Route 10 – North Lantau to Yuen Long Highway Section between North Lantau to So Kwun Wat

PURPOSE

This paper informs Members of the Route 10 – North Lantau to Yuen Long Highway (NLYLH) project, especially the provision of link roads at Siu Lam and So Kwun Wat.

BACKGROUND OF ROUTE 10 (NLYLH)

2. Route 10 (NLYLH), a proposed dual 3-lane highway of about 12.8 km long, will connect Lam Tei in North West New Territories to Northeast Lantau via So Kwun Wat and Tsing Lung Tau. A site plan of the route is at **Annex A**.

3. Route 10 (NLYLH) will perform the following functions –

(a) to provide an alternative external road link for Lantau and the airport;

- (b) to meet anticipated population and employment growth in north-west New Territories; and
- (c) to meet forecast traffic demand generated by cross boundary activities.

4. The route comprises the following sections –

- (a) Southern Section (8.3 km) From North Lantau to So Kwun Wat
- (b) Northern Section (4.5 km) From So Kwun Wat to Lam Tei
- (c) Two link roads to connect Tuen Mun Road
 - (i) dual-2 So Kwun Wat Link Road which connects R10 (NLYLH) to Tuen Mun Road at So Kwun Wat, for vehicles to enter or leave the Southern Section; and

(ii) dual-2 Siu Lam Link Road which connects R10 (NLYLH) to Tuen Mun Road at Siu Lam, for vehicles to enter or leave the Northern Section.

THE NEED FOR CONNECTIONS BETWEEN ROUTE 10 (NLYLH) AND TUEN MUN ROAD

5. It is fundamental to the design of new trunk routes that connections with adjacent or intersecting routes are provided to enhance the utility of the route. In the case of Route 10 (NLYLH), which runs in a north-south direction to the east of Tuen Mun Road before crossing it at Tsing Lung Tau, an interchange between Route 10 (NLYLH) and Tuen Mun Road would allow traffic from Route 10 (NLYLH) to access Tsuen Wan and Kowloon.

6. Highways Department commissioned a Feasibility Study in 1995, which examined several possible corridors for the Route 10 (NLYLH) mainline. This study found that an interchange with Tuen Mun Road was so important that it was one of the principal determining factors in the selection of the optimal corridor for Route 10 (NLYLH). Two interchange options were considered with Tuen Mun Road, one at Tsing Lung Tau, and the other at So Kwun Wat. At Tsing Lung Tau the consultant concluded that a connection with Tuen Mun Road was not feasible. The Study finally recommended that the necessary movements should be provided by means of a link road through the So Kwun Wat valley instead.

7. Highways Department subsequently commissioned the Investigation and Preliminary Design Assignment of Route 10 (NLYLH) in 1998. The intention of this study was to refine the alignment and to examine in more detail the predicted traffic demands, and to consider the expected impacts of the route on the environment and the current drainage regime. Traffic studies have indicated a considerable demand for the link in the So Kwun Wat valley. In 2016, the demand predicted was in the order of 2500 passenger car units in each direction, requiring a dual 2-lane link.

INVESTIGATIONS INTO THE POSSIBLE LOCATIONS FOR THE ROUTE 10 (NLYLH) / TUEN MUN ROAD CONNECTION

8. HyD has looked into the possible locations for the connection with Tuen Mun Road at three locations, including So Kwun Wat, Siu Lam and Tsing Lung Tau. Details of the considerations are set out in the ensuing paragraphs.

So Kwun Wat

9. The Feasibility Study conducted prior to the Investigation and Preliminary Design Assignment had recommended that one single link be provided between Route 10 (NLYLH) and Tuen Mun Road in the So Kwun Wat valley. Provision of a link across the So Kwun Wat valley is feasible, but there were a number of difficulties with the Feasibility Study alignment. The location of the link road ran diagonally across the floor of the valley and occupied much of the developable land, sterilising a residential site at the western end of the valley. The route also infringed designated Village area necessitating major land resumptions and village relocation. Other major constraints included the property developments to the west of the valley, WSD facilities and a fung shui hill at the eastern end of the valley. Location of the link on embankment across both the valley and the major stream courses had significant drainage impacts. There were also technical difficulties in achieving acceptable highway design standards for certain movements, especially the northward movement from the link road onto Route 10 (NLYLH), and the southward movement onto Tuen Mun Road from the link.

10. Modification of the Feasibility Study scheme was considered, but the resultant scheme still could not achieve the minimum design standards for a road of this nature and therefore failed to overcome the major shortcomings of the Feasibility Study scheme.

11. For this reason an alternative alignment was developed (Annex B). The So Kwun Wat Link Road was relocated north onto the slopes of the valley away from developable areas. In this location the link road also has a much lesser impact on existing properties, and because it is supported on viaduct it has no significant adverse drainage impact on the valley. The detailed investigation of environmental impacts carried out in the environmental impact assessment has concluded that with appropriate mitigation measures the impact could meet the established standards.

Siu Lam

12. With the So Kwun Wat Link Road relocated to the north, the northbound connections from the link road to Route 10 (NLYLH) could not be provided due to site constraint and has to be relocated. These connections were replaced by means of a new link, the Siu Lam Link Road. Studies showed that for north-south movements between Route 10 and Tuen Mun Road, travel distance could be reduced by 2.4 km. This resulted in substantial savings in

journey time, as well as a reduction in traffic flows along Tuen Mun Road between So Kwun Wat and Siu Lam. At the same time it achieved the desirable design standards.

13. The Siu Lam Link Road was developed during the Investigation and Preliminary Design Assignment following a review of constraints in the Siu Lam area. The constraints were considerable. They include the WSD tunnels and reservoirs, the development at Siu Lam and the Marine Police Base, amongst others. The proposed Siu Lam Link Road met all design criteria for highway standards, and in addition, it provides a bypass relieving the traffic on Tuen Mun Road between So Kwun Wat and Siu Lam.

Tsing Lung Tau

14. The area of Tsing Lung Tau where the Tsing Lung Bridge will cross the Tuen Mun Highway is highly constrained by existing developments, existing land features and the proposed locations of tunnel portal, Tsing Lung Bridge anchorage and the bridge tower.

15. An interchange at Tsing Lung Tau or any form of connections there was considered not feasible. This was due to the limited space and difficult terrain at the Tsing Lung Tau area. Furthermore, construction work would involve extensive earthwork requiring lane closures on the Tuen Mun Road to mitigate against risk of falling boulders. The interchange will be very close to existing properties causing severe environmental impacts. Most of the slip roads would be in tunnel and will have to be designed to sub-standard highway geometry with steep gradients and tight radii which will be hazardous to motorists. In view of unsafe designs, disruptions to Tuen Mun Road and environmental concerns, construction of an interchange at Tsing Lung Tau was considered not feasible.

TRAFFIC IMPACT ON TUEN MUN ROAD WITH THE PROVISION OF THE LINK ROADS

16. There is a misconception that the proposed Siu Lam Link Road will feed in more traffic onto the already congested section of Tuen Mun Road at Siu Lam. Much of the traffic in the Siu Lam Link Road is in fact diverted from Tuen Mun Road, and is therefore not injecting additional traffic onto Tuen Mun Road at Siu Lam. The addition of Tsing Lung Bridge will provide relief to Tuen Mun Road for traffic from North West New Territories to Lantau.

17. According to the 2016 AM peak traffic forecast for the recommended scenario, the eastbound traffic flow between Siu Lam and Ting Kau is about 6500 pcus. This has taken into account the traffic flow of about 2500 pcus joining and 1800 pcus leaving Tuen Mun Road via Siu Lam Link Road and So Kwun Wat Link Road respectively. Tests have shown no significant increase in traffic on Tuen Mun Road east of Siu Lam Link Road after the completion of Route 10. The conditions so forecast for this section of Tuen Mun Road are quite close to the existing traffic conditions in terms of morning peak hour throughput.

OBJECTIONS TO THE GAZETTED SCHEME

18. The Southern Section of Route 10 (NLYLH) was gazetted under the Roads (Works, Use and Compensation) Ordinance on 28 July 2000. During the objection period, 577 objection letters were received. Most of the objections were from the residents of Palatial Coast. Since receiving the objections, Highways Department has been contacting the objectors in order to clarify any misunderstanding that may exist on the proposed scheme and to ascertain whether the objectors are willing to withdraw their objections. To address the concerns of the residents of the Palatial Coast, HyD has agreed with the residents to hold monthly meeting to address their concerns over the proposed Siu Lam Link Road. Highways Department is prepared to adopt less than desirable standards for the design of the link road. Four options are now being studied, which include shifting of the alignment and lowering the level of the road.

REVIEW OF THE SIU LAM LINK ROAD (SLLR)

19. Details of the four alternative options being studied are shown in Figures Nos. 596/RPT/H301 to 596/RPT/H304 attached at **Annex C**. They are briefly described as follows.

Option 1 - Western Realignment (Figure No. 596/RPT/H301)

20. This realignment follows the existing SLLR horizontal alignment except where it passes in front of Grand Pacific Views (GPV) of Palatial Coast and over Tuen Mun Road. Here the level of the SLLR has been dropped from 43mPD in the gazetted scheme to 25mPD, and the alignment shifted a further 35m away from GPV. This will further reduce visual, noise and air quality

impacts. The horizontal realignment increases the distance of the link road from the front of GPV to about 200m. On the western side the distance from GPV remains at about 125m. The reduced SLLR level results in deeper cut slopes to the west of GPV which would make the SLLR less visible to the residents of Grand Pacific Heights (GPH) of Palatial Coast.

Option 2 – Western Underpass (Figure No. 596/RPT/H302)

21. This option follows a similar route to Option 1, but is a more exaggerated realignment. It diverges vertically from the existing alignment as it passes in front of the Marine Police Base and GPV. Here the level of the SLLR has also been dropped from 43mPD to 25mPD. It passes over Tuen Mun Road in an arc which shifts the SLLR by up to 90m west of the gazetted alignment and into the adjacent hillside. The minimum distance of the link from GPV is about 200m. The link passes into tunnel to the west of GPH, exiting in a cutting 30m deep, which further reduces visibility from GPH.

Option 3 – Eastern Underpass (Figure No. 596/RPT/H303)

22. This alignment passes east of GPV under the Siu Lam Hospital after first passing over the Siu Lam interchange at a high level. Only one crossing of Tuen Mun Road is required. Clearance under the WSD access road to the north of the hospital is minimal and this section would have to be constructed as a cut and cover tunnel, with temporary road diversions. North of the WSD access road and opposite GPV/GPH, the alignment is on a viaduct for 100m across a valley after which it is at grade, with retaining walls on the hillside. At this point the alignment is about 120m from GPH. Visual impact would be mitigated by bunding, plantings and landscaping. A noise barrier would be required. At the northern end of GPH the alignment passes onto viaduct across the Siu Lam valley, passing onto both sides of the Route 10 mainline and into underpasses before merging with the mainline.

Option 4 – Eastern Tunnel (Figure No. 596/RPT/H304)

23. The eastern tunnel option diverges from the existing SLLR alignment at the Tai Lam nullah. It passes north-west over Castle Peak Road on a bridge, and then into tunnel between the Siu Lam Prison and Hospital at a lower level than Option 3. Only a single crossing of Tuen Mun Road is required. Vertical clearance above Castle Peak Road is minimal. Notwithstanding this a steep gradient is required on the southbound SLLR carriageway between the tunnel south portal and the junction with Tuen Mun Road. The tunnel portal is very close to the security walls of the Siu Lam facility. The alignment is visible to blocks 9 and 10 of GPH which are about 125m away. After crossing the Siu Lam valley on viaduct it passes onto either side of the Route 10 mainline and into underpasses before merging with the mainline.

24. The above four options are developed with a view to accommodating the concerns of the residents of the Palatial Coast as far as possible. These were presented to the Tuen Mun District Council (TMDC) at its special meeting held on 5 December 2000. The members of the TMDC in general supported the Option 2. These options will be presented to the residents in February 2001 and their comments will be incorporated as far as possible.

ADVICE SOUGHT

25. Members are invited to note the content of this paper.

Transport Bureau February 2001 Annex A Route 10 - North Lantau to Yuen Long Highway

> 附件一 十號幹線 - 北大嶼山至元朗公路



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A4 210 x 297

Annex B So Kwun Wat Link Road

> 附件二 掃管笏連接路



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Annex C Siu Lam Link Road Alternative Alignments

> 附件三 小欖連接路替代方案







