

Highways Department
Tuen Mun Western Bypass

Project Profile

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DRAWING

HZMN05004-SP0012 Tuen Mun Western Bypass – Tentative Study Envelope

1. BASIC INFORMATION

1.1 Project Title

Tuen Mun Western Bypass

1.2 Purpose and Nature of the Project

According to the findings of the Northwest New Territories (NWNT) Traffic and Infrastructure Review conducted by the Transport Department, Tuen Mun Road, Ting Kau Bridge, Lantau Link and North Lantau Highway will be operating beyond capacity after 2016 due to increase in cross boundary traffic, developments in the NWNT, and possible developments in North Lantau, including the Airport developments, the Lantau Logistics Park and the Hong Kong – Zhuhai – Macao Bridge (HZMB). It is therefore necessary to provide new connection between NWNT with North Lantau to cope with the anticipated traffic demand.

The proposed Tuen Mun – Chek Lap Kok (TMCLKL) and Tuen Mun Western Bypass (TMWB) is one of the possible highway options identified under the NWNT Traffic and Infrastructure Review to meet the anticipated traffic demand of the NWNT and Lantau after 2016. The results of the studies concluded that it will provide the most direct route between the NWNT and Lantau, joining the Kong Sham Western Highway (formerly known as Deep Bay Link), the port back-up areas in the NWNT, the Tuen Mun River Trade Terminal, the proposed Ecopark, the Airport, the proposed Lantau Logistics Park, HZMB, North Lantau developments and possibly a new container terminal in Lantau. Upon completion, the new route will significantly reduce the journey time between the NWNT and Lantau. It will also release some capacity of the existing roads for urban bound traffic, offer strong support to the logistics industry in Lantau and reinforce the Airport as an international and regional aviation hub through providing an alternative land access for the Airport. Compared with the other highway options, it will provide better planning flexibility for possible future expansion of the road network from the NWNT to the urban areas in the “very long-term” (stands for year 2023 and beyond).

The TMWB, forming part of the proposed route between NWNT and North Lantau, is a dual two-lane highway of approximately 8.5 km in length connecting the Kong Sham Western Highway in the north and the proposed TMCLKL in the south.

1.3 Name of Project Proponent

Highways Department, HKSAR Government

1.4 Location and Scale of the Project

The location of the project is shown on the attached drawing no. HZMN05004-SP0012. The tentative study envelope for the possible alignments covers Tuen Mun Area from north to south, all within the HKSAR boundary.

The scope of the TMWB is to provide a proposed highway and the associated interchanges connecting the Kong Sham Western Highway and the proposed TMCLKL, which is divided into two sections:

TMWB – Southern Section, which comprises the followings:

- (i) a toll plaza near Lung Mun Road and about 2.7km land tunnel continuing from TMCLKL running through Castle Peak and emerging at the south of the Tuen Mun North Freshwater Service Reservoir at Por Lo Shan;

- (ii) about 1.1km viaduct emerging from the northern portal of (i) running between the Freshwater Service Reservoir and Saltwater Service Reservoir, which then turns northward to the western hillside of Leung King Estate, to connect to TMWB - Northern Section; and
- (iii) about 1km link roads bifurcating from (ii) near the Service Reservoirs, to connect to Tsing Tin Road to allow traffic movement to/from Tuen Mun East.

TMWB – Northern Section, which comprises the followings:

- (i) about 2.7km long land tunnel continuing from TMWB - Southern Section at the west of Leung King Estate through Castle Peak encroaching upon the Tsing Shan Firing Range and emerging at the north of Villa Pinada;
- (ii) about 0.4km short viaduct continuing from the northern portal of (i) above, spanning across the valley at the north of Villa Pinada and ending at the western side of Chung Shan;
- (iii) about 0.4km short tunnel through Chung Shan and emerging at the east of Chung Shan; and
- (iv) about 1.7km viaduct and associated slips roads bifurcating to connect with Kong Sham Western Highway at both the northern side towards Shenzhen Bay Bridge (formerly known as Shenzhen Western Corridor) and the southern side towards Yuen Long Highway.

The above proposed structural forms are all tentative at this stage and subject to review. Other structural forms will be investigated if necessary.

There will be refinement of the highway alignment within the tentative study envelope. Selection of the alignment will be dependent on a variety of factors such as environmental impacts, construction programme and cost, planning and engineering considerations, traffic implications, land resumption requirements, etc.

1.5 Number and Types of Designated Projects to be covered by the Project Profile

The proposed TMWB involves the construction and operation of highways and the associated link roads, which is classified as Designated Projects under Schedule 2, Categories A.1, A.7, A.8 and Q.1 of the Environmental Impact Assessment Ordinance.

1.6 Contact Person

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2. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

2.1 Project Planning and Implementation

The TMWB will be implemented under a PWP item. Consultants will be appointed to undertake the investigation study of the project.

2.2 Project Programme

According to the current programme, the construction of TMWB is expected to commence in 2011 for completion by 2016. This is subject to confirmation pending findings of other relevant technical studies.

2.3 Interfacing with other Projects

Potential projects that would interface with TMWB have been identified and are listed below. This list should be re-visited during the EIA stage to ensure all the latest projects available from the respective stakeholders are incorporated.

Phase	Other Projects in the Vicinity
Construction	Tuen Mun Area 54 Development
	Proposed construction and demolition materials handling facilities in Tuen Mun Area 38
	Existing temporary fill bank, construction waste and public fill sorting facilities in Tuen Mun Area 38
	Proposed Tuen Mun – Chek Lap Kok Link
Operation	Kong Sham Western Highway
	Proposed EcoPark at Tuen Mun Area 38
	Castle Peak and Black Point Power Stations
	Proposed construction and demolition materials handling facilities in Tuen Mun Area 38
	Proposed Tuen Mun – Chek Lap Kok Link

3. POSSIBLE IMPACT ON THE ENVIRONMENT

3.1 Outline of Process Involved

Based on the preliminary study, the TMWB would conceptually be made up of the following elements:

- Elevated bridges
- Land tunnel
- Toll plaza
- Ventilation buildings

The elevated bridges are likely to be of pre-stressed concrete construction with piled foundation. The tunnel of the TMWB would be constructed using drill and blast excavation method. The layouts and construction methods of the bridges and tunnel will be examined under the investigation assignment of this project; and considerations would be taken in the selection of the project alignment and the design to avoid and/or minimize the environmental impacts to the sensitive receivers.

3.2 Existing Available Data

In 2005, Highways Department engaged consultant to undertake a Feasibility Study for the possible alignment of the TMWB. A large number of areas along the tentative alignment were examined and assessed based on environment criteria such as air quality, noise, water quality, ecology, landscape and visual, cultural heritage and waste management.

3.3 Construction and Operational Environmental Impact

It is anticipated that surrounding sensitive receivers could be affected by air quality, noise, water quality, ecological, landscape and visual, cultural heritage, hazardous to life and waste management impacts during the construction and operational stages.

3.3.1 Air Quality

During construction phase, construction dust will be potentially generated from excavation works, backfilling, wind erosion of exposed area, temporary storage of spoil on site, transportation and handling of spoil and slope cutting.

During operational phase, air pollution sources will be associated with emissions from the traffic using the highway, tunnel portal and ventilation buildings. Cumulative air quality impact would need to be taken into account of neighbouring roads, such as Lung Mun Road, Tsing Wun Road, Ming Kum Road, etc. Cross boundary emissions and emissions from Castle Peak and Black Point Power Plants may need to be considered as well.

3.3.2 Noise

During construction phase, potential noise impacts on noise sensitive receivers will be associated with construction activities and powered mechanical equipment. The key construction activities which would create noise impacts will be piling for foundation, excavation and concreting etc. The impact for any night time work would need to be considered as well.

During operational phase, noise sources will be associated with the traffic using the highway and the ventilation noise. The cumulative noise impact of neighbouring roads such as Lung Mun Road, Tsing Wun Road and Ming Kum Road, and other fixed noise sources would need to be considered.

3.3.3 Water Quality

During construction phase, potential major sources of water quality impacts for TMWB may arise from construction runoff and sewage generated by workforce. In addition, the construction of viaduct foundation may affect the nearby local streams in Tuen Mun.

During operational phase, local flow pattern may be affected in the vicinity of pier foundation. Other potential water pollution sources would include the surface runoff from the viaduct and accidental chemical spillage. Cumulative water quality impact due to other concurrent projects would need to be considered.

3.3.4 Ecology

During construction phase, major impacts on ecology for TMWB would include terrestrial habitat loss at temporary work areas, tunnel portal and viaduct section.

During operational phase, potential ecological impacts will include traffic noise and artificial lighting at areas near viaduct and portal areas, which may affect the behaviour of terrestrial fauna.

3.3.5 Landscape and Visual

The proposed viaducts and tunnel portals might affect the hillside landscape, village housing landscape and urban fringe landscape within Tuen Mun West.

3.3.6 Cultural Heritages

Special considerations would need to be given for the viaduct section near to potential archaeological sites (e.g. Siu Hang Tsuen and Tsing Chuen Wai), which would be close to the

alignment. In order to avoid affecting unknown archaeological sites, archaeological impact assessment will be conducted during the EIA stage to provide comprehensive archaeological information for evaluation.

3.3.7 Waste Management

Activities during construction phase may result in the generation of a variety of waste generally comprising excavated materials, chemical waste, construction waste and general refuse. Sediment handling will depend on the pollution levels.

3.3.8 Hazardous to Life

For the TMWB, there is certain hazard related to blasting for tunnel construction.

4. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

4.1 Existing and Planned Sensitive Receivers

The existing and planned sensitive receivers are discussed below. Any planned sensitive receivers identified during the study will be considered. Detailed investigation and surveys will be carried out under the project to assess the impact.

4.1.1 Air Quality

Potential air sensitive receivers are located at:

- Offices or workshops at Tuen Mun River Trade Terminal and Tuen Mun Area 40;
- Residential buildings along Lung Mun Road and Ming Kum Road including Butterfly Estate, Sun Tuen Mun Centre, Lung Mun Oasis, Shan King Estate, Tai Hing Estate, Tin King Estate, Leung King Estate, Po Tin Estate and Proposed Housing Estate in Tuen Mun Area 29;
- Butterfly Beach, Tuen Mun Golf Centre, Adventure Park, Yeung King Playground, Proposed LCSD swimming pool in Tuen Mun Area 29;
- Tuen Mun Public Riding School, Hong Kong Institute of Vocational Education (Tuen Mun) and Schools in Butterfly Estate, Shan King Estate, Tai Hing Estate, Tin King Estate and Leung King Estate;
- Industrial buildings at the east of Ming Kum Road and Tsing Wun Road;
- Tsing Shan Tsuen at San Shek Wan South and North, Siu Hang Tsuen, Tuen Tsz Wai, San Hing Tsuen, and Tsing Chuen Wai; and
- Temples and monasteries in Castle Peak, such as Tsing Shan Monastery.

4.1.2 Noise

Potential noise sensitive receivers are located at:

- Residential buildings along Lung Mun Road and Ming Kum Road including Butterfly Estate, Sun Tuen Mun Centre, Lung Mun Oasis, Shan King Estate, Tai Hing Estate, Tin King Estate, Leung King Estate, Po Tin Estate and Proposed Housing Estate in Tuen Mun Area 29;
- Tuen Mun Public Riding School, Hong Kong Institute of Vocational Education (Tuen Mun) and Schools in Butterfly Estate, Shan King Estate, Tai Hing Estate, Tin King Estate and Leung King Estate;

- Tsing Shan Tsuen at San Shek Wan South and North, Siu Hang Tsuen, Tuen Tsz Wai, San Hing Tsuen, and Tsing Chuen Wai; and
- Temples and monasteries in Castle Peak, such as Tsing Shan Monastery.

4.1.3 Water Quality

Potential water sensitive receivers would be:

- Gazetted and non-gazetted beaches in Tuen Mun; and
- Existing and planned seawater water intake in Tuen Mun.

4.1.4 Ecology

Potential ecological sensitive receivers would be:

- Castle Peak Site of Special Scientific Interest (SSSI) and Tsing Shan Tsuen SSSI,
- Siu Lang Shui Butterfly Overwintering Site;
- Tuen Mun Area 54 Woodland; and
- Tuen Mun Egrettry.

4.1.5 Landscape and Visual

Potential landscape and visual sensitive receivers would be:

Landscape Sensitive Receivers

- Industrial urban landscape near Tuen Mun River Trade Terminal;
- Butterfly Beach and Butterfly Beach Park;
- Upland and hillside landscape at Castle Peak;
- Residential urban fringe landscape to the west of Yeung Siu Hang and Shan King Estate;
- Castle Peak SSSI;
- Woodland in Tuen Mun Area 54;
- Open Space zone at Butterfly Beach and Butterfly Beach Park;
- Green Belt zone in Tuen Mun; and
- Conservation Area zone in Lam Tei and Yick Yuen.

Visual Sensitive Receivers

- Workers at Tuen Mun River Trade Terminal;
- Visitors at Butterfly Beach and Butterfly Beach Park;
- Residents at Butterfly Estate;
- Passengers at Tuen Mun Ferry Pier;
- Residents at Shan King Estate, Leung King Estate and other estates;
- Village residents in Lam Tei; and
- Residents at Tuen Mun waterfront.

4.1.6 Cultural Heritage

Cultural and heritage resources in the vicinity of the study area would be:

- Shek Kok Tsui archaeological site in Tuen Mun;
- Tuen Tsz Wai archaeological site in Tuen Mun;
- San Hing Tsuen archaeological site in Tuen Mun;
- Siu Hang Tsuen archaeological site in Tuen Mun;
- Tsing Chuen Wai archaeological site in Tuen Mun;
- Tsing Shan Monastery in Tuen Mun;
- Hung Lau in Tuen Mun;
- Hau Kok Tin Hau Temple in Tuen Mun;
- Ching Chung Koon in Tuen Mun;
- Sam Shing Kung in Tuen Tsz Wai in Tuen Mun; and
- Tao Ancestral Hall in Tuen Tsz Wai in Tuen Mun.

4.2 Major Elements of Surrounding Environment and Land Uses

The study area of possible alignment of southern section of TMWB covers the centre of Tuen Mun, which is characterized by the high-rise buildings. There are also a number of schools in this area. It also covers part of Castle Peak, which is an undeveloped area characterized by steep natural terrain and a number of temples. The northern section of the TMWB is a remote and undeveloped area characterized by a number of villages. There are a number of sites of environmental/ecological/historical importance located within the study areas, including SSSIs and archaeological sites.

5. ENVIRONMENTAL MITIGATION MEASURES

Based upon the potential impacts as a result of the construction and operation of the project, it is anticipated that mitigation measures will be required. Measures to minimise environmental effects are detailed below.

5.1 Measures to Minimize Environmental Impacts

5.1.1 Air Quality

Appropriate dust mitigation measures as stipulated in the Air Pollution Control (Construction Dust) Regulations will be implemented to control fugitive dust emission. The key measures are:

1. Regular watering on all exposed and unpaved surface, particularly during dry weather;
2. Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers;
3. Covering all excavated or stockpile of dusty material by impervious sheeting or spraying with water to maintain the entire surface wet;
4. Provision of wheel washing facilities at the exit points of the site;
5. Covering of any dusty materials on vehicles leaving the site; and
6. Avoid slope cutting and minimize extent of cut-&-cover tunnelling section.

Subject to investigation, the following measures will be considered during operational period to minimize the air quality impacts on nearby air sensitive receivers

1. Provision of buffer area between the sources and the receivers; and
2. Location of ventilation building and tunnel portal far away from the air sensitive receivers.

5.1.2 Noise

Subject to investigation, the following measures will be considered during construction period to minimize construction noise impacts on nearby noise sensitive receivers.

1. Implementing good site practices such as orientating the noisy plant away from the nearby noise sensitive receivers, proper fitting of silencer on the construction equipment and use of quiet plant;
2. Temporary noise barriers are likely to be required along the construction site boundary such that construction equipment and noise are screened;
3. Silencers on construction equipment should be properly fitted and maintained during the construction works; and
4. Mobile plant should be sited as far as away from noise sensitive receivers as possible and practicable.

Subject to investigation, the following measures will be considered during operational period to minimize the traffic noise impacts on nearby noise sensitive receivers.

1. Short noise barriers and low noise surface material may be required along some sections of the new highway for reducing traffic noise during the operational noise.

5.1.3 Water Quality

The following mitigation measures will be adopted to control the water quality impact:

1. Good site practice in accordance with the ProPECC PN 1/94 “Construction Site Drainage” and “Recommended Pollution Control Clauses for Construction Contracts” issued by EPD, and the procedures in ETWB TCW No. 5/2005 “Protection of Natural Stream / Rivers from adverse impact arising from construction works”; and
2. All runoffs arising from the construction site should be properly collected and treated to ensure the effluent comply with Water Pollution Control Ordinance. Silt trap and oil interceptor will be provided to remove the oil, lubricants, grease, silt, grit and debris from the wastewater before being pumped to the public stormwater drainage system. The silt traps and oil interceptors will be cleaned and maintained regularly.

The following measures will be adopted during operational period to minimize the water quality impacts on nearby water sensitive receivers.

1. Stormwater from road surface should be collected into drainage system via silt traps and oil interceptor to remove silt / grit and oil before discharging; and
2. Develop contingency plan for accidental chemical spillage.

5.1.4 Ecology

Avoidance of any identified sensitive sites will be the preferred mitigation measures. Subject to investigation, the following mitigation measures during construction phase will be considered to minimize the impact.

1. The water quality mitigation measures proposed in S.5.1.3 will be adopted; and

2. Disruption to terrestrial sensitive areas will be avoided as far as possible.

The following mitigation measures during operational phase will be considered to minimize the impact.

1. The water quality mitigation measures proposed in S.5.1.3 will be adopted; and
2. Should there be encroachment of woodland due to TMWB, compensation of woodland area will be required.

5.1.5 Cultural Heritage

Archaeological field investigation will be conducted by qualified archaeologists to identify any unknown archaeological sites and built heritage along the proposed alignments. For land archaeological survey, investigation will include field walking, augering and test trenching. Mitigation measures for cultural heritage impacts in the first instance will include avoidance of the area of importance and minimisation of direct impacts.

5.1.6 Landscape and Visual

Mitigation measures to minimize environmental impact during both the construction and operational phases should be comprehensively reviewed for both landscape and visual aspects. Possible mitigation measures are as follows:

During construction phase

- Temporary greening treatment on bare soil surface before construction works of structures take place;
- Hoarding to be erected at the interface between the construction site and the existing area;
- Early formation of the planting area and advance planting of vegetations on the concerned landscape sensitive receivers; and
- Sensible locations of viaduct alignment, columns and portals to minimise impact to existing trees.

During operation phase

- Aesthetic design of the portal structures;
- Aesthetic design of any noise barrier on viaduct section near residential areas;
- Aesthetic design of a well-accepted viaduct;
- Tree planting and earth mounds near portals to reduce their apparent size scale and to visually screen and soften the structures;
- Early formation of the planting area and advance planting of vegetations on the concerned landscape sensitive receivers in operation phase;
- Concealing the portal structures on their roof and sides by earth mounds and vegetation planting on top of the mounds;
- Sensible locations of viaduct alignment, columns and portals to minimise impact to existing trees. Felled trees have to be compensated;
- Permanent planters with irrigation system on flyovers in built-up areas (with reference to ETWB TCW No. 10/2005);
- Earth mounds and tree planting near columns to reduce the apparent height and massiveness of supporting columns; and
- Reprovision of any loss open spaces and recreational facilities on-site or off-site.

5.1.7 Waste Management

The waste management hierarchy is to minimise waste generation. If waste generation cannot be avoided, a material/waste management plan will be established prior to commencement of excavation and construction work to outline the methods that can be incorporated into the project for waste minimization, including reuse, recycle, handling, storage, transportation and disposal of expected waste materials. For handling of dredged sediment, the ETWB TCW No. 34 /2002 will be followed.

As TMWB is a highway for use by road traffic, waste impact during the operational stage is considered as extremely small.

5.2 Severity, Distribution and Duration of Environmental Effects

For TMWB, noise, ecology and landscape and visual impact will be severe during construction

The level of archaeological impact will need to be ascertained subject to detailed land and marine cultural heritage assessments

Subject to investigation on noise impacts, permanent noise barrier / low noise surfacing may be required to keep the noise impact to acceptable level.

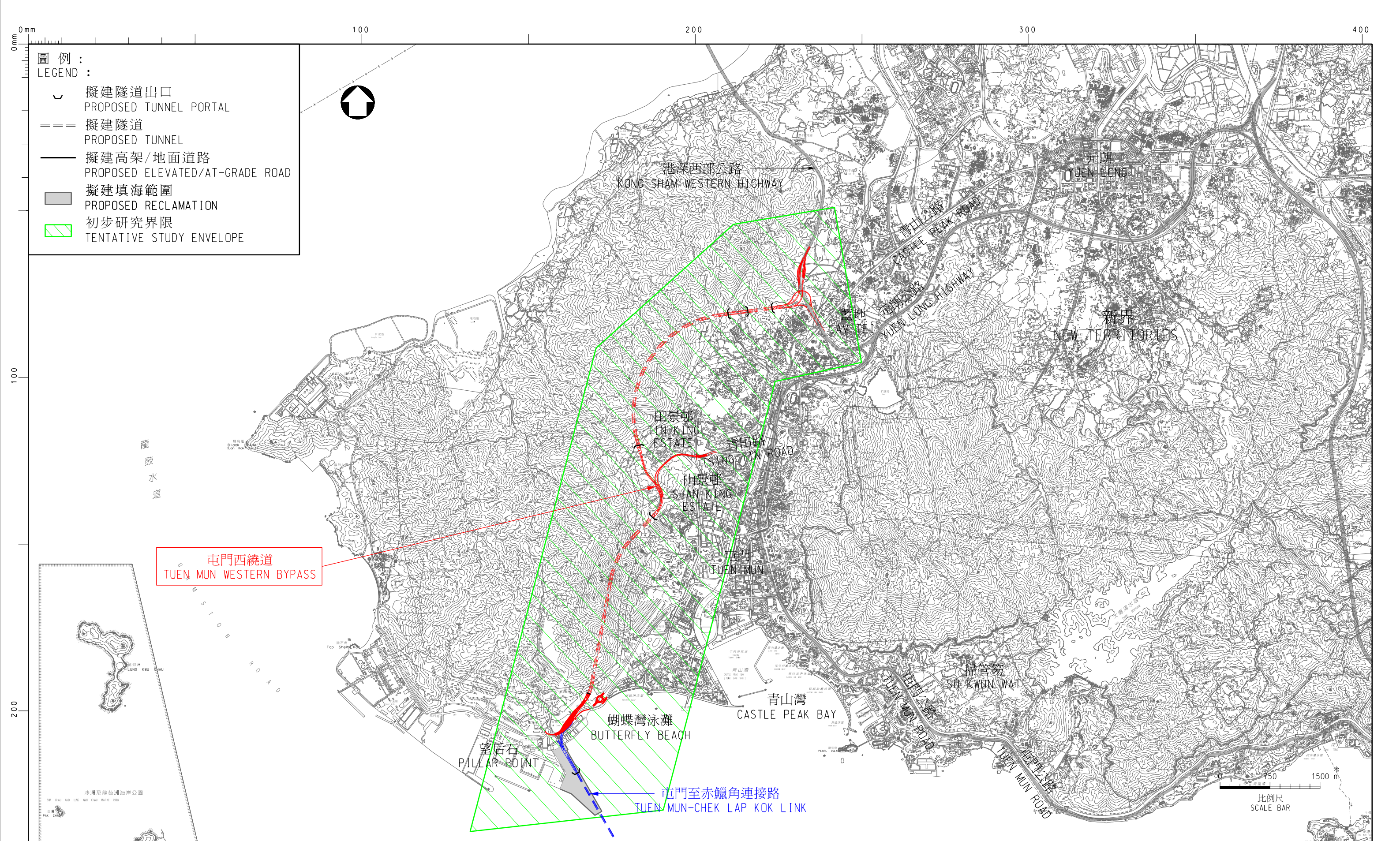
5.3 Further Implication






Public consultation will be arranged once sufficient information is available.

6. USE OF PREVIOUSLY APPROVED EIA REPORTS

No previous approved EIA report exists for the proposed project. However, reference may be made to the following previously approved EIA reports within the study area:

Register No	Title
EIA-015/BC	EIA of the Proposed 6000MW Thermal Power Station at Black Point: Initial Assessment and Key Issue Assessment
AEIAR-015/1999/8/30	Planning and Development Study of Potential Housing Site in Area 54, Tuen Mun
AEIAR-064/2002	Deep Bay Link
AEIAR-066/2002	Construction of Lung Kwu Chau Jetty
AEIAR-067/2002	Shenzhen Western Corridor




- 圖例：
LEGEND：
-  擬建隧道出口
PROPOSED TUNNEL PORTAL
 -  擬建隧道
PROPOSED TUNNEL
 -  擬建高架/地面道路
PROPOSED ELEVATED/AT-GRADE ROAD
 -  擬建填海範圍
PROPOSED RECLAMATION
 -  初步研究界限
TENTATIVE STUDY ENVELOPE

屯門西繞道
TUEN MUN WESTERN BYPASS

屯門至赤鱗角連接路
TUEN MUN-CHEK LAP KOK LINK

圖則名稱 drawing title

屯門西繞道 - 初步研究界限
TUEN MUN WESTERN BYPASS - TENTATIVE STUDY ENVELOPE

設計 designed K.K.LEE 15/11/07	SIGNED	繪圖 drawn H.S.CHAN 15/11/07	SIGNED	圖則編號 drawing no. HZMN05004-SP0012	比例 scale 1:50000
覆核 checked C.K.WONG 15/11/07	SIGNED	批准 approved C.H.CHEUNG 15/11/07	SIGNED	© 版權所有 COPYRIGHT RESERVED	
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