

**For discussion
on 6 December 2022**

Legislative Council Panel on Transport

Tsing Yi – Lantau Link – Investigation and Detailed Design

PURPOSE

This paper regards the upgrading of part of **891TH** “Tsing Yi – Lantau Link” (TYLL) to Category A for conducting investigation and detailed design study for the TYLL project at an estimated cost of \$730.0 million in money-of-the-day (MOD) prices. Members are invited to provide views on the funding proposal.

PROJECT SCOPE AND NATURE

2. Subject to the findings of the investigation and detailed design study, the main scope of **891TH** comprises two long-span bridges and two large-scale interchanges with details given below –

- (a) construction of a dual three-lane long-span bridge of about 2.3 kilometres (km) long crossing the Ma Wan Fairway. The eastern end of the bridge will connect to Tsing Sha Highway at Tsing Yi west, while the western end of the bridge will connect to the proposed long-span bridge crossing the Kap Shui Mun Fairway as mentioned in paragraph 2(b) below at south of Ma Wan;
- (b) construction of a dual three-lane long-span bridge of about 1 km long crossing the Kap Shui Mun Fairway. The eastern end of the bridge will connect to the proposed long-span bridge crossing the Ma Wan Fairway as mentioned in paragraph 2(a) above at south of Ma Wan, while the western end of the bridge will connect to North Lantau Highway, the proposed Route 11 and the associated road links to the proposed Kau Yi Chau Artificial Islands at North Lantau;
- (a) construction of the “Tsing Yi Connection”, connecting the two above-mentioned long-span bridges with Tsing Sha Highway and the local roads at Tsing Yi including Tsing Yi North Coastal Road and Tsing Yi Road West. The associated works will involve realignment of Tsing Sha Highway and Cheung Tsing Highway;
- (d) construction of the “North Lantau Interchange”, connecting the two above-mentioned long-span bridges with North Lantau Highway, the

proposed Route 11, and the associated road links of the proposed Kau Yi Chau Artificial Islands; and

- (e) construction of associated ancillary facilities, including administration and ancillary buildings, traffic control and surveillance system, etc., and implementation of associated civil, structural, electrical and mechanical, environmental mitigation and other relevant engineering works.

3. The part of **891TH** (i.e., **891TH-1**) proposed to be upgraded to Category A comprises –

- (a) review the findings of relevant studies¹ and examine the alignments and design options of the proposed long-span bridges and interchanges;
- (b) assess the impact on environment, traffic, marine, heritage, land and other related aspects of the proposed works;
- (c) carry out the preliminary and detailed designs of the proposed works, including long-span bridge structures, viaduct structures at interchanges, roads, associated ancillary facilities and equipment designs, wind tunnel tests for stability assessment of the long-span bridges and designs of other relevant works, with an aim to acquiring sufficient details for the purposes of cost estimates, tendering and construction;
- (d) invite and assess tenders for construction works contracts of the proposed works; and
- (e) associated site investigations and works supervision.

4. Upon obtaining funding approval from the Finance Committee (FC) of the Legislative Council (LegCo), we will commence the proposed investigation and detailed design study (the Study) as soon as possible for target completion within about 48 months, including around 12 months of site investigations, around 15 months of Environmental Impact Assessment (EIA), around 11 months of gazettal and statutory procedures related to Cap. 370 Roads (Works, Use and Compensation) Ordinance, around 25 months of detailed design of the long-span bridges, and other investigations, detailed designs and tendering work. The tasks of the Study will be conducted in parallel whenever practicable with a view to expediting the delivery of the project.

¹ Including the engineering study of Tsing Yi – Lantau Link, and the on-going engineering studies of the interfacing projects, which are Route 11, Kau Yi Chau Artificial Islands and Road P1.

JUSTIFICATION

5. To meet the traffic demands arising from the progressive developments in the Northwest New Territories (NWNT) (including the Hung Shui Kiu / Ha Tsuen New Development Area (NDA) and the Yuen Long South Development), the Government is taking forward a group of major roads from Lam Tei to Tsing Yi passing through So Kwun Wat, Tai Lam Chung and North Lantau, which comprises Route 11 (section between Yuen Long and North Lantau), TYLL and widening of Yuen Long Highway (section between Lam Tei and Tong Yan San Tsuen). The entire group of the proposed strategic roads, connecting the NWNT with the urban areas, can improve the traffic conditions of major roads connecting the NWNT with the urban areas (including Tuen Mun Road, Tai Lam Tunnel and Ting Kau Bridge) and Lantau Link. It can also, by improving road infrastructure, further strengthen the connectivity of major roads and the capacity of interchanges, enhance the scale and the connectivity of developments in the vicinity, and unleash the development potential of the NWNT and North Lantau effectively. After a detailed review of the implementation programmes of the above-mentioned proposed strategic roads, the Government's latest target is to commission the entire group of major roads connecting the NWNT and urban areas in phases on or before 2033. A layout plan showing the preliminary alignment of the entire group of the proposed major roads is at **Enclosure**.

6. The Highways Department commenced the investigation study for Route 11 and the investigation and detailed design work for the Widening of Yuen Long Highway (section between Lam Tei and Tong Yan San Tsuen) in September 2021 and October 2022 respectively. As for TYLL, the Government commissioned an engineering study in March 2021, which studied a number of bridge and tunnel alignment options and comprehensively assessed these alignment options under the criteria, including the traffic benefits, engineering technical feasibility, land acquisition, environmental impact and project implementation programme, etc., to figure out the appropriate alignment scheme for TYLL and confirmed its benefits and preliminary engineering feasibility.

7. As the major roads connecting to both ends of TYLL (including the proposed Route 11, North Lantau Highway and Tsing Sha Highway) are located at a relatively high level above principal datum, we propose to implement TYLL in the form of bridges, with a total length of about 5.2 km, on the south of the existing Lantau Link. The preliminary alignment comprises two long-span bridges crossing the Kap Shui Mun Fairway and Ma Wan Fairway, "Tsing Yi Connection" and "North Lantau Interchange". This option, adopting a long-span bridge with shorter main span crossing the Ma Wan Fairway, will not encroach onto the Ma Wa Fairway and Ma Wan Anchorage, and will not affect the operation of fairways and port. Impacts to the existing oil depots and various marine facilities located at Tsing Yi west and southwest are also minimized. In addition, this alignment option eliminates the need of constructing an additional tunnel² in Tsing Yi for connecting

² Construction of an additional tunnel will increase the project cost and future operation cost. In addition, because of the duplicated function with Nam Wan Tunnel, it will lead to substantial decrease in utilisation of Nam Wan Tunnel and be considered as not fully utilising the existing road resources.

the Stonecutters Bridge. The proposed preliminary alignment is the most cost-effective option in view of transport planning, construction scale, project cost and operation requirements.

8. Based on the preliminary alignment and the results of the preliminary assessments of the engineering study as mentioned in paragraph 6 above, the Study will confirm the alignment, overall layout, design proposals and land requirements of TYLL. The Study comprises the relevant impact assessments, including EIA and matters relating to the preservation of cultural heritage, with a view to identifying the impacts and the required mitigation measures of the works. We will also carry out site investigation works to gather geotechnical and geological information for the design of the proposed works. We will subsequently conduct wind tunnel tests to verify the wind-resistant stability of long-span bridge structure, carry out detailed design, estimate the project costs, establish the procurement strategy for construction works and conduct tendering exercise for works contract.

Benefits

9. TYLL can relieve the forecast traffic impact on Lantau Link, creating capacity to cope with the long term development of the NWNT, Lantau Island and Hong Kong International Airport (HKIA). TYLL, being part of the group of strategic roads, together with the implementation of Route 11 and other relevant major roads, can improve the traffic conditions of major roads plying the NWNT and the urban areas, increase the route choices for the traffic commuting Lantau Island and the urban areas, and strengthen the resilience of the entire road network.

A. Improve Traffic Conditions of the Lantau Link

10. The Lantau Link is currently the most direct connection between Lantau Island and the urban areas. According to the preliminary traffic impact assessment, the traffic capacity of the Lantau Link will not be able to cope with the additional traffic commuting between the NWNT and the urban areas via Route 11 after the completion of Route 11. The Lantau Link will be suffered from traffic congestion during peak hours in due course³, regardless of the presence of the proposed road links connecting Kau Yi Chau Artificial Islands. Hence, we need to implement TYLL to relieve the forecast traffic impact on Lantau Link.

B. Improve Traffic Conditions of Major Roads between NWNT and Urban Areas and Increase Route Choice for Traffic commuting NWNT and Urban Areas in conjunction with Route 11

³ 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. According to the preliminary traffic impact assessment, the morning peak v/c ratio for the Lantau Link will be over 1.1 after the commissioning of Route 11, regardless of the presence of the proposed road links connecting Kau Yi Chau Artificial Islands. The implementation of TYLL can effectively reduce the morning peak v/c ratio of the Lantau Link to about 0.8.

11. TYLL in conjunction with Route 11 will form an express route between the NWNT and urban areas via Lantau Island and Tsing Yi. This express route will also serve as a reliable and convenient alternative route, in addition to Tai Lam Tunnel, Ting Kau Bridge and Tuen Mun Road, to improve the urban-bound traffic condition.

C. Increase Route Choice for Traffic commuting Lantau Island and Urban Areas and Strengthen Resilience of Road Network Connecting Lantau Island and Urban Areas

12. TYLL, serving as an alternative route to the existing Lantau Link for the vehicles commuting between Lantau Island and the urban areas, will strengthen the resilience of the road network connecting to the HKIA and Hong Kong – Zhuhai – Macau Bridge to traffic incidents. In the event of emergencies on Tsing Ma Bridge or Kap Shui Mun Bridge, the Lantau – urban bound traffic can pass through Stonecutters Bridge, Nam Wan Tunnel and TYLL. In addition, in case there are emergencies on Tsing Ma Bridge or Ting Kau Bridge, the traffic from Cheung Tsing Tunnel heading for Lantau Island or the NWNT can be diverted to TYLL by an emergency/ contingency crossing to be provided between TYLL and Cheung Tsing Highway northbound.

13. Taking into consideration the above traffic impact assessment and the anticipated traffic congestion on Lantau Link and having reviewed the implementation programmes of Route 11 and TYLL, the Government's latest target is to commission the entire group of the major roads (including TYLL) connecting the NWNT and urban areas in phases on or before 2033.

FINANCIAL IMPLICATIONS

14. We estimate the cost of the Study to be \$730.0 million in MOD prices, which includes the expenditure on the associated site investigation works. In view of the scale of TYLL, the complexity and multi-disciplinary nature of the Study (including design of long-span bridges, grade-separated interchanges and expressway, realignment of Tsing Sha Highway and Cheung Tsing Highway with busy traffic, geotechnical engineering design and EIA, etc.), we plan to engage consultants to undertake the Study and supervise the associated site investigation works.

PUBLIC CONSULTATION

15. In the LegCo FC meeting held on 13 April 2018 regarding the funding application for the feasibility study for Route 11, some LegCo members expressed their grave concern about the traffic impacts to the Lantau Link upon commissioning of Route 11. In the public consultation and funding application process for the investigation study for Route 11, members of the LegCo Panel on Transport and Public Works Sub-committee (PWSC) also raised the same concern

and requested for early implementation of TYLL during the Panel on Transport meeting and PWSC meeting held on 19 March 2021 and 20 May 2021 respectively. We also consulted Kwai Tsing District Council, Traffic and Transport Committee of Islands District Council and Tsuen Wan District Council on 8 November, 21 November and 29 November 2022 respectively about the TYLL project and they expressed their support to the project.

ENVIRONMENTAL IMPLICATIONS

16. The proposed TYLL is a designated project under Schedule 2 of the EIA Ordinance (EIAO) (Chapter 499), and the Highways Department has to apply for an environmental permit for the construction and operation of TYLL. 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 estimates the cost of implementing suitable pollution control measures to mitigate short-term environmental impacts arising from the site investigation works under the Study.

17. The Study and the associated 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

18. The Study and the associated site investigation works will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded heritage sites / historic buildings or structures, sites of archaeological interest, all newly proposed graded heritage sites/ historic buildings or structures, 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 appropriate mitigation measures if necessary.

LAND ACQUISITION

19. 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 implementation of the proposed works of TYLL.

TREE IMPLICATIONS

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

BACKGROUND INFORMATION

21. The Highways Department ascertained the transport need of TYLL under the feasibility study on Route 11 and subsequently commissioned an engineering study of TYLL under block allocation **Head 706 Subhead 6100TX** in March 2021.

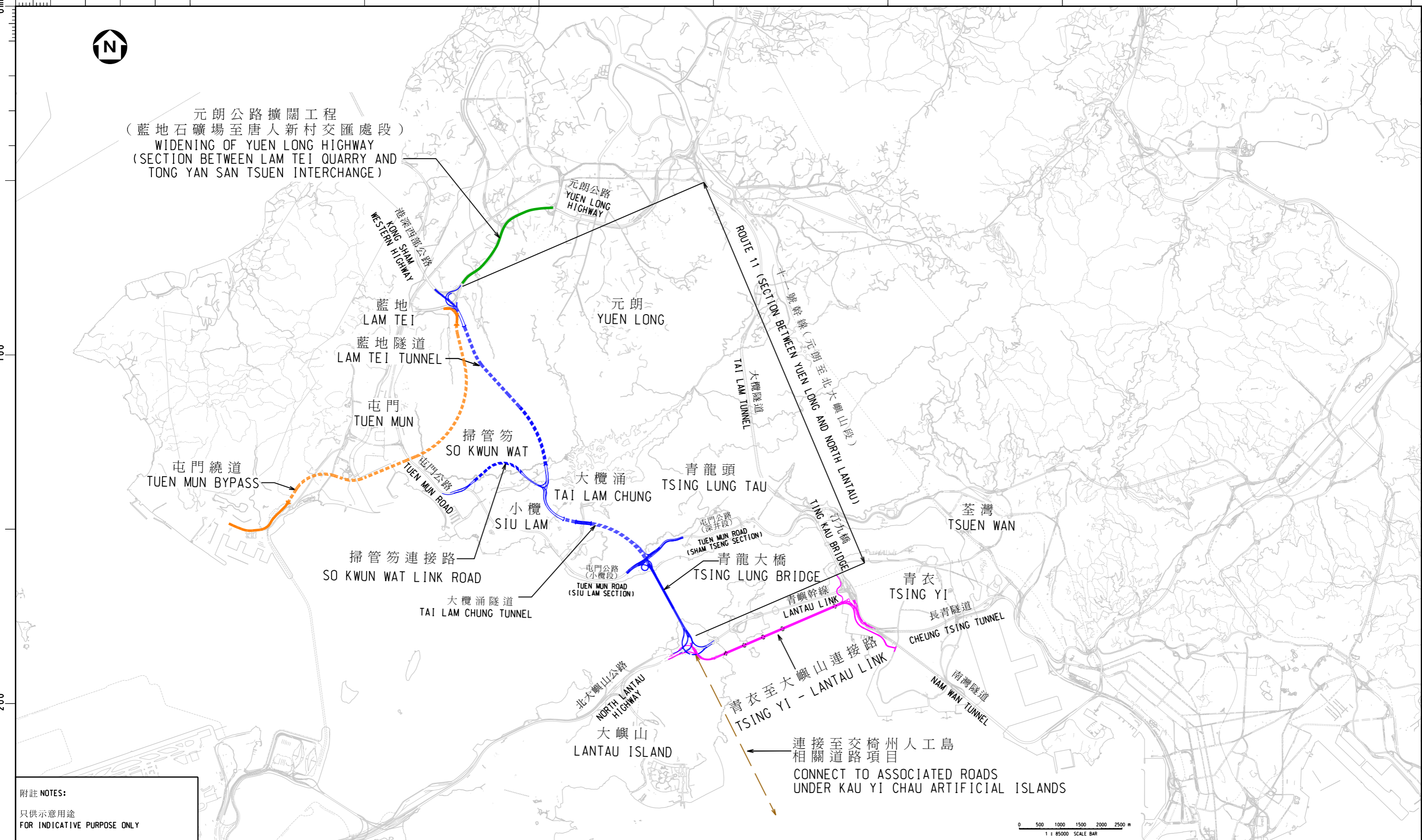
WAY FORWARD

22. After consulting the Panel on Transport, we plan to seek the support of the Public Works Subcommittee, and seek funding approval of the FC to upgrade part of **891TH** to Category A.

Transport and Logistics Bureau
December 2022



元朗公路擴闊工程
(藍地石礦場至唐人新村交匯處段)
WIDENING OF YUEN LONG HIGHWAY
(SECTION BETWEEN LAM TEI QUARRY AND
TONG YAN SAN TSUEN INTERCHANGE)



元朗公路
YUEN LONG HIGHWAY

港深西部公路
WESTERN SHAM HIGHWAY

藍地
LAM TEI

藍地隧道
LAM TEI TUNNEL

屯門
TUEN MUN

屯門繞道
TUEN MUN BYPASS

掃管笏
SO KWUN WAT

掃管笏連接路
SO KWUN WAT LINK ROAD

大欖涌
TAI LAM CHUNG

大欖涌隧道
TAI LAM CHUNG TUNNEL

小欖
SIU LAM

屯門公路
(小欖段)
TUEN MUN ROAD (SIU LAM SECTION)

青龍頭
TSING LUNG TAU

青龍頭大橋
TSING LUNG BRIDGE

屯門公路
(深井段)
TUEN MUN ROAD (SHAM TSENG SECTION)

北大嶼山公路
NORTH LANTAU HIGHWAY

大嶼山
LANTAU ISLAND

十一號幹線 (元朗至北大嶼山段)
ROUTE 11 (SECTION BETWEEN YUEN LONG AND NORTH LANTAU)

大欖涌隧道
TAI LAM TUNNEL

汀九橋
TING KAU BRIDGE

青嶼幹線
LANTAU LINK

青衣至大嶼山連接路
TSING YI - LANTAU LINK

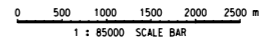
青衣
TSING YI

長青隧道
CHEUNG TSING TUNNEL

南灣隧道
NAM WAN TUNNEL

荃灣
TSUEN WAN

連接至交椅州人工島
相關道路項目
CONNECT TO ASSOCIATED ROADS
UNDER KAU YI CHAU ARTIFICIAL ISLANDS



附註 NOTES:
只供示意用途
FOR INDICATIVE PURPOSE ONLY

圖則名稱 drawing title
十一號幹線 (元朗至北大嶼山段)、青衣至大嶼山連接路、屯門繞道以及元朗公路擴闊工程 (藍地石礦場至唐人新村交匯處段) 的初步走線平面圖
LAYOUT PLAN FOR PRELIMINARY ALIGNMENT OF ROUTE 11 (SECTION BETWEEN YUEN LONG AND NORTH LANTAU), TSING YI - LANTAU LINK, TUEN MUN BYPASS AND WIDENING OF YUEN LONG HIGHWAY (SECTION BETWEEN LAM TEI QUARRY AND TONG YAN SAN TSUEN INTERCHANGE)

圖則編號 drawing no. HMW6870TH-SK0088	比例 scale 1:85000
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