

## ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

### HEAD 706 – HIGHWAYS

#### Transport – Roads

#### 884TH – Route 11 (section between Yuen Long and North Lantau)

Members are invited to recommend to Finance Committee –

- (a) the upgrading of part of **884TH** to Category A as **885TH** “Route 11 (section between Yuen Long and North Lantau) – investigation study” at an estimated cost of \$319.0 million in money-of-the-day prices; and
- (b) the retention of the remainder of **884TH** in Category B.

### PROBLEM

We need to construct Route 11 (section between Yuen Long and North Lantau) (Route 11) to connect the Northwest New Territories (NWNT) to the urban areas to meet the traffic demand arising from the progressive development of the NWNT, which includes Hung Shui Kiu/Ha Tsuen New Development Area (NDA), Yuen Long South Development etc, and to improve the traffic conditions of major roads connecting the urban areas with the NWNT (including Tuen Mun Road, Tai Lam Tunnel and Ting Kau Bridge). With the improved road infrastructure, development potential of relevant areas can be unleashed effectively.

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## PROPOSAL

2. The Director of Highways, with the support of the Secretary for Transport and Housing, proposes to upgrade part of **884TH** to Category A as **885TH** at an estimated cost of \$319.0 million in money-of-the-day (MOD) prices to engage consultants to undertake the investigation for Route 11.

## PROJECT SCOPE AND NATURE

3. Subject to the results of the investigation study, the scope of **884TH** comprises –

- (a) construction of a dual three-lane Lam Tei Tunnel of approximately 4.2 kilometres (km) long connecting Lam Tei and So Kwun Wat, which connects to Kong Sham Western Highway and Yuen Long Highway at Lam Tei, and Tai Lam Chung Tunnel and So Kwun Wat Link Road at So Kwun Wat;
- (b) construction of a dual four-lane Tai Lam Chung Tunnel of approximately 1.7 km long connecting So Kwun Wat and Tsing Lung Tau, which connects to Lam Tei Tunnel and So Kwun Wat Link Road at So Kwun Wat, and Tsing Lung Bridge and Tuen Mun Road at Tsing Lung Tau;
- (c) construction of a dual three-lane Tsing Lung Bridge of approximately 1.4 km long connecting Tsing Lung Tau and North Lantau, which connects to Tai Lam Chung Tunnel and Tuen Mun Road at Tsing Lung Tau, and Lantau Link, North Lantau Highway and the proposed Tsing Yi-Lantau Link at North Lantau;
- (d) construction of a dual two-lane So Kwun Wat Link Road of approximately 2.9 km long, in which about 1.3 km is in the form of a tunnel, connecting Lam Tei Tunnel, Tai Lam Chung Tunnel and Tuen Mun Road;
- (e) construction of the connecting roads, interchanges and slip roads for the above road sections; and

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- (f) the associated building, civil, structural, electrical and mechanical, environmental and other related works, establishment of traffic control and surveillance system (TCSS), etc.

———— The layout plan of the preliminary alignment of Route 11 is at Enclosure 1. The layout plan also shows the preliminary alignments of Tsing Yi-Lantau Link and the widening of Yuen Long Highway (section between Lam Tei and Tong Yan San Tsuen).

4. The part of **884TH** (i.e. **885TH**) proposed to be upgraded to Category A comprises –

- (a) the investigation of Route 11, comprising –
  - (i) a review of the findings of previous studies and examination of alignments and design options; and
  - (ii) impact assessments on environment, traffic, heritage, land and other related aspects;
- (b) preliminary design of Route 11; and
- (c) associated site investigations and works supervision.

5. We plan to commence the proposed investigation study (the Study) upon obtaining funding approval from the Finance Committee (FC) for target completion in around 54 months. The details and anticipated durations of the major tasks under the investigation study are shown in Enclosure 2. With a view to completing the Study as soon as possible, the Highways Department will carry out the tasks of the investigation study concurrently as far as possible.

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6. In order to collect the views of the various stakeholders as soon as possible to optimise the engineering scheme, and to prevent abortive detailed design work, the Highways Department will commence and complete the statutory procedures involving the public related to the Environmental Impact Assessment Ordinance and the Roads (Works, Use and Compensation) Ordinance during the Study. Based on previous experience in the implementation of major transport infrastructure, when setting a 54-month investigation study, the Highways Department set aside about 24 months for handling public views collected in the statutory procedures. If the statutory procedures could be completed earlier than anticipated, the Highways Department will proceed to the detailed design and construction of the project as soon as possible. At the same time, in the tendering stage of the Study, the Highways Department will invite the tenderers to suggest a shorter study programme, and measures to expedite the Study, so as to shorten the time required for the investigation study.

7. In addition, the Highways Department and the consultants will consider factors such as overall traffic benefits, time and resources required for implementation, etc. in the Study to determine the commissioning priority, modes of implementation and contractual arrangements for the different sections of Route 11, so as to ensure that the project can be progressively completed and commissioned as soon as possible.

## **JUSTIFICATION**

8. To meet the traffic demand arising from the progressive development in the NWNT (including the Hung Shui Kiu/Ha Tsuen NDA and the Yuen Long South Development), the Government commenced a feasibility study on Route 11 in May 2018 to comprehensively assess the traffic benefits, engineering technical feasibility, land acquisition, preliminary environmental impact and project implementation programme, etc. of the various alignment options. The feasibility study established the preliminary alignment of Route 11, and confirmed its benefits and engineering feasibility. It also established the need for constructing a Tsing Yi-Lantau Link and widening a section of Yuen Long Highway between Lam Tei and Tong Yan San Tsuen, and explored the associated transport proposals.

/9. ....

9. Based on the findings of the feasibility study on Route 11, the Government is planning to implement a group of major roads from Lam Tei to Tsing Yi, routing through So Kwun Wat, Tai Lam Chung and North Lantau, which comprises Route 11 (which includes Lam Tei Tunnel, Tai Lam Chung Tunnel, Tsing Lung Bridge and So Kwun Wat Link Road), Tsing Yi-Lantau Link, and the widening of Yuen Long Highway (section between Lam Tei and Tong Yan San Tsuen). The entire group of strategic roads connecting the NWNT to the urban areas can bring overall traffic benefits. Apart from improving the traffic conditions of major roads connecting the NWNT with the urban areas (including Tuen Mun Road, Tai Lam Tunnel and Ting Kau Bridge), it can also, by improving road infrastructure, further strengthen the connectivity of major roads and enhance the capacity of interchanges, strengthen the connectivity of developments in the vicinity, and unleash the development potential of the relevant areas effectively. The layout plan of the preliminary alignment of the entire group of proposed major roads mentioned above is at Enclosure 1.

10. The proposed major roads will each serve a unique function and will balance the overall layout of the major routes plying between the NWNT and the urban areas. Lam Tei Tunnel will connect to Kong Sham Western Highway and Yuen Long Highway via the proposed Lam Tei Quarry Interchange, which is in the middle between Yuen Long and Tuen Mun districts, and is roughly equidistant from the centres of Hung Shui Kiu/Ha Tsuen NDA and Yuen Long South Development. This alignment can benefit the residents of Yuen Long and Tuen Mun, and can reduce the projected traffic loadings of Tuen Mun Road and Tai Lam Tunnel. So Kwun Wat Link Road and Tai Lam Chung Tunnel will serve as an alternative route for the section of Tuen Mun Road between So Kwun Wat and Tsing Lung Tau, and can provide reserve traffic capacity for future developments in the relevant areas. Tsing Lung Bridge and Tsing Yi-Lantau Link, which are cross-harbour bridges, will form an express trunk road to the urban areas via Lantau and Tsing Yi, bypassing the relatively busy roads such as Ting Kau Bridge.

11. With a view to further enhancing the connection between Route 11 and the development areas in Yuen Long South etc., the Highways Department plans to widen a section of Yuen Long Highway adjacent to the proposed Lam Tei Quarry Interchange, preliminarily set between the proposed Lam Tei Quarry Interchange and Tong Yan San Tsuen Interchange. Together with the road and interchange improvement works associated with the development areas in Yuen Long South etc. at Tin Shui Wai West Interchange, Tong Yan San Tsuen Interchange, Shap Pat Heung Interchange and Pok Oi Interchange, the entire road network in the relevant areas could be enhanced comprehensively, and the local traffic in Yuen Long areas will not be affected by cross-district traffic.

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12. Based on the preliminary alignment and assessments of the feasibility study, the Study is to further determine the alignment, overall layout, preliminary design proposal and land requirements of Route 11. We will carry out the relevant impact assessments in the Study, including an environmental impact assessment (EIA) and matters relating to the preservation of cultural heritage, with a view to identifying the impacts and the required mitigation measures. We will also carry out site investigation works to gather geotechnical and geological information for the related design works.

13. Route 11 is closely related to Tsing Yi-Lantau Link and the widening of Yuen Long Highway (section between Lam Tei and Tong Yan San Tsuen). To enable timely implementation of Tsing Yi-Lantau Link and the widening of Yuen Long Highway (section between Lam Tei and Tong Yan San Tsuen), the Highways Department will commence the public works procedures for Category D items under block allocation **Head 706 Subhead 6100TX** to commission an engineering study of Tsing Yi-Lantau Link and an investigation study of the widening of Yuen Long Highway (section between Lam Tei and Tong Yan San Tsuen) in parallel, and proceed with the subsequent stages of the projects at appropriate times based on the findings of these studies, with a target to commissioning the entire group of major roads (including Route 11, Tsing Yi-Lantau Link and the widening of Yuen Long Highway (section between Lam Tei and Tong Yan San Tsuen)) not later than 2036.

### Benefits

14. Based on the forecast of the traffic impact assessment<sup>1</sup> conducted under the feasibility study on Route 11, in the absence of Route 11 and the associated major roads, the volume/capacity (v/c) ratio<sup>2</sup> for Tuen Mun Road (Siu Lam Section and Sham Tseng Section) and Tai Lam Tunnel during morning peak hours in 2036 will reach 1.2. The v/c ratio for Ting Kau Bridge and Lantau Link during morning peak hours in 2036 will reach 1.1.

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<sup>1</sup> The traffic impact assessment adopted the 2016-based Territorial Population and Employment Data Matrix compiled by the Planning Department in 2019.

<sup>2</sup> A volume to capacity (v/c) ratio is used to reflect the traffic situation during peak hours. A v/c ratio less than 1.0 means the situation is acceptable. A v/c ratio above 1.0 indicates the onset of mild congestion and a v/c ratio between 1.0 and 1.2 indicates a manageable degree of congestion. A v/c ratio higher than 1.2 means the congestion is getting serious.

15. Route 11 and the associated major roads, if commissioned not later than 2036, can provide an alternative route with reserve capacity connecting the NWNT and the urban areas. We anticipate that the v/c ratios for Tuen Mun Road (Siu Lam Section), Tai Lam Tunnel, Ting Kau Bridge and Lantau Link during morning peak hours in 2036 will be reduced to 1.0 or below. For Tuen Mun Road (Sham Tseng Section), the v/c ratios for the bus-only lane and the non-bus-only lanes will be lower than 1.0 and reduced to 1.1 respectively. After Route 11 and the major roads have been commissioned, the Government will review the traffic arrangements of the relevant roads to divert as far as possible the vehicles using Tuen Mun Road to the routes with higher reserve capacity. The v/c ratios for the major roads connecting the NWNT with the urban areas during morning peak hours in 2036 are shown in Enclosure 3.

16. With the improved traffic conditions of major roads between the NWNT and the urban areas (including Tuen Mun Road, Tai Lam Tunnel and Ting Kau Bridge), a more direct connection brought about by Route 11 and the associated major roads to residents in the NWNT, and shorter travelling distance for some trips, we anticipate that the travelling time from the NWNT to the urban areas can be reduced by about 10 minutes<sup>3</sup> in 2036.

17. Route 11 and Tsing Yi-Lantau Link will provide an alternative route for commuting between the NWNT and the urban areas, and will strengthen the resilience to traffic incidents of the NWNT traffic network. In the event that there are major emergencies on major roads connecting the NWNT and the urban areas (such as Tuen Mun Road, Tai Lam Tunnel or Ting Kau Bridge), with the various accesses and connections to major roads in the NWNT, Route 11 and Tsing Yi-Lantau Link could serve as a reliable alternative route for diverting the traffic towards the urban areas. Besides, Route 11 and Tsing Yi-Lantau Link will also serve as an additional strategic route connecting the NWNT and Lantau, strengthening the resilience to traffic incidents of the road network connecting to the airport.

## FINANCIAL IMPLICATIONS

18. We estimate the capital cost of the Study to be \$319.0 million in MOD prices, which includes the expenditure on the associated site investigation works, broken down as follows –

/(a) .....

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<sup>3</sup> The possible reduction in travelling time depends on the following factors: starting point in the NWNT, destination in the urban areas, original travelling route in the absence of Route 11 and associated major routes, and the time of day for the trips.

		<b>\$ million (in MOD prices)</b>
(a)	Consultants' fees	169.0
(i)	a review of the findings of previous studies and examination of alignments and design options	25.3
(ii)	assessments of impacts on environment, traffic, heritage, land and other related aspects	59.2
(iii)	preliminary design of Route 11	67.6
(iv)	supervision of site investigation works	16.9
(b)	Site investigation	121.3
(c)	Contingencies	<u>28.7</u>
Total		<u>319.0</u>

In view of the complexity and multi-disciplinary nature of the investigation study, we plan to engage consultants to undertake the Study and supervise the associated site investigation works. The basis for the estimate of the consultants' fees is at Enclosure 4.

19. Subject to funding approval, we plan to phase the expenditure as follows –

/Year .....



Year	\$ million (in MOD prices)
2021 – 22	14.1
2022 – 23	59.5
2023 – 24	93.7
2024 – 25	82.0
2025 – 26	51.7
2026 – 27	18.0
	<hr/>
	319.0
	<hr/>

20. We have derived the MOD estimate on the basis of the Government's latest set of assumptions on the trend rate of change in the prices of public sector building and construction output for the period 2021 to 2027. We will engage consultants to undertake the Study on a lump sum basis. We will tender the proposed site investigation works under a standard re-measurement contract because the quantity of works involved may vary depending on actual ground conditions.

21. The Study and the associated site investigation will have no recurrent financial implication.

## **PUBLIC CONSULTATION**

22. The concerned departments consulted the Traffic and Transport Committee (T&TC) of Tuen Mun District Council (DC), the T&TC of Tsuen Wan DC and Islands DC on 8 February 2021, and Yuen Long DC on 23 February 2021 regarding Route 11 and the associated major roads.

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23. The DCs provided comments on the preliminary alignment, environmental impact and land requirements of Route 11. The concerned departments explained to the members the rationales for the preliminary alignment, and the EIA and other statutory consultations to be conducted during the investigation stage. Besides, Tuen Mun DC wished that the Government could smoothly implement and complete the Route 11, such that Tuen Mun could benefit from the traffic improvement. Tsuen Wan DC and Islands DC did not object the alignment of Route 11 nor the implementation of the next stage of Route 11. For Yuen Long DC, despite clear explanations by the concerned departments that Route 11 was not related to the “Lantau Tomorrow Vision” (LTV), members still did not support the implementation of Route 11 given the possible future connection at North Lantau with the artificial islands in the Central Waters, and a lack of direct connection between Route 11 and Yuen Long South (particularly Tai Tong).

24. We noted the DCs’ comments on Route 11 and would follow up the comments on the project in the investigation study as appropriate.

25. We consulted the Legislative Council Panel on Transport about the Study on 19 March 2021. Members generally supported the implementation of Route 11. We provided supplementary information to the Legislative Council Panel on Transport on 29 April 2021 (LC Paper No. CB(4)914/20-21(01)). In addition, some members wanted at the meeting to have further details of the investigation study and the Government’s measures for the improvement to the traffic conditions in Tuen Mun and Yuen Long in the discussion paper for the Public Works Subcommittee. The details of the major tasks in the investigation study and the anticipated durations and costs are provided in this document. As aforementioned in this paper, we will commence and complete the required procedures during the Study, so as to expedite the implementation of the project. Moreover, we will confirm the feasibility of constructing the project in stages, such that the project could be completed as soon as possible. Measures other than Route 11 and the associated major roads to improve the traffic conditions in Tuen Mun and Yuen Long are in Enclosure 5.

## **ENVIRONMENTAL IMPLICATIONS**

26. The proposed Route 11 is a designated project under Schedule 2 of the EIA Ordinance (EIAO), and an environmental permit is required for the construction and operation of Route 11. We will conduct an EIA study to comply with the requirements of the EIAO. The EIA study will assess the environmental impacts arising from the proposed works, and it will cover the aspects of air quality, water quality, ecology, fisheries, cultural heritage, noise, landscape and visual impact, etc.. Nevertheless, the Study itself is not a designated project and will not cause any long-term adverse environmental impact. We have included in the

/project .....

project estimates the cost of implementing suitable pollution control measures to mitigate short-term environmental impacts arising from the site investigation works under the Study.

27. The Study and site investigation works will only generate minimal construction waste. We will require the consultants to fully consider measures to minimise the generation of construction waste and to reuse or recycle construction waste as much as possible in the future implementation of the construction works.

## **HERITAGE IMPLICATIONS**

28. The Study and the associated site investigation works will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites and buildings, sites of archaeological interest and government historic sites identified by the Antiquities and Monuments Office. We will conduct cultural heritage impact assessment under the EIA study of the Study, and recommend the appropriate mitigation measures if necessary.

## **LAND ACQUISITION**

29. The Study and the associated site investigation works will not require any land acquisition. The Study will examine the need and extent of land acquisition and/or clearance required for the proposed Route 11.

## **BACKGROUND INFORMATION**

30. The Government reviewed in 2015 the overall long-term external traffic demands of the NWNT and considered there was a need to study the feasibility of Route 11. We obtained funding approval from the FC of the Legislative Council in April 2018 and commenced the feasibility study on Route 11 in May 2018. We basically completed the feasibility study in late 2020, and upgraded **884TH** to Category B in October 2020.

31. The Study and the associated site investigation works will not directly involve any tree removal or planting proposals. The Study will examine the impacts to trees during construction, the need for tree preservation and tree planting proposals.

32. We estimate that the investigation study and the associated site investigation works will create about 60 jobs (35 for labourers and 25 for professional or technical staff)<sup>4</sup> providing a total employment of 1 500 man-months.

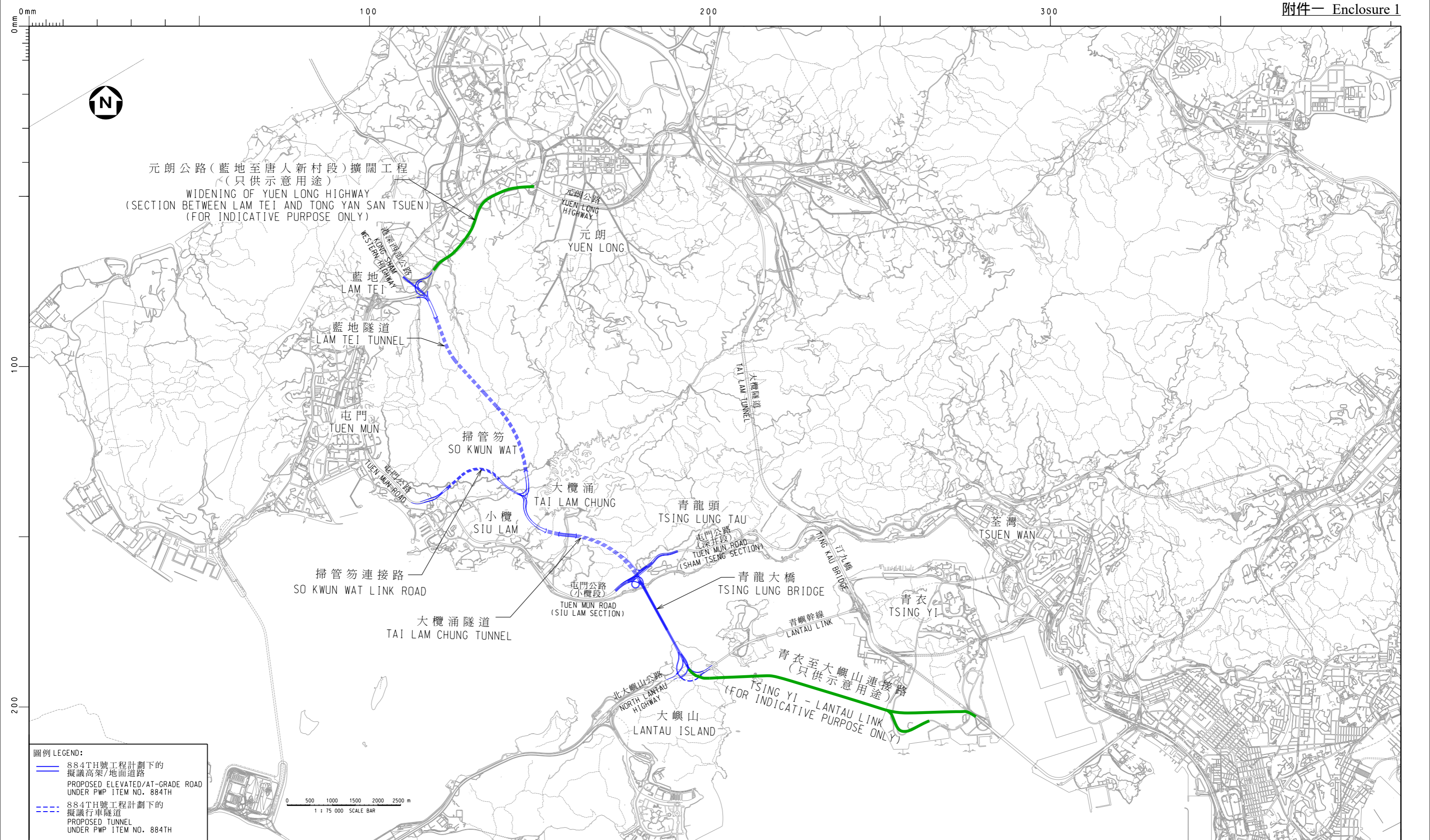
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Transport and Housing Bureau  
May 2021

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<sup>4</sup> The jobs for labourers to be created will mainly be responsible for carrying out site investigation works and the jobs for professional/technical staff to be created will mainly be responsible for carrying out the investigation study and supervising the associated site investigation works.





元朗公路(藍地至唐人新村段)擴闊工程  
(只供示意用途)  
WIDENING OF YUEN LONG HIGHWAY  
(SECTION BETWEEN LAM TEI AND TONG YAN SAN TSUEN)  
(FOR INDICATIVE PURPOSE ONLY)

掃管笏連接路  
SO KWUN WAT LINK ROAD

大欖涌隧道  
TAI LAM CHUNG TUNNEL

青衣至大嶼山連接路  
(只供示意用途)  
TSING YI - LANTAU LINK  
(FOR INDICATIVE PURPOSE ONLY)

圖例 LEGEND:  
 — 884TH號工程計劃下的  
擬議高架/地面道路  
PROPOSED ELEVATED/AT-GRADE ROAD  
UNDER PWP ITEM NO. 884TH  
 - - - 884TH號工程計劃下的  
擬議行車隧道  
PROPOSED TUNNEL  
UNDER PWP ITEM NO. 884TH

0 500 1000 1500 2000 2500 m  
1 : 75 000 SCALE BAR

圖則名稱 drawing title

十一號幹線(元朗至北大嶼山段)及相關主要幹道的初步走線平面圖

LAYOUT PLAN FOR PRELIMINARY ALIGNMENT OF ROUTE 11 (SECTION BETWEEN YUEN LONG AND NORTH LANTAU) AND ASSOCIATED MAJOR ROADS

圖則編號 drawing no. HMW6870TH-SK0040 比例 scale 1:75000

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HIGHWAYS DEPARTMENT HONG KONG 路政署

## **Route 11 (section between Yuen Long and North Lantau) – Investigation Study Content**

Route 11 (section between Yuen Long and North Lantau) (Route 11) – Investigation (the Study) is to determine the alignment, overall layout, preliminary design proposal and land requirements of Route 11. We will carry out a number of impact assessments in the Study, covering environment, traffic, marine, drainage, water supplies, utilities, sustainability, etc. We will also carry out site investigation works to gather geotechnical and geological information for the related design works. We will gazette the road scheme according to Road (Works, Use and Compensation) Ordinance and conduct public consultation to collect the views of different stakeholders for optimising the engineering scheme.

### **Review of the Findings of Previous Studies**

2. During the initial stage of the Study, we will review the findings of the feasibility study and formulate a recommended alignment as a basis for conducting impact assessments. This task is expected to take about 2 months.

### **Impact Assessments**

3. We will carry out various impact assessments and optimise the alignment based on the assessment results, which involve an interactive study process. We will carry out the various impact assessments concurrently as far as possible. The total duration for the impact assessments is about 28 months. The details are as follows:

#### Traffic Impact Assessment

4. We will review and update the preliminary traffic impact assessment carried out under the feasibility study, which includes giving consideration to the latest development parameters and planning of major transport infrastructure, updating the traffic model, testing scenarios, etc. to update the traffic forecast of the project. We will assess the capacities of the associated major roads and interchanges and recommend improvement options. We will also carry out traffic impact assessment for the construction period and formulate appropriate temporary traffic arrangements.

#### Environmental Impact Assessment

5. The proposed Route 11 is a designated project under Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO), and the Highways Department has to apply for an environmental permit for the construction and operation of Route 11. We will conduct an EIA study to comply with the requirements of the EIAO. We will assess the impacts on the environment due to the works, which will cover the aspects of air quality, water quality, ecology, fisheries, cultural heritage, noise, landscape and visual



impacts, etc.. As the portals of the tunnels are close to country parks and Tsing Lung Bridge will span across Ha Pang Fairway, we will carry out ecological and fisheries survey to establish the baseline ecological and fisheries conditions along the alignment and within the study area. We will then further assess the impacts on the ecology and fisheries due to the project. In addition, we will conduct on-site surveys to establish the baseline conditions of air quality and noise level, assess the impacts of the project on air quality and noise level and determine the necessary mitigation measures. Under the statutory requirements of the EIAO, we will make the EIA report available for the public and Advisory Council on Environment to comment.

### Geotechnical Assessment

6. Route 11 comprises tunnels with a total length of about 8 km, a cross-harbour bridge with a length of 1.4 km and other connecting roads, interchanges and associated buildings. Its construction will involve substantial excavation, foundation and slope works. The construction sites will also be scattering at many locations such as Ha Pang Fairway, which may have complicated ground, geological and groundwater conditions. Therefore, we need to carry out land and marine ground investigation and geotechnical assessment to obtain sufficient information for the design work. Geotechnical assessment will review the existing engineering geological data and data obtained from ground investigation, including topography, stratum lithology, stratum structure, unfavourable geology and geotechnical parameters, etc., carry out natural terrain hazard study and tunnel and bridge foundation engineering geological assessment, consolidate design information such as design loading and rock bearing capacity, and tunnel blasting and its impact assessment. The ground investigation works include the determination of the locations of site investigation, applications for temporary government land allocations, the actual site investigation, and sample testing, etc. Some of the ground investigation works will take place in the country park and are anticipated to involve relatively complex planning and arrangements such as transportation of machines, etc.

### Marine Impact Assessment

7. We will make use of information such as the preliminary alignment of Tsing Lung Bridge, height restrictions for the navigation channel of Ha Pang Fairway and the flight path, rate and direction of water flow, tidal changes, and the height of the typhoon surge, etc. to evaluate the structural safety of Tsing Lung Bridge during construction and operation, the impacts on navigation and navigation facilities, and the impacts of marine vessels in the navigation channels on the bridge. The assessment results will be used to determine the foundation works of the bridge towers and ship collision protection facilities to meet the shipping and engineering needs. In addition, we will examine various tower foundation schemes to shorten the construction period and reduce the impact of the project on the navigation channels.

### Other Impact Assessments

8. Other impact assessments include land impact assessment (including the extent of land acquisition required for the project), drainage impact assessment, water supplies impact assessment, utility impact assessment, sustainability assessment, etc.

### **Preliminary Design**

9. After there are preliminary results of the impact assessments (around 8 months after the commencement of the Study), we will carry out the preliminary designs of the various road sections of Route 11 concurrently to pave way for the detailed design in the next stage. These tasks will take about 30 months. The details are as follows:

### Tsing Lung Bridge

10. We will review the overall conceptual design of the bridge (including bridge tower height, bridge deck gradient, air draft, appropriate form and arrangement of the bridge) to determine the spatial location of the bridge, the location of the navigation channels underneath the bridge and the associated requirements on net width and net height, bridge tower foundation and the overall arrangement of the bridge to meet the height restrictions for navigation, aviation, etc., and to match the design of the interchanges on both ends of the bridge. Based on the coastal climate change, geology, traffic impact, marine impact and environmental impact of the bridge site and the relevant design codes and standards, as well as the wind stability analysis and validation by wind tunnel tests, we will carry out preliminary designs of the various bridge components, including suspension cables, bridge decks, bridge towers, anchorages, foundations, ship collision protection facilities, and equipment and facilities for bridge maintenance and management.

### Tunnels and Associated Buildings

11. Based on the findings of the studies such as engineering geology, traffic impact assessment and environmental impact assessment, as well as the relevant design codes and standards, we will carry out the preliminary designs of the tunnels (total length of about 8 km), including cross sections of the tunnels, tunnel wall panels, waterproof layers, road surface, associated electrical and mechanical system, ventilation system, air purification system, fire services system, accesses for evacuation and rescue within tunnels, etc. We will also carry out the preliminary designs (such as appearance, structure, foundation, and building services requirements) of the ventilation buildings, administration buildings and other structures for the operation and maintenance of the tunnels.

### Viaducts and Associated Interchanges

12. Based on the findings of the studies such as engineering geology, traffic impact assessment and environmental impact assessment, as well as the relevant design



codes and standards, we will carry out the preliminary designs of the viaducts (total length of about 4.5 km) and four interchanges at Lam Tei, So Kwun Wat, Tsing Lung Tau and North Lantau respectively, covering appearance, span, gradient, height, sag, structure, foundation, and traffic safety, etc..

### Other Conceptual and Preliminary Design

13. Other conceptual and preliminary design includes traffic control and surveillance system, landscape and streetscape, maintenance strategy, form of operating contract, etc.

### **Review of Alignment and Design Option**

14. Apart from carrying out the EIA study in accordance with EIAO, the road scheme of Route 11 has to be gazetted in accordance with Roads (Works, Use and Compensation) Ordinance. In order to collect the views of the various stakeholders as soon as possible to optimise the engineering scheme, and to prevent abortive detailed design work, we will complete the relevant statutory procedure under the Study. Given the complexity and mega-size of the project that spans multiple districts, the Study will conduct public engagement activities to explain the design scheme to the stakeholders in details, and to collect their views to for deriving the appropriate mitigation measures and to continuously optimise the engineering scheme, in an attempt to solicit public support.

15. As the EIA report has to be substantially completed before proceeding with the gazette, we anticipate that the relevant statutory procedure will commence about 30 months after the commencement of the Study. Based on previous experience in the implementation of major transport infrastructure, we have set aside about 24 months for handling public views collected in the statutory procedures. If the statutory procedures could be completed earlier than anticipated, the Highways Department will proceed to the detailed design and construction of the project as soon as possible. At the same time, in the tendering stage of the Study, tenderers will be invited to suggest a shorter study programme, and measures to expedite the Study, so as to shorten the time required for the investigation study.

16. The Highways Department and the consultants will consider factors such as overall traffic benefits, time and resources required for implementation, etc. in the Study to determine the commissioning priority, modes of implementation and contractual arrangements for the different sections of Route 11, so as to ensure that the project can be progressively completed and commissioned as soon as possible.

**Volume/Capacity Ratios of Major Roads connecting  
the Northwest New Territories to the Urban Areas  
during Morning Peak Hours in 2036**

	Volume/Capacity Ratio	
	Without the Proposed Project <sup>Note 1</sup>	With the Proposed Project
<b>Major Roads</b>		
- Tuen Mun Road (Siu Lam Section)	1.2	1.0
- Tuen Mun Road (Sham Tseng Section)	1.2	1.1 <sup>Note 2</sup>
- Tai Lam Tunnel	1.2	0.7
- Ting Kau Bridge	1.1	0.7
- Lantau Link	1.1	1.0
- Yuen Long Highway (section between Lam Tei and Tong Yan San Tsuen)	1.1	0.9
<b>Route 11</b>		
- Lam Tei Tunnel	/	0.9
- Tai Lam Chung Tunnel		0.8
- Tsing Lung Bridge		0.9
- So Kwun Wat Link Road		0.4
<b>Tsing Yi-Lantau Link</b>		0.7

## Notes

1. The Proposed Project includes Route 11 and associated major roads.
2. This value is the v/c ratio for lanes other than the bus-only lane on Tuen Mun Road (Sham Tseng Section). The v/c ratio for the bus-only lane on Tuen Mun Road (Sham Tseng Section) will be below 1.0, indicating smooth traffic on the bus-only lane.

**885TH – Route 11 (section between Yuen Long and North Lantau) –  
investigation study**

**Breakdown of the estimates for consultants' fees (in September 2020 prices)**

<b>Consultants' fees</b> <sup>(Note 1)</sup>		<b>Estimated man- months</b>	<b>Average MPS* salary point</b>	<b>Multiplier</b> <small>(Note 2)</small>	<b>Estimated fees (\$ million)</b>
(a) a review of the findings of previous studies and examination of alignment and design options	Professional	83	38	2.0	14.3
	Technical	119	14	2.0	7.2
				Sub-total	<u>21.5 #</u>
(b) assessments of the impacts on environment, traffic, heritage, land and other related aspects	Professional	195	38	2.0	33.5
	Technical	278	14	2.0	16.8
				Sub-total	<u>50.3 #</u>
(c) preliminary design of Route 11	Professional	223	38	2.0	38.3
	Technical	318	14	2.0	19.2
				Sub-total	<u>57.5 #</u>
(d) supervision of site investigation works	Professional	55	38	1.6	7.6
	Technical	141	14	1.6	6.8
				Sub-total	<u>14.4 #</u>
				Total	<u><b>143.7 #</b></u>

\* MPS = Master Pay Scale

**Notes**

- The actual man-months and fees will only be known after selection of the consultants through the usual competitive bidding system.
- A multiplier of 2.0 is applied to the average MPS salary point to estimate the full staff costs of consultants' staff, including overhead and profit, as the employed staff will work in the consultants' offices. A multiplier of 1.6 is applied to the average MPS salary point in the case of resident site staff supplied by the consultants. (As at today, MPS salary point 38 = \$85,870 per month and MPS salary point 14 = \$30,235 per month.)

**Remarks**

The figures in this Enclosure are shown in constant prices to correlate with the MPS salary point of the same year. The figures marked with # are shown in money-of-the-day prices in paragraph 18.

## **Traffic Improvement Measures in Tuen Mun and Yuen Long**

### Tuen Mun District

With a view to improving the traffic conditions in Tuen Mun, the Government completed the widening of a section of Tuen Mun Road Town Centre Section between Yan Oi Town Square and Wong Chu Road, and the reconstruction and improvement of Tuen Mun Road. In addition, the Government has planned to commence several traffic improvement works in Tuen Mun, which include traffic improvement works at Lung Fu Road, Wong Chu Road and Hoi Wing Road, to improve the traffic conditions in Tuen Mun. The investigation study and the preliminary design of the relevant traffic improvement works will commence within this year.

2. For the external connectivity of Tuen Mun, apart from the full commissioning of the Tuen Mun-Chek Lap Kok Link on 27 December 2020, the Government is widening the section of Castle Peak Road connecting Kwun Tsing Road to Hoi Wing Road (i.e. the Widening of Castle Peak Road (Castle Peak Bay) project). Together with the other widened sections of Castle Peak Road, the complete Castle Peak Road from Tuen Mun to Tsuen Wan will be upgraded to dual two-lane carriageway, which can meet the traffic demand of the developments along the road and strengthen the external connectivity of the Northwest New Territories (NWNT). The Widening of Castle Peak Road (Castle Peak Bay) project is expected to be completed as early as 2024.

3. Apart from Route 11 and the associated major roads, the Government is actively implementing the Tuen Mun Bypass project. Upon the commissioning of Tuen Mun Bypass, vehicles in the NWNT can go from Yuen Long Highway via Tuen Mun Bypass to Tuen Mun Area 40 directly, and via Tuen Mun-Chek Lap Kok Tunnel to Hong Kong International Airport, Tung Chung and other areas in Lantau. As the vehicles will not have to route through Tuen Mun Road (Fu Tei Section and Town Centre Section), Wong Chu Road and other roads in Tuen Mun, the traffic loading in Tuen Mun will be reduced. The Government plans to commence the investigation study and preliminary design of Tuen Mun Bypass this year. The study will examine the need and feasibility of providing other entry/exit points for Tuen Mun Bypass, and explore how to expedite the implementation of Tuen Mun Bypass. It is currently anticipated that Tuen Mun Bypass will be completed by 2036.

### Yuen Long District

4. The Transport Department and the Police will continue to monitor closely the traffic conditions of Fairview Park Roundabout, Pok Oi Interchange and Shap Pat Heung Interchange during peak hours, and will take appropriate measures such as directing traffics on site. Meanwhile, in response to the recommendations of the local communities, the Transport Department is studying the installation of Journey Time Indication System,

Speed Map Panels and Variable Message Signs in Yuen Long to provide real-time traffic information to help road users select appropriate routes. Based on the traffic conditions, the Transport Department will from time to time review the need to install necessary facilities.

5. Apart from conducting the routine survey for traffic and transport statistics, the Transport Department has already arranged to conduct traffic survey at Fairview Park Roundabout, Pok Oi Interchange and Shap Pat Heung Interchange, and will review whether further improvement measures are necessary.

6. On the other hand, The Civil Engineering and Development Department (CEDD) has already planned to construct bypasses at Shap Pat Heung Interchange and Pok Oi Interchange to relieve the traffic pressure on these interchanges. The Shap Pat Heung Interchange Bypass will connect directly to Shap Pat Heung Road and Yuen Long Highway northbound. The Pok Oi Interchange Bypass will connect directly to Castle Peak Road westbound and Yuen Long Highway southbound. CEDD plans to commence the works for the Shap Pat Heung Interchange Bypass for completion within four years upon approval of funding by the Finance Committee. The works for the Pok Oi Interchange Bypass are expected to commence this year for completion in 2022. In the long run, apart from Route 11 and the associated major roads, the Government also plans to improve Tong Yan San Tsuen Interchange and Tin Shui Wai West Interchange under the Yuen Long South Development project, such that the entire road network in the relevant areas could be enhanced comprehensively. Based on the actual traffic conditions, the Transport Department will continue to study further improvement measures with the relevant departments.