(f) install additional speed limit signs

Directional signs

(a) realign advance directional signs
(b) increase x-height* of roadside directional signs

* Size of letters and numbers on the sign.

Road Markings

(a) change lane lines into warning lanes
(b) change lane lines into solid-cum-broken/double white lines
(c) widen edge line marking
(d) add warning arrows on merging lane
(e) paint chevron markings on central divider
(f) add speed limit marking
(g) add edge line marking

Others

(a) improve the lighting

44. The detailed improvement works for the 39 locations are also set out in **Annex II**.

45. We are working out the cost estimates for the enhancement measures and will finalise the implementation programme. We shall separately seek funding approval from the Public Works Sub-Committee and Finance Committee of this Council.

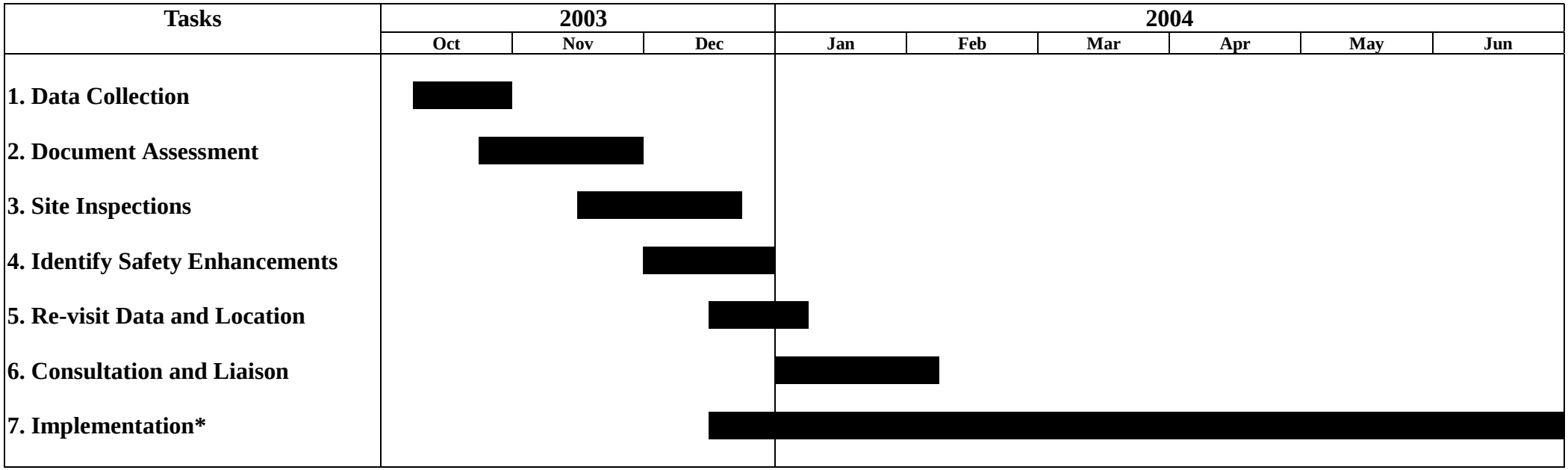
Advice Sought

46. Members are invited to note the Administration's plan in response to the recommendations of the Expert Panel set out in this paper.

Environment, Transport and Works Bureau
December 2003

Annex I

Program – Road Safety Review of Tuen Mun Road



* Note : Implementation of safety enhancements for high priority locations on Tuen Mun Road and other measures not requiring consultation was started in mid December 2003

Annex II

Proposed Enhancement Works for Priority Locations

District	Road	Location	Proposed Short-term Enhancement Works	Proposed Long-term Enhancement Works (subject to further simulations and detailed examination)
NT	Tuen Mun Road (7 locations)	1. Between Yau Kom Tau and Chai Wan Kok	• Add thrie-beam barriers in front of part of parapets • Install sharp deviation signs • Replace existing sharp deviation signs with ones with yellow border • Change certain lane lines into warning lines • Paint chevron markings on central divider • Improve lighting • Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	• Strengthen steel parapets by adding posts and rails
		2. Between Gemini Beaches and Ting Kau	• Additional line of thrie-beam barriers has been installed in front of parapets at incident spot and parapets are strengthened with additional posts • Add thrie-beam barriers in front of part of steel parapets • Add temporary posts and rails at part of steel parapets • Strengthen thrie-beam barriers by adding rails at the back and replace corrugated beam barriers by thrie-beam barriers with additional rails at the back • Add crash cushion at diverging nosing	• Strengthen steel parapets by adding posts and rails

District	Road	Location	Proposed Short-term Enhancement Works	Proposed Long-term Enhancement Works (subject to further simulations and detailed examination)
			• Seal off emergency opening on central barrier • Install get-in-lane sign • Change certain lane lines into solid-cum-broken/ double white lines • Widen diverging point edge line marking from 200mm to 300mm • Add warning arrows on merging lane	
		3. Sham Tseng	• Strengthen thrie-beam barriers by adding rails at the back • Add temporary posts and rails at steel parapets • Replace existing sharp deviation signs with ones with yellow border • Widen diverging point edge line marking from 200mm to 300mm • Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	• Strengthen steel parapets by adding posts and rails
		4. Tsing Lung Tau	• Add thrie-beam barriers in front of part of steel parapets • Add temporary posts and rails at part of steel parapets • Strengthen thrie-beam barriers by adding rails at the back and replace corrugated beam barriers by thrie-beam barriers with additional rails at the back • Seal off emergency opening on central barrier	• Strengthen steel parapets by adding posts and rails

District	Road	Location	Proposed Short-term Enhancement Works	Proposed Long-term Enhancement Works (subject to further simulations and detailed examination)
			● Replace existing sharp deviation signs with ones with yellow border ● Change certain lane lines into warning lines ● Paint chevron markings on central divider ● Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	
		5. Between Tai Lam Kok and Siu Lam Interchange	● Strengthen thrie-beam barriers by adding rails at the back and replace corrugated beam barriers by thrie-beam barriers with additional rails at the back ● Replace existing count down markers with expressway type ● Increase x-height of the roadside directional sign	
		6. Between Siu Lam and Cafeteria Old Beach	● Seal off emergency opening on central barrier ● Paint chevron markings on central divider ● Check road markings/traffic signs/reflective road studs and repaint/replace faded ones	
		7. Sam Shing Hui	● Strengthen thrie-beam barriers by adding rails at the back ● Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	

District	Road	Location	Proposed Short-term Enhancement Works	Proposed Long-term Enhancement Works (subject to further simulations and detailed examination)
NT	Tolo Highway (4 locations)	1. Opposite side of KCRC Tai Po Market Station	• Replace corrugated beam barriers by thrie-beam barriers with additional rails at the back • Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	
		2. Ma Wo	• Strengthen thrie-beam barriers by adding rails at the back and replace corrugated beam barriers by thrie-beam barriers with additional rails at the back • Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	
		3. Over Shek Lin Road	• Add temporary posts and rails at steel parapets • Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	• Strengthen steel parapets by adding posts and rails
		4. Lam Kam Road Interchange	• Add posts at parapets • Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	• Strengthen aluminium parapets by adding posts and rails
NT	Tsuen Wan Road (3 locations)	1. Between Kwai Chung Road and Kwai Tsing Road	• Add temporary posts and rails at steel parapets • Change certain lane lines into warning lines/ solid-cum-broken/double white lines • Check road markings/traffic signs/	• Strengthen steel parapets by adding posts and rails

District	Road	Location	Proposed Short-term Enhancement Works	Proposed Long-term Enhancement Works (subject to further simulations and detailed examination)
			reflective road studs and repaint/replace faded ones	
		2. Kwai Chung Road	● Add temporary posts and rails at steel parapets ● Change certain lane lines into warning lines/solid-cum-broken/double white lines ● Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	● Strengthen steel parapets by adding posts and rails
		3. Between Wing Kei Road and Tuen Mun Road	● Add crash cushion at diverging nosing ● Change certain lane lines into warning lines/solid-cum-broken/double white lines ● Widen diverging point edge line marking from 200mm to 300mm ● Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	● Strengthen concrete parapets by adding top rails
NT	Sha Tin Road (3 locations)	1. Over Lion Rock Tunnel Road	● Install sharp deviation signs ● Change certain lane lines into warning lines ● Add warning arrows on merging lane ● Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	● Strengthen concrete parapets by adding top rails
		2. Over Shui Chuen Au Street	● Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	● Strengthen concrete parapets by adding top rails

District	Road	Location	Proposed Short-term Enhancement Works	Proposed Long-term Enhancement Works (subject to further simulations and detailed examination)
		3. Over Shing Mun River	• Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	• Strengthen concrete parapets by adding top rails
NT	Shing Mun Tunnel Road (3 locations)	1. Over Lower Shing Mun Reservoir	• Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	• Strengthen concrete parapets by adding top rails
		2. Between Lion Rock Tunnel Road and Mei Tin Road	• Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	• Strengthen concrete parapets by adding top rails
		3. Pak Tin	• Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	• Strengthen concrete parapets by adding top rails
NT	Tseung Kwan O Tunnel Road (2 locations)	1. Over Po Hong Road	• Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones • Repair road surface/re-surface	• Strengthen concrete parapets by adding top rails
		2. Section of road connecting Tseung Kwan O Tunnel at Tseung Kwan O	• Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones • Repair road surface/re-surface	• Strengthen concrete parapets by adding top rails
NT	Yuen Long Highway (3 locations)	1. Over Kung Um Road and nullah	• Change certain lane lines into solid-cum-broken/ double white lines • Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	• Strengthen concrete parapets by adding top rails

District	Road	Location	Proposed Short-term Enhancement Works	Proposed Long-term Enhancement Works (subject to further simulations and detailed examination)
		2. Over Tai Shu Ha Road East and nullah	• Install get-in-lane sign • Install enforcement camera sign • Change certain lane lines into solid-cum-broken/ double white lines • Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	• Strengthen concrete parapets by adding top rails
		3. Over Pok Oi Interchange	• Add thrie-beam barriers in front of concrete parapets • Add crash cushion at diverging nosing • Install get-in-lane sign • Install enforcement camera sign • Change certain lane lines into warning lines/solid-cum-broken/double white lines • Widen diverging point edge line marking from 200mm to 300mm • Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	• Strengthen concrete parapets by adding top rails
NT	Cheung Tsing Highway (3 locations)	1. Between Cheung Fai Road and Container Port Road	• Install get-in-lane sign • Change certain lane lines into warning lines • Widen diverging point edge line marking from 200mm to 300mm • Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	• Strengthen concrete parapets by adding top rails

District	Road	Location	Proposed Short-term Enhancement Works	Proposed Long-term Enhancement Works (subject to further simulations and detailed examination)
		2. Near Kam Chuk Kok	• Strengthen thrie-beam barriers by adding rails at the back • Add crash cushion at diverging nosing. • Install get-in-lane sign • Widen diverging point edge line marking from 200mm to 300mm • Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	• Strengthen concrete parapets by adding top rails
		3. Near Kam Chuk Kok	• Strengthen thrie-beam barriers by adding rails at the back • Add crash cushion at diverging nosing • Install get-in-lane sign • Widen diverging point edge line marking from 200mm to 300mm • Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	
NT	Lion Rock Tunnel Road, section between Kak Tin and Fung Shing Court	Between Kak Tin and Fung Shing Court	• Replace corrugated beam barriers by thrie-beam barriers with additional rails at the back • Change certain lane lines into warning lines • Add edge line marking • Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	

District	Road	Location	Proposed Short-term Enhancement Works	Proposed Long-term Enhancement Works (subject to further simulations and detailed examination)
NT	North Lantau Highway (2 locations)	1. Tsing Chau Tsai	• Add crash cushion at diverging nosing. • Widen diverging point edge line marking from 200mm to 300mm • Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	• Strengthen concrete parapets by adding top rails
		2. Section connecting Tung Chung and Airport Railway at Chek Lap Kok Airport	• Add thrie-beam barriers in front of part of parapets • Add crash cushion at diverging nosing • Install get-in-lane sign • Change certain lane lines into warning lines • Widen diverging point edge line marking from 200mm to 300mm • Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	• Strengthen concrete parapets by adding top rails
K	Ching Cheung Road (2 locations)	1. Near Yee Kuk West Street	• Add thrie-beam barriers in front of concrete parapets • Change certain lane lines into warning lines/solid-cum-broken/double white lines • Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	• Strengthen concrete parapets by adding top rails
		2. Near Yu Chau West Street	• Add thrie-beam barriers in front of concrete parapets • Change certain lane lines into warning lines/solid-cum-broken/double white lines	• Strengthen concrete parapets by adding top rails

District	Road	Location	Proposed Short-term Enhancement Works	Proposed Long-term Enhancement Works (subject to further simulations and detailed examination)
			• Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	
K	Kwun Tong Bypass	Slip road connecting Lei Yue Mun Road	• Install sharp deviation signs • Change certain lane lines into solid-cum-broken/double white lines • Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	• Strengthen concrete parapets by adding top rails
K	Kwai Chung Road	Section fronting Mei Foo Sun Chuen	• Add temporary posts and rails at steel parapets • Change certain lane lines into solid-cum-broken/ double white lines • Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	• Replace existing parapets with new and stronger parapets
K	Lung Cheung Road near Tai Wo Ping Interchange	Near Tai Wo Ping Interchange	• Install speed limit sign • Change certain lane lines into solid-cum-broken/double white lines • Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	• Strengthen concrete parapets by adding top rails
HK	Shek Pai Wan Road (2 locations)	Between Wah Fu Road and Sewage Treatment Works	• Replace corrugated beam barriers by thrie-beam barriers with additional rails at the back • Add temporary posts and rails to steel parapets	• Replace and extend existing steel parapets with new and stronger parapets.

District	Road	Location	Proposed Short-term Enhancement Works	Proposed Long-term Enhancement Works (subject to further simulations and detailed examination)
			• Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	
HK	Island Eastern Corridor	Section between Victoria Park Road and Healthy Street West	• Install sharp deviation signs • Widen diverging point edge line marking from 200mm to 300mm • Add speed limit marking • Check road markings/traffic signs/ reflective road studs and repaint/replace faded ones	• Strengthen concrete parapets by adding top rails