For discussion
on 23 May 2006

LEGISLATIVE COUNCIL
PANEL ON PLANNING, LANDS AND WORKS

Wan Chai Development Phase II Review
Harbour-front Enhancement Review –
Wan Chai, Causeway Bay and Adjoining Areas
Outcome of Public Engagement at the Envisioning Stage

Purpose

This paper briefs Panel Members on the progress and outcome of the public engagement at the Envisioning Stage of the Harbour-front Enhancement Review – Wan Chai, Causeway Bay and Adjoining Areas (HER project).

Background

2. In response to the Town Planning Board (TPB)'s request and in the light of the judgment of the Court of Final Appeal (CFA) on 9 January 2004 in relation to the interpretation of the Protection of the Harbour Ordinance (PHO), the Government decided to commence a planning and engineering review of the Wan Chai Development Phase II project (WDII Review) to ensure full compliance with the requirements of the PHO and the CFA judgment.

3. The Government has accepted the recommendation of the Harbour-front Enhancement Committee (HEC) to conduct a public engagement exercise titled HER under the steer of the HEC's Sub-committee on WDII Review (Sub-committee) and in parallel with the WDII Review. The objectives of the HER project are to achieve a socially, environmentally and economically sustainable harbour-front at Wan Chai, Causeway Bay and adjoining areas, and to satisfy the planning, transport and infrastructure needs. Results of the HER project will provide input to the WDII Review.

4. The HER project comprises the following three stages -

(a) The Envisioning Stage – The purpose is to engage the community at an early stage to solicit their visions on the types of harbour-front developments they aspire for at Wan Chai, Causeway Bay and the adjoining areas, while acknowledging the opportunities available and the constraints for development. Sustainability principles and indicators will be compiled at this stage for further evaluation of development proposals. The Envisioning Stage was completed in end 2005.

(b) The Realization Stage – Based on the findings of the Envisioning Stage, Concept Plan will be developed for evaluation using the Harbour Planning Principles developed by the HEC and the agreed sustainability principles and indicators developed at the Envisioning Stage with a view to arriving at a consensus on the preliminary development proposals.

(c) The Detailed Planning Stage – Based on the consensus arrived at in the Realization Stage, a Recommended Outline Development Plan (RODP) will be drawn up, and the relevant draft revised Outline Zoning Plan(s) (OZP(s)) will be prepared in accordance with the statutory requirements and procedures of the Town Planning Ordinance.

5. On 26 April 2005, we briefed Panel Members on the overview and the strategy for the public engagement process of the HER project. On 28 June 2005, Panel Members were also briefed on the progress of the public engagement process for the HER project and the major comments received during the public engagement activities conducted up to that stage.

Public Engagement Activities at the Envisioning Stage of HER

6. Five public forums, two community design charrettes and opinion surveys were convened during May to July 2005. These public engagement activities were well received by the public as providing a platform for thorough exchange of views, rational discussions and consensus building.

7. While there was some consensus on harbour-front enhancement, views on the need for the Central – Wan Chai Bypass (CWB) were diverse. To address that issue, the Sub-committee appointed a Transport Expert Panel (Expert Panel) comprising leading local and overseas experts in the transport and planning fields to review and make recommendations on the sustainable transport planning for the northern shore of Hong Kong Island including the need for the CWB. The Sub-committee also convened an Expert Panel Forum on Sustainable Transport Planning and Central – Wan Chai Bypass on 3 September 2005 to provide an opportunity for the Expert Panel members to discuss the issues with the public, taking into consideration the submissions by the Government and the public to the Expert Panel. The Forum was well attended by District Council members, representatives of various community organizations as well as members of the public.

8. The Expert Panel completed their report in late October 2005, a copy of which is at **Annex A** for Panel Members' information. The Expert Panel supports the construction of the CWB and the provision of two sets of planned slip roads to magnify the benefits of the CWB. The Expert Panel also recognizes the need for Road P2 and has recommended a package of short-term, medium-term and long-term measures to achieve a sustainable transport strategy. Details could be found in section 3.3 of the Expert Panel's report.

9. The Sub-committee endorsed the Expert Panel's report at its meeting held on 12 December 2005 and supported the construction of a CWB.

Outcome of the Envisioning Stage

10. To share with the public ideas and proposals received from the public during the Envisioning Stage, the Sub-committee convened a Consolidation Forum on 12 November 2005. The Consultants also consolidated the ideas and proposals received.

11. A copy of the report of the Envisioning Stage of HER, which was endorsed by the Sub-committee at its meeting held on 9 March 2006, is at **Annex B** for Panel Members' reference.

12. As regards the alignment and possible forms of construction of the CWB, in accordance with the Sub-committee's requirements, the

Consultants have prepared a comprehensive report to provide detailed information on the overall design of the Trunk Road, including the horizontal and vertical alignments, and the possible harbour-front enhancement ideas taking note of the public opinions received. A copy of the Consultants' full report submitted to the Sub-committee in CD-ROM format is at **Annex C**. A hardcopy of the report is available at the Secretariat for Panel Members' reference. A summary for the Consultants' report is at **Annex D**. Some key issues are described below.

Need for reclamation

13. All schemes for the CWB alignment through the WDII project area will require reclamation. In the west, the Trunk Road will extend the tunnel to be constructed within the Central Reclamation Phase III (CRIII) area eastward to pass above the existing tunnel structure of the MTR Tsuen Wan Line as passing underneath it is not feasible. At the crossing point, the CWB tunnel structure will be above sea level and hence requires reclamation. The slip roads at Wan Chai North will also require reclamation as they rise above seabed to their portals at ground level. In the east, the CWB needs to connect to the existing Island Eastern Corridor (IEC) flyover. If the CWB is to be built in the form of tunnel, the transition from tunnel to flyover will require reclamation for the ground level tunnel portal construction.

Trunk Road alignments and construction forms

14. The Consultants have concluded that the only feasible Trunk Road routing is the one along the foreshore of Wan Chai and Causeway Bay. Alternative alignments including "offshore" and "inland" routeings have also been examined but found not feasible as they are constrained by existing developments and essential public service infrastructures.

15. As for construction forms, the Consultants have considered the Tunnel Option and Flyover Option.

Tunnel and Flyover Options

16. The Consultants have developed three variations for the Tunnel Option as follows -

(a) Variation 1 – it will extend the tunnel to be constructed under the CRIII eastward to pass underneath the existing rock anchors of the Cross Harbour Tunnel (CHT) portal structure, continue the tunnel to the east of the Causeway Bay Typhoon Shelter (CBTS) and connect to the northern side of the existing IEC.

(b) Variation 2 – it will extend the tunnel to be constructed under CRIII eastward to pass underneath the CHT at a position to the south of that in Variation 1 to avoid the rock anchor zone, and continue the tunnel to the east of the CBTS. It will connect directly to the IEC by demolishing and reconstructing a section of the existing IEC and realigning the existing Victoria Park Road.

(c) Variation 3 – it is similar to Variation 2, except that the tunnel will pass underneath the rock anchors of the CHT portal as in Variation1.

17. Under the Flyover Option, the tunnel to be constructed under CRIII will be extended eastward, and will rise up onto an elevated road structure at the waterfront opposite to the Wan Chai Sports Ground, traverse the foreshore of the CBTS and connect directly into the existing IEC.

18. A comparison between the Tunnel Option, using Variation 1 described above, and the Flyover Option is given in **Table 4.2** of the Consultants' report at **Annex C** and reproduced in **Annex D**. A detailed comparison of the three tunnel variations is provided in **Table 4.1** therein and reproduced in **Annex D**.

19. The PHO requires the harbour to be protected and preserved as a special public asset and a natural heritage of Hong Kong people. Therefore, when examining options/variations for the Trunk Road, the one that may serve best to protect and preserve the harbour should be identified. For the Flyover Option, the land formation by physical reclamation together with the water areas of the harbour affected by flyover structures should be taken into account.

20. Although both the capital and annual recurrent costs would be higher for the Tunnel Option, the Consultants suggested that the Tunnel Option should be taken forward as it would better protect and preserve the harbour because the affected area of the harbour would be smaller and

it would cause less visual impact than the Flyover Option.

21. For the variations of the Tunnel Option, the Consultants highlighted the following concerns for Variations 2 and 3 -

(a) More reclamation due to filling in of the corners of the CBTS (south-east and south-west corners for Variation 2, south-east corner for Variation 3);

(b) Major road diversions and traffic impacts during construction due to the need to demolish and reconstruct a considerable length of the existing IEC along the North Point shoreline from about City Garden to Victoria Park Road and to realign Victoria Park Road (both Variations 2 and 3);

(c) Intrusion into and demolition of Victoria Park for the construction of the realigned Victoria Park Road (both Variations 2 and 3); and

(d) Need for the reconstruction of major existing highway structures, including the IEC, Gloucester Road Flyover and the newly constructed Causeway Bay Flyover (both Variations 2 and 3).

Harbour-front enhancement ideas

22. The Consultants recommended the following harbour-front enhancement ideas in view of the support from the public -

(a) Make use of land to be formed along Wan Chai shoreline for harbour-front enhancement.

(b) Develop a marine basin at the ex-Public Cargo Working Area (PCWA) for water recreation uses.

(c) Extend Victoria Park to the harbour-front.

(d) Retain existing CBTS or limiting reclamations at corners of CBTS.

(e) Provide boardwalk/floating bridge underneath the existing IEC.

Way Forward

23. The District Councils concerned, Legislative Council, other relevant institutions and organizations as well as the public will be consulted on the proposed alignments and construction forms of the Trunk Road with the objective of incorporating the chosen options into the Concept Plan to be prepared under the WDII Review. Meanwhile, the Sub-committee will continue with the consideration of the Consultants' findings related to the design of CWB and harbour-front enhancement.

24. Taking into account the views collected and after discussion with the Sub-committee, preparation of the draft Concept Plan will start with a view to having it ready by around June 2006.

25. Appropriate activities such as workshop and town hall meeting, will be arranged in around July 2006 for engaging the public on the Concept Plan so as to arrive at a consensus on the development proposals.

26. With due consideration of the public input, preparation of the relevant draft RODP and draft revised OZP(s) will commence. It is targeted to submit the draft RODP and OZP(s) to the TPB in late 2006 for consideration.

Advice Sought

27. Panel Members are invited to comment on the outcome of the Envisioning Stage of HER project.

Attachment

Annex A: Report of the Expert Panel on Sustainable Transport Planning and Central – Wan Chai Bypass

Annex B: Public Engagement Report of Envisioning Stage of HER

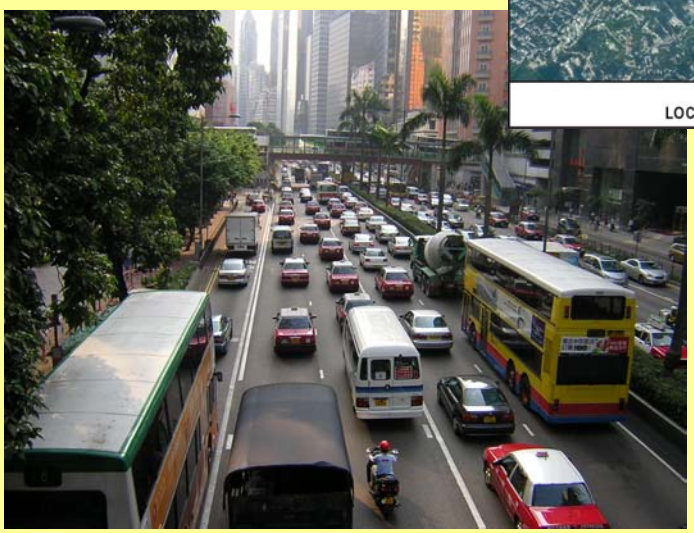
Annex C: Consultants' Report on "Trunk Road Alignments & Harbour-front Enhancement"

Annex D: Summary for the Consultants' Report on "Trunk Road Alignments & Harbour-front Enhancement"

Housing, Planning and Lands Bureau
Environment, Transport and Works Bureau
Civil Engineering and Development Department
Planning Department
Transport Department
May 2006

Annex A

Report of the Expert Panel on Sustainable Transport Planning and Central - Wan Chai Bypass



October 2005

Report of the Expert Panel on Sustainable Transport Planning and Central – Wan Chai Bypass

October 2005

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Foreword

Transport and land use decisions in Hong Kong have traditionally been made by the government, with input by specialists. In the past decade, nongovernmental organizations and concerned citizens have increasingly been involved in decisions affecting the outcome of road construction and urban development projects. While a consensus on enhancing the harbour-front emerged during public engagement of the Envisioning Stage of the Harbour-front Enhancement Review – Wan Chai, Causeway Bay and Adjoining Area project, diverse views on transport issues were also expressed by the public. This has prompted the Wan Chai Development Phase II Review Sub-committee to convene the Expert Panel Forum on Sustainable Transport Planning and Central-Wan Chai Bypass. The Expert Panel is invited to explore sustainable transport planning along the northern shore of Hong Kong Island and to deliberate on whether the Central-Wan Chai Bypass is needed.

The Panel appreciates the value of having visions, plans and consensus as part of our collective choice for a better living environment. The public increasingly aspires to a participatory approach towards decision-making. The need to integrate transport with land use planning for long-term sustainability has become abundantly clear and should be addressed by Government as a priority. Greater attention is called for on matters of land use and transport demand management. Pedestrian access to the waterfront must not be overlooked in our quest for an enhanced road network and improved public transport services. Careful appraisal and timely analyses are needed to ensure the sustainability of the chosen development strategy in the short, medium and long term. Deciding on a transport-related investment therefore calls for taking into consideration the environmental, economic and social impacts of the project holistically and comprehensively.

The Panel has held five working group meetings from 24 August to 30 September, 2005 to consolidate members' views and recommendations on the captioned issues. The Panel studied the background reports prepared by the Transport Department for this project and assessed the adjoining areas through site visits. Public participation was fully encouraged throughout, with 19 formal submissions received. A town hall meeting on the Expert Panel Forum to canvas the public's views and to dialogue with participants was held on 3 September, 2005. Taking into account the views and suggestions of all concerned, the Panel has mapped out recommendations in this report in the hope that they could assist Government to better implement sustainable transportation for improving our quality of life.

Ir Prof William H.K. Lam PhD, MSc, BSc, CEng, FHKIE, FIHT, MICE, MASCE, CMILT
Chairman, Expert Panel for Sustainable Transport Planning and Central-Wan Chai Bypass

October 2005

Acknowledgement

The Expert Panel wish to express their gratitude to the Harbour-front Enhancement Committee - Sub-committee on Wan Chai Development Phase II Review for providing the valuable opportunities for a thorough discussion on the important topic of sustainable transport planning.

The Expert Panel's consideration of the issues would not have been so comprehensive without the participation of the public. The Panel therefore like to thank the members of the public who have provided their views in their submissions and/or at the Expert Panel Forum. Further appreciation goes to the Trade Development Council for providing the venue.

The Panel also wish to thank the Environment, Transport and Works Bureau, the Housing, Planning and Lands Bureau, the Civil Engineering and Development Department, the Planning Department and the Transport Department for providing the necessary assistance to the Panel in completing this review and for arranging the public forum, the meetings and the site visits.

Glossary

- CBD - Central Business District
- CFA - Court of Final Appeal
- CHT - Cross Harbour Tunnel
- “the Corridor” - The east-west Connaught Road Central/Harcourt Road/Gloucester Road Corridor along the northshore of the Hong Kong Island
- CTS - Comprehensive Transport Studies
- CWB - Central - Wan Chai Bypass
- EHC - Eastern Harbour Crossing
- EIRR - Economic Internal Rate of Return
- ERP - Electronic Road Pricing
- Expert Panel Forum - Expert Panel Forum on Sustainable Transport Planning and Central-Wan Chai Bypass
- HEC - Harbour-front Enhancement Committee
- HER - Harbour-front Enhancement Review – Wan Chai, Causeway Bay and Adjoining Areas
- HKCEC - Hong Kong Convention and Exhibition Centre
- OZP - Outline Zoning Plan
- PHO - Protection of the Harbour Ordinance
- RC - reserve capacity, for measuring junction performance
- SPH - Society for Protection of the Harbour Limited
- Sub-committee - Sub-committee on Wan Chai Development Phase II Review of the Harbour-front Enhancement Committee
- TD - Transport Department of the HKSARG
- TPB - Town Planning Board
- WDII - Wan Chai Development Phase II
- WHC - Western Harbour Crossing
- V/C Ratio - Volume-to-Capacity Ratio

Chapter 1 Introduction

1.1 Appointment of the Expert Panel

1.1.1 The Harbour-front Enhancement Committee (HEC) was established in May 2004 to advise the Secretary for Housing, Planning and Lands of the Government of the Hong Kong Special Administrative Region, on the planning, land uses and developments along the existing and new harbour-front of the Victoria Harbour. The HEC has set up a Sub-committee on Wan Chai Development Phase II Review (Sub-committee) to advise the Government on a planning and engineering review on WDII (WDII Review). The background leading to the WDII Review is briefly described in Appendix I.

1.1.2 The Government has accepted the recommendation of the HEC to adopt an enhanced public participation approach in the WDII Review. To achieve this, the Sub-committee initiated the Harbour-front Enhancement Review – Wan Chai, Causeway Bay and Adjoining Area (HER) project under its steer and in parallel with the WDII Review. Results of the HER project will provide input to the WDII Review.

1.1.3 The HER project comprises of three stages, the “Envisioning”, “Realization” and “Detailed Planning” stages. It is designed to engage the public before the preliminary planning concepts are drawn up so that members of the community can express at an early stage their visions and aspirations for the sustainable development of the harbour-front with a view to building a consensus. Views and ideas raised by the public will form the basis for preparing the concept plans. Compared to the conventional practice of consulting the public after the planning concepts were produced, this is a new approach. It is hoped that with enhanced public participation at an early stage, the subsequent planning can better respond to public needs and aspirations.

1.1.4 To achieve the objectives of the HER project, five public forums, two community charrettes and an opinion survey were conducted in May to July 2005 under the Envisioning Stage of the project.

1.1.5 The public engagement activities of the Envisioning Stage of HER revealed that while there was a consensus view on enhancing the harbour-front, the public had expressed diverse views on the transport issues. The Sub-committee concluded that an in-depth discussion on the transport issues involving experts in the relevant field was necessary before embarking on the next stage of the HER project. In

this respect, the Sub-committee decided to convene an "Expert Panel Forum on Sustainable Transport Planning and Central-Wan Chai Bypass" (Expert Panel Forum).

1.1.6 In line with the operation of the HEC, the Sub-committee has required the Expert Panel Forum be opened to the public and opportunities be provided for stakeholders and interested parties to make written submissions to the Forum. Subject to this principle, the Panel was given the complete freedom to decide on the detailed arrangement of the Forum.

1.2 Terms of Reference

1.2.1 While acknowledging that a holistic approach is required for the transport planning for resolving traffic congestion problems along the northern shore of the Hong Kong Island and to ensure a sustainable solution which is in line with the harbour planning principles, the Task Force on HER, under the Sub-committee, is of the view that a conclusion one way or the other on the need of the CWB is essential before proceeding to the Realization Stage of HER. For this reason, it was concluded that the terms of reference of the Expert Panel would be to review and make recommendations on the sustainable transport planning for the northern shore of the Hong Kong Island, including the necessity of CWB.

1.2.2 The Panel was not requested to address design details of CWB.

1.3 Membership

1.3.1 The Expert Panel consists of local and overseas experts nominated by the Task Force on HER, Chartered Institute of Logistics and Transport in Hong Kong, Hong Kong Institution of Engineers, Hong Kong Institute of Planners, Department of Civil and Structural Engineering of The Hong Kong Polytechnic University, Department of Civil Engineering of The Hong Kong University of Science and Technology, and Department of Civil Engineering of The University of Hong Kong.

1.3.2 The Expert Panel is chaired by Professor William H K Lam, Chair Professor in Civil and Transportation Engineering of the Department of Civil and Structural Engineering, The Hong Kong Polytechnic University. Other members are:

Prof Michael Bell	Chair Professor in Transport Operations of the Department of Civil and Environmental Engineering, Imperial College London (nominated by the HER Task Force)
Dr Timothy D Hau	Associate Professor of the School of Economics and Finance, The University of Hong Kong (nominated by the HER Task Force)
Dr Hung Wing-tat	Associate Professor of the Department of Civil and Structural Engineering, The Hong Kong Polytechnic University (nominated by the Department of Civil and Structural Engineering, The Hong Kong Polytechnic University)
Ir Wilfred Lau	Director of Ove Arup & Partners Hong Kong Ltd (nominated by the Hong Kong Institution of Engineers)
Prof Lo Hong-kam	Associate Professor of the Department of Civil Engineering, The Hong Kong University of Science and Technology (nominated by the Department of Civil Engineering, The Hong Kong University of Science and Technology)
Ms YY Pong	Vice President of Hong Kong Institute of Planners (nominated by the Hong Kong Institute of Planners)
Dr James Wang	Associate Professor of the Department of Geography, The University of Hong Kong (nominated by the Chartered Institute of Logistics and Transport in Hong Kong)
Dr SC Wong	Associate Professor of the Department of Civil Engineering, The University of Hong Kong (nominated by the Department of Civil Engineering, The University of Hong Kong)

1.4 Work Programme

1.4.1. The Expert Panel was constituted on 18 August 2005. Besides attending the Expert Panel Forum on 3 September 2005 to hear views from the public, the Panel have met six times as follows:

- first meeting on 24 August 2005 – to determine the detailed arrangements of the Expert Panel Forum,
- second meeting on 2 September 2005 – to seek clarifications from government departments on the traffic data presented and the land use planning principles,
- site visit on 2 September 2005 to inspect the existing traffic conditions along the Corridor at the Connaught Road Central/Pedder Street junction, Man Yiu Street, Wan Chai Ferry Pier, Harbour Road/Fleming Road junction, Gloucester Road (Causeway Bay section),
- third meeting in the morning of 3 September 2005 - to exchange views among the members,
- fourth meeting on 14 September 2005 – to discuss the recommendations of the Expert Panel and format of the report,
- fifth meeting on 30 September 2005 – to review the preliminary draft report.

1.4.2 To enhance public participation in the process, public's views were invited before the Expert Panel Forum through four channels:

- Two sets of circular letters were sent on 12 and 22 August 2005 respectively to about 700 parties or persons. They included the collaborators of HER (organizations invited to assist and to promote the HER project); members of the Legislative Council, District Councillors of the 18 Districts, Town Planning Board, Transport Advisory Committee and Advisory Council on the Environment; stakeholders along Wan Chai & Causeway Bay harbour-front and those organizations that have made submissions to the Sub-committee at the Envisioning Stage of HER. The letters informed them of the Forum and invited them to make submissions and to attend the Forum.
- Advertisements were placed in the South China Morning Post, Star Post and Metro during the period from 17 to 24 August 2005.

- Notices were sent to about 4,700 community groups, green groups, schools, building owners associations, building mutual aid committees, etc; and

- Three press releases were issued.

1.4.3 Nineteen submissions were received from different organizations and members of the public prior to the forum. Transport Department had also made a submission. . These are summarised in Chapter 2 and the submissions had been uploaded onto the HEC website for public's access *(refer to http://www.harbourfront.org.hk/eng/content_page_/her_pdf_1.html and http://www.harbourfront.org.hk/eng/content_page/doc/Full_Submission.pdf respectively)*.

1.4.4 Having reviewed the submission of Transport Department, additional traffic analysis and information were requested from the Transport Department to ascertain the robustness of the traffic demand model and to verify the assumptions made in the traffic demand model. Supplementary information was subsequently provided by Transport Department (*refer to http://www.harbourfront.org.hk/eng/content_page/doc/SN-en.pdf*).

1.4.5 At the second meeting of the Expert Panel, representatives of the Planning Department and the Civil Engineering and Development Department were invited to explain the land use planning in the Central and Wan Chai area and to explain the possible schemes of the CWB if it is to be built.

1.4.6 At the Expert Panel Forum on 3 September 2005, there were 128 attendants, including 65 members of the public and 9 from the media. A summary of the submissions received prior to the forum was presented and members of the public were given the opportunities to give comments after the deliberation of the Transport Department and after the panel discussion.

1.5 Overview of the Report

1.5.1 The content of this report is outlined as follows and the focus of the Expert Panel's review is on recommending a sustainable solution for relieving the traffic congestion on the strategic route (not the congestion of the local roads).

- Chapter 1 gives an overview of the background of the formation of the Expert Panel and the Works Programme;

- Chapter 2 consists of two main parts. The first part provides the background of the traffic situation in the Central-Wan Chai area based on the information provided by the Transport Department. The second part summarises the views and submissions made by the public; and

- Chapter 3 details the Panel's views as well as short, medium and long-term recommendations for the sustainable transport planning of the Central and Wan Chai area.

- Five appendices are included. Appendix I presents a brief background on the WDII Review. Appendix II lists the organisations and individuals from the public who have submitted comments, suggestions and recommendations during the public consultation process. Locations of the Central-Wan Chai Bypass and Road P2 are indicated on Appendices III and IV respectively. Appendix V contains photo exhibits showing Expert Panel's activities, proceedings and deliberations.

Chapter 2 Submissions

2.1 Submission from Transport Department

2.1.1 Below is a summary of the traffic condition in the Central and Wan Chai areas and the background of the Central-Wan Chai Bypass based on Transport Department's submission. Detailed arguments can be found in the HEC website under *http://www.harbourfront.org.hk/eng/content_page/doc/Full_Submission.pdf* and *http://www.harbourfront.org.hk/eng/content page/doc/SN-en.pdf*.

Existing Road Network

2.1.2 CBD is currently served by the east-west Connaught Road Central / Harcourt Road / Gloucester Road Corridor ("the Corridor"). This Corridor is primarily a dual four-lane urban trunk road serving as a key east-west link for Hong Kong Island North. As an Urban Trunk Road, it bears the responsibility of carrying the long-haul traffic between east and west of Hong Kong Island.

2.1.3 At the same time, the Corridor also serves as a Distributor Road providing north-south connections to various local districts and providing key accesses to its adjacent areas with very short connecting roads. Unfortunately, the numerous junctions with side roads as well as underpasses and flyovers integrated with the Corridor create substantial weaving and merging movements. As a result, the Corridor is over-saturated and too heavily used by local traffic accessing its adjacent areas such that it is unable to perform its intended function as an Urban Trunk Road. Traffic queues from any bottlenecks along the Corridor's side roads or its main section usually result in blockage of other movements and rapid deterioration of traffic condition. A minor accident or incident occurs along or at the vicinity of the Corridor often results in serious congestion and delay in the road network, and in some more serious cases, gridlock of the whole CBD and complete blockage of the Corridor. These are clear indications that the stability and reliability of both the strategic road network and the Central and Wan Chai local road network are in an unsatisfactory state.

Existing Traffic Pattern

2.1.4 The existing Corridor is already operating beyond its design capacity. Congestion along the Corridor is not limited to the typical morning and evening peak hours. Regular traffic congestion can be

observed between 8 a.m. and 8 p.m. during weekdays. Eastbound traffic heading for the CBD often queues back to the WHC approach along the Rumsey Street Flyover and also the at-grade Connaught Road Central. Westbound traffic moving towards the CBD often tails back to Gloucester Road near the Wan Chai Sports Ground.

2.1.5 Regular traffic queues along the Corridor are also found in the direction to the CHT, the Aberdeen Tunnel and the Causeway Bay area. These regular traffic queues occupy the road spaces of the Corridor and impose unnecessary delay to the through traffic between the eastern and western parts of Hong Kong Island.

Traffic Forecasts

2.1.6 Five sets of traffic forecasts were undertaken to simulate the traffic situation at the Central, Wan Chai and Causeway Bay areas by 2016. Peak hour traffic flows were simulated for these test scenarios.

2.1.7 The assumptions of the five test scenarios are as follows:

Scenario A - With CWB, with Road P2, with the slip roads in Wan Chai Development Phase II, and with the proposed developments in Central Reclamation Phase III.

Scenario B - Without CWB, without Road P2, without the slip roads in Wan Chai Development Phase II, and with the proposed developments in Central Reclamation Phase III.

Scenario B1 - Without CWB, without Road P2, without the slip roads in Wan Chai Development Phase II, and without the proposed developments in Central Reclamation Phase III.

Scenario C - With CWB, with Road P2, without the slip roads in Wan Chai Development Phase II, and with the proposed developments in Central Reclamation Phase III.

Scenario D - With CWB, without the at-grade road P2, without the associated slip roads in Wan Chai Development Phase II, and without the proposed developments in Central Reclamation Phase III.

2.1.8 The results of the test scenarios show that CWB with the slip roads in Wan Chai and Road P2 are required even if there is no new development in Wan Chai Development Phase II and if all the not-yet-started developments in Central Reclamation are removed. The summary of results is given in the table below.

Table 1 : Summary of Modeling Assumptions and Results of the 5 Test Scenarios

	CWB	Road P2	Wan Chai Slip Roads	Develop -ments in CR III	Traffic Modeling Results	
					V/C Ratio of Major Roa Sections along the Corridor	RC of Major Road Junctions in Central & Wan Chai
Scenario A	✔	✔	✔	✔	Generally below 1, except along the westbound Inner Gloucester Road.	Generally with some RCs.
Scenario B	×	×	×	✔	All above 1.2 along both eastbound and westbound. Some as high as 1.55.	Most of the critical junctions have negative RCs.
Scenario B1	×	×	×	×	Most of the west- bound road sections with v/c ratio above 1.2. Some as high as 1.53.	Many of the critical junctions have negative RCs.
Scenario C	✔	✔	×	✔	Many of the east- bound road sections with v/c ratio above 1. Some as high as 1.13.	Some critical junctions have negative RCs.
Scenario D	✔	×	×	×	Most of the east- bound road sections with v/c ratio above 1. Some as high as 1.13.	Most of the critical junctions in Wan Chai have negative RCs.

Notes: V/C Ratio = Volume over Capacity Ratio for road links; RC = Reserve Capacity for signal junctions

Summary of Transport Department's Submission

2.1.9 The east-west Corridor serving the CBD on Hong Kong Island is already operating beyond its capacity as can be observed on site. Previous and recent strategic transport studies have predicted further increase in traffic demand along the east-west Corridor, and confirmed the need for a parallel waterfront trunk road, the CWB, to avoid more extensive and frequent traffic congestion and even gridlock in the road network.

2.1.10 Traffic management and fiscal measures are already in place to maximize the capacity of the existing road network and suppress traffic demand. Further measures including ERP have also been considered. All these existing and proposed measures, however, cannot resolve the traffic congestion problem along the east-west Corridor. In other words, the CWB is essential, and ERP can complement the CWB but cannot replace it.

2.1.11 A district traffic study has been conducted to determine the configuration of the CWB. The study confirmed that the CWB is required, and that intermediate slip roads are essential to achieve the objectives of building the trunk road, i.e. to divert traffic away from the existing east-west Corridor and to provide adequate relief to it.

2.2 Submissions from the Public

2.2.1 Nineteen submissions from the public were received before the Expert Panel Forum on 3 September 2005. The 19 submissions from various organisations / individuals have been uploaded in the website under *http://www.harbourfront.org.hk/eng/content_page/her_pdf_1.html?s=1*. A list of organisations and individuals who have submitted views and recommendations is presented in Appendix II.

2.2.2 Some submissions support the Government's initiative of providing additional infrastructures, i.e. the construction of CWB to cope with the anticipated future traffic demand. On the other hand, some submissions are against the provision of CWB. Furthermore, there are views on sustainable transport planning.

2.2.3 A summary of the public views, classified according to the following three categories, namely, *Support the Provision of CWB*; *Against the Provision of CWB*; and *Other Views*, is given below.

Support the Provision of CWB

2.2.4 Public views supporting the provision of CWB are as follows:

- Traffic should be diverted and not blocked.
- CWB would benefit the entire community.
- CWB would alleviate traffic congestion and improve the operating environment.
- The aesthetic of the Victoria Harbour is important but should not impede economic growth
- Major roads in Wan Chai are operating beyond capacity and there is an urgency to build the CWB.

2.2.5 In supporting the provision of CWB, some of the submissions include the following conditions and provisions:

- All viable alternatives should be fully examined and exhausted, including the implementation of all traffic demand measures and alternative modes of transport for handling traffic generated by developments that have already commenced operation.
- The CWB would be designed to take existing surface road traffic underground.
- The CWB would be underground along the harbour-front past Fenwick Pier with offloading pontoon positioned as close as

possible to Fenwick Pier for easy access to the harbour for visiting sailors of all nations.

- Traffic lights or crossing places near Fenwick Pier would be included in the plans.
- The traffic impact would be assessed; the toll levels of the existing 3 tunnels would be equalised; a more comprehensive ERP system for all traffic entering the CBD would be implemented; and CWB would not be at-grade.
- Tunnel instead of viaduct or at-grade alignment be adopted.
- CWB would be connected to Hing Fat Street in the east and Fenwick Street in the west by two ramps. It was believed that this scheme would minimize reclaimed land, divert traffic and help to beautify the waterfront.
- Victoria Park would be extended to the waterfront corridor and the existing Victoria Park Road would be reconstructed as a tunnel under the Victoria Park to encourage the public to walk between the park and the harbour front.
- Alternative CWB interchange options at Wan Chai North to facilitate a right turn movement into Fleming Road from Road P2 would be provided; the amount of reclamation would be reduced; most of the existing facilities and continuous pedestrian access at-grade would be provided to the Wan Chai water-front.
- A major consideration in the development of CWB should be harbour-front enhancement to facilitate public enjoyment of the waterfront.

Against the Provision of CWB

2.2.6 Public views against the provision of CWB are as follows:

- The public could not see the justification for the proposed 4-lane at grade road in addition to any bypass. This would increase the dislocation of the harbour-front from the rest of Wan Chai and degrade the area in terms of aesthetics.
- All traffic measures had to be implemented first before any further construction of new road infrastructure is initiated.
- The decision by Government in April 2005 to implement measures to balance the traffic flow of the three cross-harbour tunnels must be expedited. This means balancing the toll rates amongst them, especially the central and western tunnels.

- One through lane on existing road to carry 40% of the traffic would be desirable.
- Sufficient effort to exhaust all alternatives to resolve traffic congestion without the need of reclamation had not been made. Nevertheless, the traffic congestion needs to be resolved.
- It is in conflict with the Protection of Harbour Ordinance, the Harbour Planning Principles and the enhancement of the harbour-front.
- It is reasonable to expect that all alternative forms of transport would be implemented first before introducing any new road infrastructure. In line with this view, the construction of the Northern Island Line, Sha Tin / Central Link, and Airport Railway extension would help reduce congestion. Advancing the implementation of the West Island Line on or before 2012 would also relieve traffic congestion.
- Railways could improve accessibility to the waterfront and north of Gloucester Road.
- Running twice the number of cross harbour trains could improve the congestion problem.
- Not building the CWB would save expenses related to building the bypass (no construction contract penalty).

Other Views

2.2.7 Other public views are as follows:

On ERP

- There was no need to wait for an alternative vehicular corridor before ERP is implemented.
- A shorter wheel base for buses and coaches (promoted with ERP) should be considered.
- According to the HEC survey, 70% of the people had no objection to ERP in principle or have no opinion.
- The ERP Study should be updated.
- Four (4) approaches of road pricing could be considered: Corridor, Area Scheme, National and Trans-national Systems (charging on distance travelled), and Integration (charging across transport modes).

- 10 strategies were recommended for implementing road pricing, which includes: making it part of an integrated transport strategy, making use of funds acceptable to the public, maintaining flexibility in policy making etc.
- ERP would deter traffic from entering Wan Chai but would not provide any alternative diversion route, was not supported.
- ERP was considered not acceptable unless the taxi industry would be excluded.
- A more comprehensive ERP system for all traffic entering the CBD shall be considered if price equalisation on the three tunnels could not resolve the traffic problems.
- The strategy for implementing road pricing should be: Has congestion become intolerable? Have all other remedies been tried? Is road pricing politically viable?

On Integrated Land Use and Transport Planning

- Transport issues should not be treated as ancillary to but integrated into the land use planning process. Any decision to build new transport infrastructure should only be considered when all viable alternatives, including the intelligent use of existing infrastructure, had been examined and exhausted. Measures to resolve the existing and projected traffic problems should be extended beyond traffic management and fiscal measures.Existing/planned land uses and development density/intensity should be reviewed.
- The projected traffic increase should be reviewed in view of the reduction and deletion of the proposed developments on Central and Wan Chai Reclamation, Green Island Reclamation, Green Island Link to Lantau and the Container Port and Route 7.
- The Central District (Extension) OZP potentially allowed for nearly 13 million sq. ft. of Gross Floor Area to be added in the future would add substantial traffic to the harbour-front. Plans to add an extension to the Hong Kong Convention and Exhibition Centre would likewise increase traffic.
- Refer the Central (Extension) OZP back to the Town Planning Board and amend the current draft Wan Chai North OZP to remove all reclamation based on land for the bypass.
- The demand for the through traffic was possibly due to the additional density planned for the CBD and Wan Chai, particularly high-level developments, i.e., skyscrapers, etc.

- The current industrialisation of the area (a sewage treatment plant, an electricity sub-station and an LPG station and a proposed electrical transformer on Wan Shing Street) is against greening and beautifying the harbour-front area.
- The typhoon shelter, yacht club, rest area, food court, waterfront corridor with pedestrian facilities to between Central and Wan Chai, cycle path and running track should be maintained.
- Existing occupancies in Wan Chai North should be acknowledged as a key feature of this area.

On Possible Improvement Measures

- The problem was not through traffic, but stacking of local traffic because of limitations in the surrounding areas to absorb traffic. These included stacking of Causeway Bay traffic and Times Square traffic etc.
- Signalisation, parking policies, traffic calming, etc should be improved.Loading / unloading should be allowed at night time only.
- All commercial vehicles except franchised buses and trams between the Western and Central tunnels and above Connaught Road / Gloucester Road from 8am to midnight daily be banned.
- To establish pick-up and drop-off zones for taxis, minibuses, school buses and residents' buses along the waterfront north of Connaught Road / Gloucester Road. Passengers were to transfer to franchised buses from there, or walk.
- Taxi queue for the LPG station should be regulated.
- Convention and exhibition traffic be better managed.
- Traffic light sequencing should be corrected or the right-turn into Marsh Road be banned.
- Traffic lights or crossing places near Fenwick Pier be improved.
- Escalator network should be expanded. Improved / maintained ease of access for general public to Wan Chai North should be provided; improved parking for both Wan Chai North occupancies' operational vehicles and visiting general public should be provided.
- The environmental impact should be closely monitored during construction to minimize the negative impact to the harbour.

Chapter 3 Panel's Views and Recommendations

3.1 Sustainable Transport Planning

Concept of Sustainability

3.1.1 "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs," according to the so-called Brundtland Report of the United Nations (The World Commission on Environment and Development, 1987, p. 43). The Panel regards sustainable transportation as meeting our social, economic and environmental goals for today and tomorrow.

Objective of Sustainable Transportation

3.1.2 The Panel further recognizes the objective of sustainable transportation is to manage travel demand and to provide adequate transport facilities in a timely manner. This pursuit is fully consistent with the tripartite principles as espoused in the Hong Kong Government's green and white papers of internal transport policy (Hong Kong Government, 1974, 1979, 1989, 1990).

Key Issues in Sustainable Transport Planning

3.1.3 The Panel considers that the following are the key issues to be considered in the planning of sustainable transportation:

- *Integrated land use and transport* – Being interrelated, land use and transport planning ought to go hand in hand. Hong Kong is now at the stage where land-use planning needs to take as given transportation infrastructure requirements. Therefore land use development has to be planned to take into account travel demand, particularly in urban areas where the scope for further transport infrastructural development is severely restricted.
- *Consideration of environmental, economic and social factors and their interaction* – When appraising transportation investment, the economic, environmental and social impacts of the transport investment should be evaluated comprehensively and holistically.
- *Multi-modal and multi-faceted approach* – Sustainable transportation encompasses the gamut of transport facilities and

carriers (such as road, rail, ferry, motor vehicles and non-motorized transport) as well as travellers with differing characteristics.

- *Use of appropriate means or technology* – Selecting the right tool to tackle a particular problem – be it by simply painting white lines, providing information for public transport riders, expanding transport infrastructure capacity (including road and rail), charging for road use, or a combination thereof – should be done fittingly.
- *Balance of demand and supply* – Travel demand, being dynamic, changes as the land use and activities in an area changes. In order to balance travel demand and transport supply appropriately, short-term and long-term land-use plans must be reviewed regularly and adjusted accordingly.
- *Efficient use of existing infrastructure* – In congested situations, a suitable package of transport management measures (such as bus route rationalization, loading and unloading restrictions, road use charging and so forth) is warranted to ensure more efficient utilization of existing transport facilities. Road use charging is needed over the long term to ensure the sustainability of the heavily-utilized transport infrastructure.

3.2 The Need for Central-Wan Chai Bypass

Problem Statement

3.2.1 The Panel notes that the east-west Connaught Road Central / Harcourt Road / Gloucester Road Corridor (hereafter the Corridor) is important locationally and strategically as it brings traffic from Hong Kong Island to the rest of the territory including Tseung Kwan O and Sai Kung to the northeast, the Hong Kong International Airport to the west and as far north as the boundary with the Mainland. Without a bypass, the corridor along the northern shore of Hong Kong Island would result in a steady increase of bottlenecks and traffic snarls. The so-called Central – Wan Chai Bypass (hereafter the Bypass or CWB for short) therefore constitutes a missing link in Hong Kong's strategic transport network. The reliability of the road network in the Central and Wan Chai area is of paramount importance as an ugly accident on this east-west strategic link would paralyze the road network all the way to the Kowloon side. The resultant losses to society in time wasted, fuel

burnt and resources dissipated are costly and intolerable. We as a community have in fact witnessed all too recently (on 9 May, 2005) just such a traffic incident that paralyzed our transport network and resulted in chaos throughout Hong Kong. In such a situation, the problem of network reliability looms large and cannot be addressed effectively by road use charging *per se*, short of unacceptably steep prices: the establishment of an alternative route is called for.

3.2.2 The Panel regards the recurrent congestion at the east-west Connaught Road Central / Harcourt Road / Gloucester Road Corridor and the adjoining areas to be socially, economically and environmentally unacceptable. Analysis of the data has shown that even using complementary traffic management and fiscal measures to curtail vehicular growth and travel demand – short of Draconian measures – would be ineffectual and socially undesirable.

The Need for an Alternative Route

3.2.3 Enhancing transportation infrastructure capacity in the Corridor vicinity – which would take several years to fruition – would bring long-awaited relief over the medium haul to the Central and Wan Chai districts and greatly facilitate east-west traffic flow. The Panel therefore recommends the construction of a bypass as a medium-term solution to tackle the problem of deteriorating traffic congestion in the Central and Wan Chai area. The Panel considers that the Central Wan Chai Bypass is essential for improving the network reliability of the east-west link. In the process of arriving at this conclusion, the Panel carefully addressed several important questions.

Key Questions to be Answered

3.2.4 *Is doing nothing sustainable?* The Panel's unequivocal answer to the "do-nothing" option is 'no'. Based on standard traffic forecasting techniques, the Panel finds that the existing road network would not be able to cope with travel demand a decade from now despite assuming nil car growth and no further land development in the Central and Wan Chai area.

3.2.5 *Is the provision of the Central - Wan Chai Bypass alone sustainable?* The Panel's answer is also unequivocally 'no'. Since the Bypass has a finite capacity, growth of travel demand over a decade would overrun its capacity. Long term sustainability of the road network

hence calls for transport management measures and road use charging to produce more efficient infrastructure utilization.

3.2.6 *Can implementing road pricing* per se *solve the problem at hand?* The Panel notes that no measure alone can serve as a panacea. Road pricing, which is in line with the 'user pays principle', refers to the optimal setting of congestion tolls under road use charging. Electronic road pricing (ERP) and area licensing, for instance, are but two types of congestion charging mechanisms with varying cost-effectiveness. Without infrastructural enhancement and traffic management measures, the optimal toll level required for road pricing to be effective under the currently congested situation – even without hyper-congestion taking place – would be extremely high, with issues of public acceptability coming into play. Social acceptance is uncertain at this stage in time, given that there are several unresolved issues regarding the design of congestion charging schemes suited for Hong Kong and their associated impacts, which would necessitate careful study and deliberation by both decision-makers and concerned citizens. The Panel therefore considers that road pricing in and of itself could not yet be considered a feasible option within the time frame in question.

3.2.7 *Is CWB and accessibility to the waterfront mutually exclusive?* The Panel's answer is again 'no'. However, the Panel regards Harbour-front enhancement to facilitate access to the waterfront and the enjoyment thereof by the public should be made a priority in the development of the Bypass.

3.2.8 *Is stopping development an acceptable and sustainable solution to road congestion?* The Panel considers that while zero development is always an option, the associated resource mobilization opportunities (in terms of foregone land rents, for instance) should be explicitly accounted for. However, sustainability calls for a proper balancing of economic, social and environmental considerations. This balance could not be achieved by halting development.

3.2.9 *Are the Bypass and electronic road pricing mutually exclusive?* The Panel observes that long-term sustainability warrants the implementation of both electronic road pricing and the construction of the Central - Wan Chai Bypass.

3.3 Recommendations

Short-Term Measures

Transportation Management Measures

3.3.1 The Panel recognizes the need for short-term transport management measures such as loading/unloading restrictions, junction improvement, public transport route rationalization, etc., to tackle the traffic congestion problem on the Corridor prior to the opening of the Bypass.

Tunnel Toll Adjustment

3.3.2 The Panel recommends that Government should seriously consider differential tolling (i.e., tolling by time of day) by revamping the tolling arrangements of the three tunnels traversing the Victoria Harbour as a mitigating measure prior to the opening of the CWB. A viable scheme agreed to by stakeholders would go some distance towards cutting down the backups and gridlocks at the entrances of the harbour tunnels, thereby easing east-west traffic flow.

Managing Development Programme

3.3.3 The Panel recommends that Government address the need to regulate land-use developments throughout the Corridor area in order not to aggravate the congestion problem in the Corridor before the Bypass opens.

Pedestrian Access to the Waterfront

3.3.4 The Panel recommends that Government consider carefully the need for decent pedestrian access to the Victoria Harbour. The Panel notes that pedestrian accessibility to the harbour-front would be enhanced in the proposed development plan as compared to the existing situation. However, facilities for improvement of pedestrian access to the waterfront should also be provided in the interim.

Medium-Term Measures

Enhancing the Multi-modal Transport Network

3.3.5 Since the existing transport infrastructure facilities could not meet current and future vehicular demand by 2016, the Panel supports the construction of the CWB to improve the reliability of the road

network and to enhance multi-modal public transportation in the Corridor. The inability of the present infrastructure capacity to cope with present and future travel demand would persist even if development in the Central reclamation area were stopped and territory-wide car ownership held unchanged from now until 2016.

3.3.6 The Panel further supports the provision of slip roads at the Hong Kong Convention and Exhibition Centre area and at the Victoria Park Road / Gloucester Road / Hing Fat Street passageway to magnify the benefits of the CWB.

Environmental and Social Concerns

3.3.7 The Panel supports the call for the enhancement of the Victoria harbour-front and recommends that Government properly address the visual and environmental impacts and social concerns arising from the construction of the multi-billion dollar Bypass, in addition to improving pedestrian access in the short term.

Road P2

3.3.8 The Panel recognizes the need for Road P2 as an important *ad interim* measure in addressing traffic congestion in the Central reclamation area before the Bypass comes about. The Panel suggests that Government review the scale of P2 to match the gradual land development programme. While it may be necessary to reserve sufficient land for the full-scale development of Road P2 over the longer term, the Panel further recommends that Government explore introducing *pro tempore* traffic calming measures (such as speed bumps, euphemistically called 'sleeping policemen') on Road P2 and greening the reserve area in the meantime.

Road Pricing

3.3.9 The Panel recognizes the vital importance of road pricing as a sustainable transport measure in internalizing traffic congestion externalities and lowering vehicular emissions in busy areas, which would improve air pollution and the quality of life. However, due to the wide variety of road pricing schemes that could be introduced, the Panel recommends that Government seriously consider implementing road pricing after undertaking a detailed assessment of the viability of alternative pricing schemes (electronic or otherwise), their relative effectiveness and social acceptability.

The Complementariness of Road Pricing and the Bypass

3.3.10 The Panel recognizes that road pricing is a complementary measure to the construction of the Bypass. Because of the opening of

the CWB – scheduled to take place in 2012 – dovetails with the expected lead time for the implementation of electronic road pricing, the Panel recognizes a window of opportunity exists to introduce ERP at the opening of the CWB. Integrating ERP with road capacity enhancement thereby constitutes a package of measures that is more likely to be publicly acceptable and truly sustainable over the long term.

Long-Term Measures

Holistic Approach towards Transport/Land Use Planning

3.3.11 For sustainable transport planning, traffic demand needs to be managed and planned in a holistic manner. A need for the simultaneous integration of land use and transport planning therefore follows. The Panel recognizes that Government has been taking an interactive approach towards land use and transport planning, and recommends that Government fortify this integration, placing due emphasis on the limitation of excessive transport infrastructural development in heavily congested areas.

An Area-wide Pedestrian Network to the Harbour-front

3.3.12 The Panel recognizes the community's growing aspirations for pedestrian access to the harbour-front and recommends the development of an area-wide pedestrian network linking the waterfront with the hinterland as well as to all means of transport modes, thereby connecting motorized and non-motorized transportation in a holistic way.

Incident Management Capability

3.3.13 The Panel recommends that Government strengthen the management of traffic incidents along the Corridor to augment the reliability of the expanded road network in the Central and Wan Chai area, bracing oneself for the heightened risks associated with network paralysis from severe traffic incidents.

The Maintenance of Reserve Capacities

3.3.14 The Panel further recommends that Government review reserve capacities in the transport infrastructure to better the safety margin. For example, if the optimal volume-to-capacity (v/c) ratio – a standard indicator reflecting the performance of a road – on a highway is close to 0.9, it should be taken as a signal for stemming land use development.

Sustainable Transportation

3.3.15 To improve the quality of life in our community, the Panel recommends that Government review and adopt best practices in sustainable transportation for Hong Kong. The Panel recognizes the need for Government to develop integrated policies, strategies and packages for sustainable transportation in Hong Kong for both motorized and non-motorized transportation. For instance, while the share of public transportation would likely be increased due to a combination of an enhanced road network, appropriate road use charging measures and integrated land use and transport planning, Government could seize the opportunities to rationalize multi-modal public transport routes and improve connectivity with rail.

REFERENCES

World Commission on Environment and Development (1987), *Our Common Future*, Oxford: Oxford University Press. This is also known as the Brundtland Report of the United Nations.

Hong Kong Government (1974), *Transport in Hong Kong: A Paper for Public Information and Discussion*, Green Paper on Internal Transport Policy, Hong Kong, May, 16 pp.

Environment Branch (1979), *Keeping Hong Kong Moving: The White Paper on Internal Transport Policy*, Government Secretariat, Hong Kong, May, 47 pp.

Transport Branch (1989), *Moving into the 21st Century: The Green Paper on Transport Policy in Hong Kong*, Government Secretariat, Hong Kong, May 45 pp.

Transport Branch (1990), *Moving into the 21st Century: Transport Policy in Hong Kong*, Government Secretariat, Hong Kong, January, 46 pp.

Appendix I Brief Background Leading to the WDII Review

The Government gazetted the draft Wan Chai North Outline Zoning Plan (OZP) under the Town Planning Ordinance in April 2002. It covered the area bounded by the western edge of Hong Kong Exhibition and Convention Centre (HKCEC) at the west, the eastern breakwater of the Causeway Bay Typhoon Shelter and Hing Fat Street at the east and the Gloucester Road at the south. Among others, the OZP indicated Government's proposals for the CWB and for enhancing the harbour-front at Wan Chai North and Causeway Bay.

In February 2003, the Society for Protection of the Harbour Limited (SPH) applied for judicial review of the decisions of the Town Planning Board (TPB) made in connection with the draft Wan Chai North OZP on the interpretation of the Protection of the Harbour Ordinance (PHO). The judicial review was ultimately determined by the Court of Final Appeal (CFA), which handed down its judgment on 9 January 2004.

According to the CFA judgment, the presumption against reclamation specified in the PHO can only be rebutted by establishing an overriding public need for reclamation. This need (i.e., the economic, environmental and social needs of the community) must be a compelling and present need with no reasonable alternative to reclamation (all circumstances including the economic, environmental and social implications should be considered). A compelling and present need goes far beyond something which is "nice to have", desirable, preferable or beneficial. But on the other hand, it would be going much too far to describe it as something in the nature of the last resort, or something which the public cannot do without.

In the light of the CFA judgment of 9 January 2004, Government has undertaken to conduct a planning and engineering review ("WDII Review") on the draft Wan Chai North OZP and the area in between the eastern construction limit of the Central Reclamation Phase III project at about Lung King Street and the HKCEC to ensure full compliance with the requirements of the PHO and the CFA judgment. The WDII Review commenced in March 2004.

Appendix II List of Organisations / Individuals Who Made Submissions

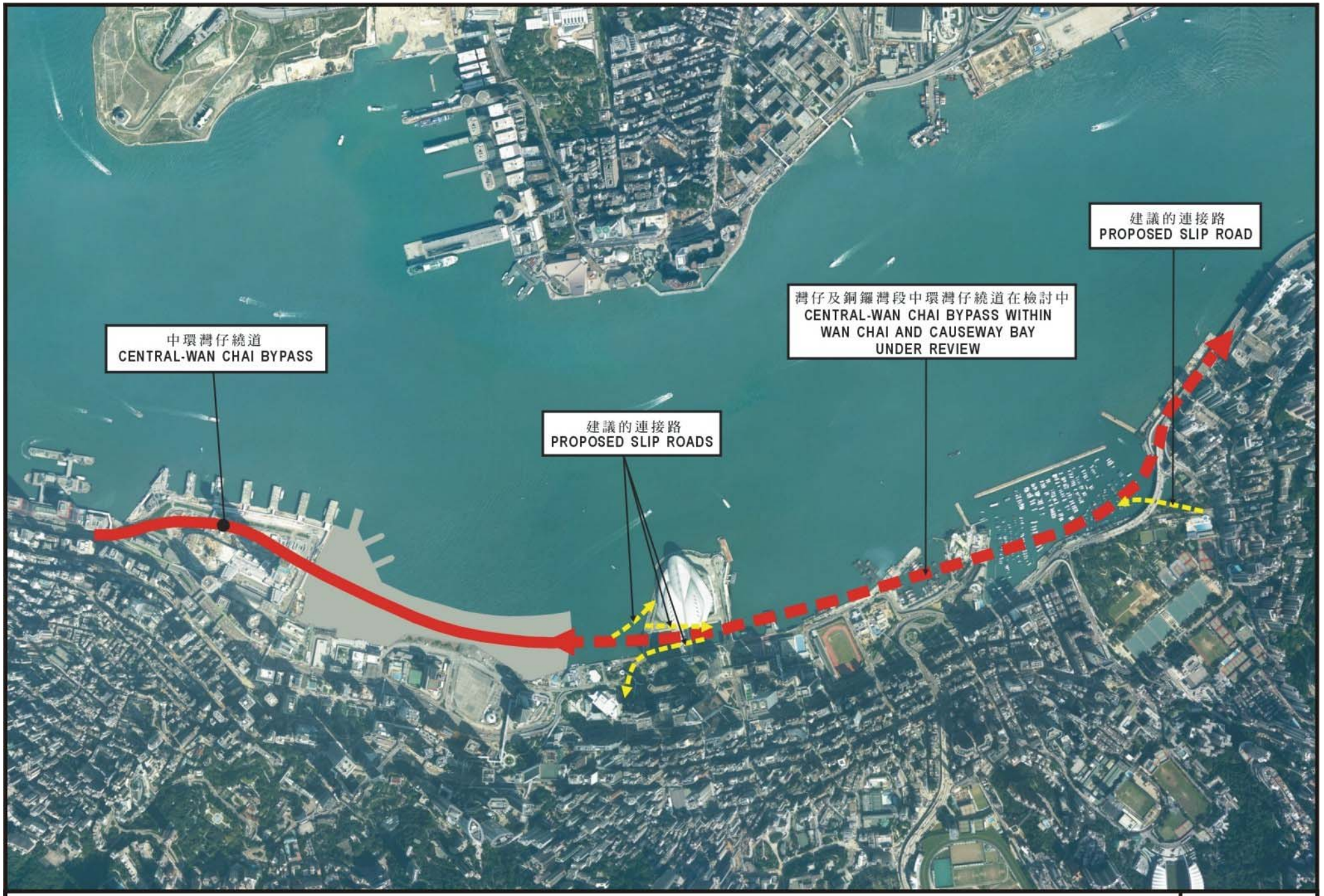
To enhance public participation in the process, public's views were invited before the Expert Panel Forum. Nineteen submissions were received from different organizations and members of the public prior to the forum. A list of organisations and individuals who have submitted their views and recommendations is presented in the table below.

A1 : Submissions from Organizations / Individuals

Ref.	Name of Organization/Individual	Subject	Date
1	Servicemen's Guides Association	(no title)	15-Aug-2005
2	Member of Public	Central Traffic Suggestion	17-Aug-2005
3	Member of Public	(no title)	23-Aug-2005
4	Clear the Air	(no title)	23-Aug-2005
5	Save Our Shorelines	The submission of Save Our Shorelines is a report prepared by Deloitte Research titled 'Combating Gridlock: How Pricing Road Use Can Ease Congestion' and the report is available to the public through the website of Deloitte Research at www.deloitte.com.	23-Aug-2005
6	Chairman of the Planning, Traffic and Environmental Protection Committee of the Wan Chai District Council Mr Stephen Ng Kam-chun	(no title) *	25-Aug-2005
7	Swire Properties Ltd	(no title)	25-Aug-2005
8	Society for the Prevention of Cruelty to Animals (HK)	(no title)	25-Aug-2005
9	Trade Development Council	(no title)	26-Aug-2005
10	MTR Corporation Ltd	(no title)	26-Aug-2005
11	The Kowloon Taxi Owners Association Ltd	Support the construction of the Central-Wan Chai Bypass *	26-Aug-2005
12	Harbour Business Forum	(no title)	26-Aug-2005
13	Legislative Councillor Dr Hon Kwok Ka-ki	(no title) *	26-Aug-2005
14	Business Environment Council	(no title)	26-Aug-2005 (Submitted through e-mail on 29-Aug-2005)
15	Civic Exchange	(no title)	29-Aug-2005
16	Society for Protection of the Harbour Ltd	Review of Central-Wan Chai Bypass - Is it really needed?	30-Aug-2005
17	Designing Hong Kong Harbour District	(no title)	26-Aug-2005 (Submitted through e-mail

Ref.	Name of Organization/Individual	Subject	Date
			on 31-Aug-2005)
18	Public Omnibus Operators Association Ltd	(no title)	1-Sep-2005
19	Member of Public	Submission to the Expert Panel	2-Sep-2005

* submission in Chinese only.



中環灣仔繞道位置圖
LOCATION OF CENTRAL - WAN CHAI BYPASS

APPENDIX III

P2 路位置圖
LOCATION OF ROAD P2

APPENDIX IV

APPENDIX V – PHOTO EXHIBITS

Photo 1 - The Expert Panel and the Chairman of the HEC Sub-committee on Wan Chai Development Phase II Review

Photo 2 - The Expert Panel inspecting the traffic conditions along the Corridor

Photo 3 - The Expert Panel Forum on
3 September 2005

Photo 4 - An organization who has made a submission supplementing their views at the Expert Panel Forum

Photo 5 - An attendee expressing her view at the Expert Panel Forum

Photo 6 - Traffic along Connaught Road Central during P.M. peak hour

Photo 7 - Traffic along Gloucester Road during A.M. peak hour

Photo 8 - Traffic along Gloucester Road during P.M. peak hour

Photo 9 -Traffic along Gloucester Road in evening

www.harbourfront.org.hk 3.2006

附件二

優化灣仔、銅鑼灣及鄰近地區海濱的研究

HARBOUR-FRONT ENHANCEMENT REVIEW - WAN CHAI, CAUSEWAY BAY & ADJOINING AREAS

構想階段

公眾參與報告

二零零六年三月

Tables of Contents

FOREWORD

The public engagement project titled “Harbour-front Enhancement Review – Wan Chai, Causeway Bay and Adjoining Area” (HER) was initiated by the Harbour-front Enhancement Committee (HEC) for the purpose of enhancing public participation in the Wan Chai Development Phase II (WDII) Review. Result of the HER project will provide inputs to the WDII Review.

The HER project, which comprises the Envisioning, Realization and Detailed Planning stages, is designed to engage the public before the preliminary planning concepts are produced so that members of the community can express at an early stage their visions and aspirations for the sustainable development of the harbour-front with a view to building a consensus. Views and ideas expressed by the public will form the basis for preparing the preliminary planning concepts. It is hoped that with enhanced public participation at an early stage, the subsequent planning concepts can better respond to public needs and aspirations.

The Envisioning Stage lasted six months from May to November 2005. Public engagement activities held at this Stage included five public forums, two community design charrettes, opinion surveys, an Expert Panel Forum on Sustainable Transport Planning and Central – Wan Chai Bypass (Expert Panel), and a Consolidation Forum. Outcome of these activities are described in this report. Generally speaking, there is consensus on the harbour-front enhancement ideas. Having considered the whole package of recommendations of the Expert Panel, the HEC Sub-committee on WDII Review supported the construction of a Central – Wan Chai Bypass (CWB). However, detailed design of surface transport infrastructure is subject to further study, specifically the impact on harbour-front land use and enjoyment, and reclamation.

Ideas and proposals received during the Envisioning Stage and a number of the recommendations of the Expert Panel have implications which extend beyond the WDII area, the scope of HER and the WDII Review. These proposals and recommendations are noted in the Appendix to this report, and require follow up at appropriate forums.

Having completed the Envisioning Stage, the HER project will progress to the Realization Stage during which Concept Plans including development proposals will be created for evaluation and consensus building using the Harbour Planning Principles and specific sustainability principles and indicators which we have developed during the Envisioning Stage. The Realization Stage will be confined to the ambit of the WDII Review, which extends from the Gloucester Road corridor to the harbour, and the eastern construction limit of the Central Reclamation Phase III project near Lung King Street to the eastern breakwater of the Causeway Bay Typhoon Shelter including some extension into North Point that is contingent upon the construction of the CWB. The harbour immediately in front of this area is also included in this review.

On behalf of the HEC Sub-committee on WDII Review, I would like to express my gratitude to all who participated in the Envisioning Stage of HER, without which the Envisioning Stage would not have been so successful. We hope there will be the same, if not more, public enthusiasm in the ensuing stages of the HER project. We look forward to joining hands with the public towards developing a world class harbour-front for the enjoyment of the residents of Hong Kong as well as the tourists.

Mr. Leung Kong-yui
Chairman, HEC Sub-committee on WDII Review
March 2006



CHAPTER 1 **INTRODUCTION**

1.1 PURPOSE of HER

1.1.1. The draft Wan Chai North Outline Zoning Plan ("OZP") was gazetted on 19.4.2002 proposing reclamation of about 26 hectares for the construction of Central-Wanchai Bypass, relevant road network and land uses. On 9.1.2004, the Court of Final Appeal ("CFA") handed down its judgment in respect of the judicial review on the Draft Wan Chai North OZP (S/H25/1). According to CFA judgment, the presumption against reclamation specified in the Protection of the Harbour Ordinance can only be rebutted by establishing an overriding public need for reclamation.

1.1.2. In the light of the CFA judgment on reclamation, the Government has undertaken to conduct a comprehensive planning and engineering review of the Wan Chai Development Phase II ("WDII Review") to ensure full compliance with the requirements of the Protection of the Harbour Ordinance ("PHO") and the CFA judgment.

1.1.3. The Harbour-front Enhancement Committee ("HEC") was established in May 2004 to advise the Secretary for Housing, Planning and Lands on the planning, land uses and developments along the existing and new harbour-front of the Victoria Harbour. The HEC has set up a Sub-committee, namely the Sub-committee on WDII Review, to advise on the WDII Review.

1.1.4. The Government has accepted the recommendation by the Sub-committee on WDII Review that enhanced participation should be a key element of the Review. To achieve this, a public engagement exercise, namely the "Harbour-front Enhancement Review ("HER") – Wan Chai, Causeway Bay and Adjoining Areas", is being carried out under the steer of the Sub-committee on WDII Review. Results of the HER project will provide inputs to the WDII Review.

1.1.5. In order to achieve a better understanding of the opportunities for waterfront enhancement and to ensure a high degree of community support for the future draft OZP and the draft Recommended Outline Development Plan ("RODP"), a 3-stage Public Engagement Strategy has been formulated so as to enable a more structured approach to be adopted to the HER public engagement activities:

"Envisioning Stage"
- Public to provide their visions, wishes and concepts, as well as Sustainability Principles and Indicators forming as a basis for the development of the Concept Plans

"Realization Stage"
- Public to evaluate Concept Plans to arrive at consensus

"Detailed Planning Stage"
- Ensure draft OZP and draft RODP reflect consensus

1.2 ENVISIONING STAGE

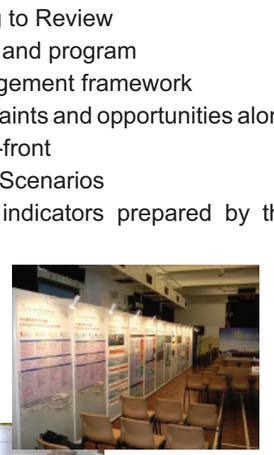
1.2.1. The Envisioning Stage was formally launched on 22.5.2005. The envisioning exercise is to engage the public in identifying the key issues and establishing principles in terms of improving the waterfront. The concept of sustainable development is underpinning the whole HER project. A preliminary set of sustainability ("SD") principles and indicators were prepared by the collaborators at the meeting held on 23.1.2005. The public was subsequently invited to comment on these preliminary principles in order to generate an agreed list of SD principles and indicators. These agreed SD principles and indicators will be used to evaluate the Concept Plans to be developed in the Realization Stage. A wide range of the public engagement activities was undertaken during the two-month public engagement period.

1.2.2. During the first phase of public engagement, the following topics were presented to the public to invite views on the scope of the WDII Review:

- Background leading to Review
- Study methodology and program
- Overall public engagement framework
- Major issues, constraints and opportunities along the subject harbour-front
- Visions/ Alternative Scenarios
- SD principles and indicators prepared by the collaborators

1.2.3. To facilitate public discussion, a Public Engagement Kit ("PEK"), in both English and Chinese, was prepared and widely distributed. In addition, background information, consultation materials and other relevant reports were uploaded onto the HEC's website for public information. An independent website was also launched to provide a platform for the public to respond to an on-line survey and to submit views during the study process. To further publicize the HER, a leaflet summarizing the PEK was prepared and widely distributed for easy reference.

1.2.4. To promulgate the Envisioning Stage consultation, over 4,000 territorial and local organizations including various Associations of Incorporated Owners within the study districts were invited to participate in the engagement activities. Advertisements were posted on Chinese and English newspapers to reach the general public as much as possible.



1.3 COLLABORATORS

1.3.1. To ensure an open and inclusive engagement process, a number of organizations representing different sectors of the public, including the relevant District Councils, community, business, green groups as well as academic and professional institutions have been invited to act as collaborators. They include the following organizations:

• *District Councils*
  – Central and Western District Council
  – Wan Chai District Council
  – Eastern District Council
  – Southern District Council
  – Yau Tsim Mong District Council

• *Local/Community Group*
  – St. James Settlement
  – Caritas
  – Hong Kong People's Council on Sustainable Development

• *Business Groups*
  – Real Estate Developers Association
  – Hong Kong General Chamber of Commerce
  – The Federation of Hong Kong Industries
  – The Chinese Chamber of Commerce

• *Concerned Groups*
  – The Conservancy Association
  – Hong Kong Marine Conservation Society

• *Professional Groups*
  – Hong Kong Institute of Architects
  – Hong Kong Institute of Planners
  – Hong Kong Institute of Surveyors
  – Hong Kong Institute of Engineers
  – Hong Kong Institute of Landscape Architects
  – The Chartered Institute of Logistics and Transport
  – American Institute of Architects (Hong Kong Chapter)
  – Associate of Engineers in Society

• *Academic Institutions*
  – Department of Architecture, The University of Hong Kong
  – Department of Architecture, The Chinese University of Hong Kong
  – Department of Civil Engineering, The University of Hong Kong
  – Department of Public and Social Administration, The City University of Hong Kong

1.3.2. The collaborators have kindly contributed to the Envisioning Stage in the following areas:

(i) reviewing the constraints and opportunities of harbour-front development;
(ii) establishing the preliminary set of sustainability principles and indicators;
(iii) promoting the public participation activities through their network;
(iv) ensuring a transparent and fair process;
(v) acting as panel members or convenors in public forums/ community charrettes



1.3.3. Two collaborators' working group meetings were held on 23.1.2005 and 2.4.2005 respectively. The first meeting focused on the establishment of the preliminary set of SD principles and indicators, while the second one collected advice and comments on the PEK as well as public engagement activities.

1.4 PUBLIC ENGAGEMENT ACTIVITIES

1.4.1. A wide range of public engagement activities have been undertaken during the Envisioning Stage to elicit views and suggestions. To ensure wide public participation from various target groups including those more active concerned groups, stakeholders, local citizens within the WDII project area and citizens not immediately affected by the WDII study, various means of public engagement have been adopted as follows:

Public Forums

1.4.2. To allow face-to-face dialogue and to solicit views from more active concerned groups and stakeholders, forums had been organized in 5 locations on Hong Kong Island and Kowloon. The major objectives of the forums are to collect views and concerns of these groups on their aspirations and principles for waterfront enhancement at Wan Chai, Causeway Bay and adjoining areas, as well as their impact on infrastructure and transport provisions, in particular the possible construction of the Central-Wanchai Bypass. The public forums are also intended to contribute towards establishing a set of SD principles and indicators which will be adopted in evaluating Concept Plans during the Realization Stage of HER.

1.4.3. The 5 public forums were held on the following dates:

• 23.5.2005 (Wan Chai)
• 31.5.2005 (Eastern)
• 2.6.2005 (Central and Western)
• 7.6.2005 (Southern)
• 13.6.2005 (Yau Tsim Mong)


Community Charrettes

1.4.4. Two community charrettes were organized to collect views systematically from the active concerned groups and stakeholders. Unlike public forums which focused on concepts and principles, the community charrettes focused more on design concepts and preliminary concepts within the context of highway options. Very broadly based layout plans had been created by the public at these charrettes to reflect their views. The physical model of the harbour area and 3D models of the highway possibilities were also presented at these public events to ensure that the participants had a clear idea of the issue.




1.4.5. The two community charrettes were held on the following dates:

- 18.6.2005 (Wan Chai)
- 25.6.2005 (Yau Tsim Mong)

Opinion Surveys

1.4.6. To ensure a wider coverage of the public, especially for those who are not immediately affected by the study, different opinion surveys based on different target groups had been undertaken:

- Telephone survey covering all areas on Hong Kong Island, Kowloon and New Territories (randomly selecting respondents who may not be immediately affected by the study)
- Road-side survey around the WDII area (targeting residents, workers, tourists as well as passers-by who may be affected by the WDII study)
- Self-administered questionnaires collected from public forums, community charrettes, online, fax, email and letter (targeting those more proactive members of the public who may not be available for forums/ charrettes)

Written Submissions

1.4.7. To allow the public freely to express their views and suggestions on the WDII study, even though they do not participate in any forums/ charrettes, view collection forms had been designed to solicit public views, and they were attached in the PEK as well as uploaded onto the web-site. During the public forums and charrettes, participants were encouraged to make a written submission about their "One Biggest Wish" for the future harbour-front. Moreover, the public were encouraged to submit their comments, suggestions and proposals in their own format.

1.5 PURPOSE OF THE REPORT

1.5.1. The main purpose of this report is to summarize the public comments received at the Envisioning Stage public engagement exercise. Detailed records of various events, surveys and written submissions have been compiled in the separate Annex Volume.

1.5.2. As these various forms of activities were intended to address slightly different targets in order to allow a more detailed understanding of the public's views, separate chapters (2 to 5) are dedicated to report on the different activities. Chapters 6 and 7 depict discussions in Expert Panel Forum on Sustainable Transport Planning and Central – Wan Chai Bypass and Consolidation Forum respectively. Parallel discussions in the HEC Sub-committee, District Councils, Town Planning Board and Legislative Council are included in Chapter 8. Chapter 9 covers the Conclusions and the Recommendations to the Government for the preparation of Concept Plans and Chapter 10 briefly talks about the Next Steps.

CHAPTER 2 **PUBLIC FORUMS**

2.1 INTRODUCTION

2.1.1. The objectives of the five public forums were to brief the public on the study background and process and encourage the public to voice their concerns and suggestions over the study area.

2.1.2. Public forums began with briefings on the study background and objectives, existing challenges of the harbour-front including the need to address infrastructure and transport issues by the Government officials and the consultants. A floor discussion session was subsequently held to provide a dialogue among the general public, the Government officials and the consultants over the two focus topics, namely harbour-front enhancement and transport issues. Finally, the participants were asked to form groups to provide comments and advice on the preliminary set of SD principles, which were prepared by the Collaborators.

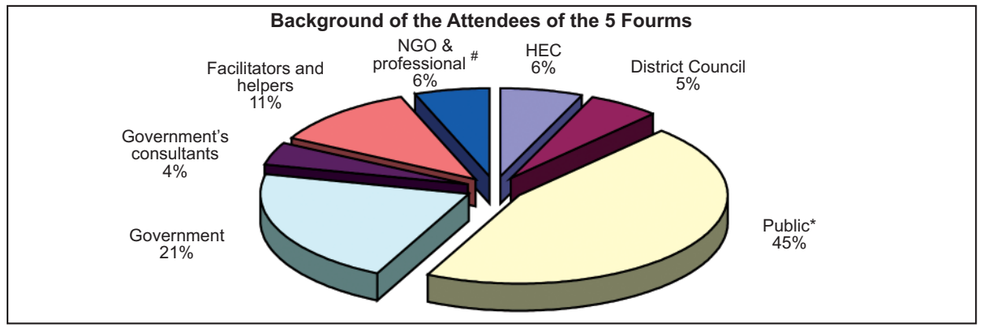
2.1.3. A profile showing the cross section of participants is presented in Section 2.2, followed by a summary of the major points raised in relation to the two focus topics in Section 2.3. The common elements of the sustainability principles and indicators emerging from group discussions are consolidated to a revised set of principles and indicators as shown in Section 2.4. Forum minutes and individual group reports on the discussion are in the Annex Volume.

2.2 CROSS SECTION OF PARTICIPANTS

2.2.1. Public forums were well attended by participants with different backgrounds, including the general public, representatives of Non-government Organizations ("NGO") and professional groups, HEC members, District Council members, Government officials and Government's consultants. A total of 421 attendees participated in the five public forums (Figure 2.1). The general public including citizens, teachers, students and representatives from consultant firms represented the largest group.

Figure 2.1 Background of the Attendees of the Five Public Forums

	HEC	District Council	Public*	Government	Government's consultants	Facilitators and helpers	NGO & professional #	Total
Forums	27	23	191	90	18	48	24	421



.*Public includes citizens, teachers, students and other consultant firms.

NGO and professional groups includes the Association of Engineering Professionals in Society, Hong Kong Trade Development Council, Hong Kong Fishermen's Association, Green Student Council, Save Our Shorelines, Clear The Air, Hong Kong Institute of Architects, New Century, Society for the Prevention of Cruelty to Animals, The Institute of Civil Engineers Hong Kong Office Online, the Associations Of Incorporated Owners, St. James' Settlement, Hong Kong People's Council for Sustainable Development and Hong Kong Marine Conservation Society.

2.3 Main Points of Floor Discussions

Harbour-front Enhancement

Vibrancy

2.3.1. There is a general consensus that the vibrancy of the waterfront should be enhanced with the provision of leisure activities, like cycling, walking, fishing and alfresco dining, and cultural activities. Water sports should also be encouraged to enliven the harbour. Image of harbour-front was considered important.

Connectivity/ Accessibility

2.3.2. Most attendees commented that the connectivity and accessibility of the existing waterfront must be improved to bring more public to the waterfront. To achieve this, an east-west continuous waterfront should be ensured for public enjoyment but more particularly, north-south pedestrian accessibility to the waterfront through a well-designed pedestrian network system should be provided. The present separation of the waterfront from the hinterland should be rectified. Many attendees proposed the extension of Victoria Park towards the waterfront, possibly through a new landscape deck.

Land/ Marine Use Compatibility

2.3.3. Many attendees agreed that to ensure maximum land / marine use compatibility is an important design principle for the waterfront. There should be no large-scale or high-rise buildings along the waterfront, so as to protect the ridgeline. There should also be no residential or office uses along the waterfront, in order to maximize public enjoyment and minimize traffic generation. Moreover, the land requirement for the construction of distributor roads should be minimized to release more land for waterfront and leisure activities.

Cultural and Historical Heritage

2.3.4. The public in general shared the sentiment that the existing cultural and historical heritage along the waterfront, including the Noon-day Gun should be conserved. Reclamation should be minimized to preserve the Victoria Harbour, the natural asset of the society. Causeway Bay Typhoon Shelter is also considered as an important cultural asset. Revitalization of past activities in the Typhoon Shelter like seafood cuisine and sampan tour is recommended to reflect its historical value and to attract tourism.

Environmental Quality

2.3.5. There is a general concern on the environmental quality along the waterfront. Improvement on air and water quality, and noise aspect is highly recommended. To further enhance the surrounding environment, more greenery and landscaping with trees and grassland along the waterfront should be planned.

Immediate Waterfront Improvement

2.3.6. In addition to long-term waterfront enhancement proposals, many attendees were of the view that immediate improvement measures should be implemented, such as releasing available government land for public enjoyment, clearance of illegal uses and installing temporary planters and seating to facilitate public use and enjoyment.

*Transport Case —Arguments **for** the construction of Central-Wan Chai Bypass ("CWB")*

2.3.7. Many attendees considered that traffic congestion along Connaught Road/ Gloucester Road every weekday has become unacceptable. Road traffic conditions in Central, Admiralty and





Wan Chai could be highly unreliable. Traffic congestion has substantially lengthened the travelling time between the east and the west.

2.3.8. An expert in transport planning advised that urban developments including new towns, port and airport have in the past 2 decades been shifting to the west. These activities require the strengthening of the connection between the east and the west. The Bypass has to be built to satisfy the demand that was initiated a long time ago as well as the demand associated with the continuous economic growth.

2.3.9. Some attendees point out that the Bypass, which forms part of the strategic road network in Hong Kong is basically a missing link to solve traffic congestion.

2.3.10. According to another expert in transport economics, ERP in Hong Kong may have to charge around HK$40 for a time saving of 40 minutes to become effective, which would likely be unacceptable to the community. Moreover, building a Bypass is a pre-requisite for the implementation of ERP. From economic and transport planning point of view, pricing and road investment should be implemented to solve the congestion problem in the long term.

2.3.11. Many attendees considered that if the Bypass has to be built, reclamation is acceptable but must be minimized.

2.3.12. Most attendees did not favour an elevated road option for the Bypass, as a flyover would bring visual impact to the waterfront. Tunnel or depressed roads are to be preferred.

2.3.13. Some considered that the Bypass would probably decrease traffic congestion and hence improve air quality. Existing traffic congestion is posing serious air pollution problems in the Wan Chai area.

Government's Response

2.3.14. The Central-Wan Chai Bypass is to complete the missing strategic road link and will effectively tackle the traffic congestion problem along the Connaught Road/ Gloucester Road Corridor. The Government is committed to comply with Protection of Harbour Ordinance and Court of Final Appeal judgment and keep reclamation to the minimum. Any reclaimed land will be put to public use and no land will be reclaimed for the purpose of land sales.

Traffic Case – Arguments against the construction of Central-Wan Chai Bypass ("CWB")

Electronic Road Pricing ("ERP")

2.3.15. Some attendees had the strong view that ERP alone can solve traffic congestion problem. They pointed out that ERP is very successful in UK (congestion charge in London) as about 24% reduction of traffic flows could be made within 2 years. People will react to road pricing, just as people left their cars at home when the toll rose in the Eastern Cross-Harbour Tunnel in May 2005. With ERP, there would be surplus road capacity even without building the Bypass and about 24% of the traffic would disappear.

Demand Management

2.3.16. Some attendees commented that demand management is more important in solving the traffic problems. Toll pricing of the three harbour-crossings can be regulated to redirect traffic effectively and the traffic congestion on Gloucester Road may be relieved.

2.3.17. Some considered that the traffic demand projected by the Government remains questionable as population growth in Hong Kong has slowed down. The demand assumption should be reviewed and the Bypass may not be required.

2.3.18. Others have the view that sustainable land use planning could reduce traffic demand. By minimizing intensive and large-scale development projects along the waterfront, traffic demand will decrease. Additional service roads, namely P2, which would further take up the waterfront site from public enjoyment may not be required.

Mass Transit Railway (MTR)

2.3.19. Some attendees believe that MTR, which has high transit capacity, can contribute towards relieving road congestion. By providing the West Island Line and South Island Line, more passengers would be diverted from road traffic to railway transport system.





Government's Response

2.3.20. The Government does not believe that ERP alone can resolve the traffic problem. ERP can at best be complementary to the CWB. The Bypass is the alternative route for those who do not wish to travel into the ERP area.

2.3.21. Even if the tunnel tolls are harmonized, there is still a need to have a Bypass to channel east-west direction traffic to both Eastern and Western Harbour-crossings. The existing saturated Gloucester Road can hardly play this role. Traffic demand is not only generated from population growth, but also from job opportunities and overall economic growth. It is mainly the latter 2 components, which drive the traffic demand of Hong Kong. Moreover, intensive developments, like the International Financial Center have already been completed in the waterfront. It is impossible to demolish them and reshape the waterfront. In addition, high fuel tax, First Registration Tax and driving licence fees are all in place to limit private car ownership. It is not considered that traffic management alone is sufficient to solve the current traffic problem.

2.3.22. When modelling the traffic forecast, the MTR West Island Line and the Western Harbour-crossing have already been taken into account, but the traffic forecast still shows serious traffic congestion in 2011. MTR cannot accommodate goods movements and the demand of some for point-to-point delivery in Hong Kong. Finally, even if the South Island Line is built, only about 20,000 people would be diverted away from buses. As bus occupation rate is as low as 5% on Gloucester Road, the reduction of 150-160 bus journeys is not sufficient to alleviate the congestion of Gloucester Road.

2.4 Consolidated set of Sustainability Principles

Sustainability Principles and Indicators as Guidelines and Evaluation Tool

2.4.1. Sustainable development stresses the importance of a holistic approach to planning and development. A holistic approach has two facets: the need to take into account social, economic and environmental considerations comprehensively and the need to involve all concerned individuals, organizations and stakeholders into the planning process.

2.4.2. The HER intends to adopt principles of sustainability to ensure holistic and comprehensive planning for the study area. The compilation of a set of sustainability principles and indicators is one of the important steps to such a goal.

2.4.3. On 23.1.2005, nine sustainability ("SD") principles were suggested by the study collaborators. For each principle, some qualitative and quantitative sustainability indicators in the social, economic and environmental arenas were also proposed. The study team took forward the initial set of principles and indicators to the public forums so as to enable the public to further discuss their suitability and significance. Participants at the public forums were encouraged to add to or to amend the initial principles/indicators and they could also restructure the whole set better to reflect their vision and the needs of the study area.

2.4.4. After these events, the views of the public were consolidated into seven sustainability principles. The preliminary set of sustainability indicators were also re-organized to accord with the consolidated set of principles taking into account comments from the attendees. The seven sustainability principles are very similar to five of the eight Harbour Planning Principles except that they may be more specific to the concerns of the Wan Chai and Causeway Bay harbour-front. The remaining three Harbour Planning Principles are more concerned about the planning process and have been repeatedly mentioned during the Envisioning Stage by the public. They are therefore adopted as the fundamental sustainability principles. The consolidated set of principles is shown in Table 2.1 for reference. It is recommended that the list of consolidated sustainability principles and the associated indicators should be used for two purposes:

1) To present as **a set of publicly-initiated sustainable development guidelines** for the planning and development of the study area; and
2) To be used to develop **a set of evaluation criteria** for measuring how well the concept plan(s) meets/ matches the visions of the public

2.4.5. The consolidated sustainability principles represent the stakeholders' aspirations along the Wanchai, Causeway Bay and adjoining areas' harbour-front while the sustainability indicators help to further define the meanings of the principles. The indicators aim to quantify the principles into specific concerns to be addressed. However, not all indicators are quantitative. It is particularly difficult to quantify socio-cultural related indicators. Therefore, we would suggest that the set of sustainability indicators consists of two types: some of the indicators are measurable and can be evaluated (e.g. provision of activity nodes along the links, provision for different modes of access) while some are for indicative purpose to better deliberate the sustainability principles at the concept plan-making level (e.g. creative use of 3-dimensional space and provision of a secure and safe environment).

2.4.6. The sustainability principles and indicators contribute significantly to making the HER a sustainable process and to building consensus with a common yardstick.

Table 2.1 Consolidated Sets of Sustainability Principles and Indicators

FUNDAMENTAL SUSTAINABILITY PRINCIPLES

1. Integrated Planning for a World-class Harbour

2. Sustainable Development for the Harbour

3. Early and Ongoing Stakeholder Engagement

CONSOLIDATED SUSTAINABILITY PRINCIPLES AND INDICATORS FOR HER (DERIVED FROM PUBLIC FORUMS)

Access and Linkages			Uses and Activities		Comfort and Image	
1. Create a Vibrant and Attractive Waterfront that is Continuous and Accessible for All	**2. Ensure Pedestrian Connectivity between the Hinterland and the Waterfront**	**3. Improve Traffic Conditions**	**4. Ensure Land and Marine Use Compatibility**	**5. Enhance Identity by Conserving Natural and Cultural Heritage**	**6. Enhance Environmental Quality along the Waterfront**	**7. Enhance Visual Amenity, Landscape and Quality of Space**
Social Indicators						
• Accessible for all ages, social groups and disability conditions • Access for all at no charge • Diversity in activities for different times and age groups	• Provision of activity nodes along the links • Ease of access by pedestrians including the disabled	• Shorter travelling time within and between districts • Provision for different modes of access	• Provision of facilities to enhance community's enjoyment of the harbour	• Provision of activities which conserve and sustain the existing cultural heritage at the waterfront • Provision of local activities to enhance social attachment to the harbour	• Increase diversity in activities and public enjoyment through improved environmental quality	• Open space suitable for all ages, social groups, and disability conditions • Provision of a secure and safe environment
Economic Indicators						
• Provision of business opportunities (for both day and night time) • Facilitate wide range of economic activity	• Provision of business opportunities along the link • Extension of the economic activities from the hinterland including the old inner districts to the promenade	• Reduction in cost due to shorter travelling time • Lower construction cost and operation cost	• Promotion and revitalization of local business	• Provision of the economic activities with cultural value	• Cost of energy consumption • Cost effectiveness in enhancing environmental quality	• Provision of opportunities for small business with compatible character

CONSOLIDATED SUSTAINABILITY PRINCIPLES AND INDICATORS FOR HER (DERIVED FROM PUBLIC FORUMS) (Continued)

Access and Linkages			Uses and Activities		Comfort and Image	
1. Create a Vibrant and Attractive Waterfront that is Continuous and Accessible for All	**2. Ensure Pedestrian Connectivity between the Hinterland and the Waterfront**	**3. Improve Traffic Conditions**	**4. Ensure Land and Marine Use Compatibility**	**5. Enhance Identity by Conserving Natural and Cultural Heritage**	**6. Enhance Environmental Quality along the Waterfront**	**7. Enhance Visual Amenity, Landscape and Quality of Space**
Environmental Indicators						
• Safe and convenient access for all • Sensitive building height profile to preserve ridgeline • Visual access to waterfront • Provision of open space and community facilities • Create activity nodes/landmarks – identity icon • Provision of infrastructure that will facilitate both water and land activities • Support commercial marine traffic requirements • Minimize land for infrastructure and utilities • Extent of a continuous promenade • Provision of landscaped area with trees	• Provision of landscaped network to enhance pedestrian experience • Visual connectivity between existing and new areas and the harbour • Linkage to public transport facilities • Linkage to old inner districts	• Provision of parking facilities for car/bus/bicycles/coach at the fringe of the new development area • Provision of environmental friendly transport within the promenade area • Access for loading/unloading • Minimize vehicular traffic on surface road • Minimize visual impacts • Minimize environmental impacts • Provision of slip roads at Wanchai/ Causeway Bay • Risks involved with long tunnels	• Provision of linkages and physical connections between land use and marine use • Creative use of 3-dimensional space • Visual connectivity between the existing and new areas and the harbour • Minimize risk of future reclamation by not allowing large scale developments with significant traffic impact • Remove incompatible land uses and marine uses • Flexible use of space along the waterfront	• Visual connectivity between the existing and new areas and the harbour • Sensitive building height profile to preserve ridgeline • Design elements that enhance harbour image • Minimize reclamation • Minimize risk of future reclamation by not allowing large scale developments with significant traffic impact • Compatible land-use with the natural environment • Enhance water quality • Enhance marine ecology • Improve wave conditions • Preserve natural coastline	• Extent of reuse of building materials • Extent of sustainable use of natural resources • Better utilization of existing infrastructure • Facilitate air circulation • Improve air quality • Improve odour condition • Improve noise condition • Improve water quality • Improve marine ecology • Improve wave conditions • Enhance openness • Enhance greenery	• Flexible and sustainable use of space • Provision of facilities to cater for a diversity of user groups • Enhance openness • Provision of landscaped areas with trees • Segregation of pedestrian and vehicular traffic • Sensitive building height profile along the waterfront • Creative use of 3-dimensional space

CHAPTER 3 COMMUNITY CHARRETTES

3.1 INTRODUCTION

3.1.1. The objectives of the two community charrettes were to encourage the participants to prepare broad concept plans to reflect their proposed design themes, solution to transport-related issues and land use components.

3.1.2. At the beginning of the community charrettes, there was a briefing on the views collected in public forums, preliminary results of road-side and telephone surveys, as well as more technical information on transport-related issues. Participants were encouraged to ask questions, if in doubt. Finally, the participants were asked to form groups to propose a main theme, transport solutions, design principles and land use components along the waterfront and to translate the concepts into broad concept plans. Six groups were formed in each charrette. As there was one group producing 2 concept plans, a total of 13 concept plans have been prepared in the two charrettes.

3.1.3. A profile showing the cross section of participants is presented in Section 3.2. The common elements of major themes and design elements are summarized in Section 3.3, while the transport-related proposals and the corresponding land use components are presented in 3 summary plans. Some groups could not agree on the potential solution to the traffic issue. However, the common harbour-front enhancement components are also incorporated into the summary plans.

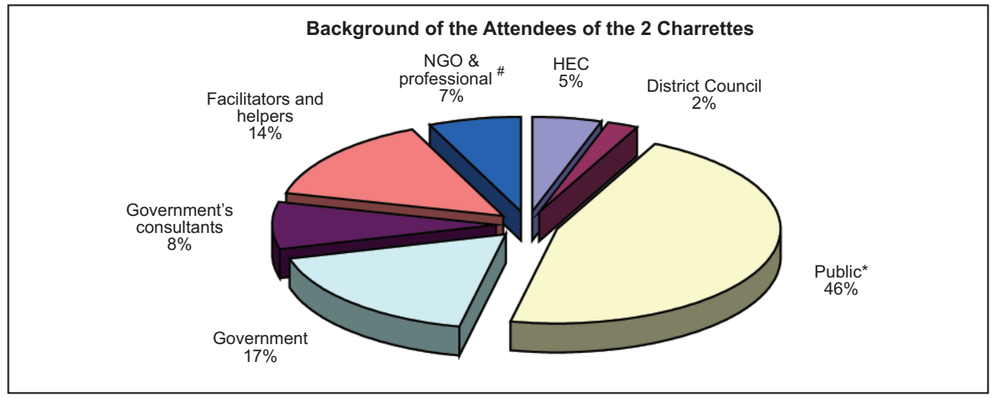
3.1.4. The notes of floor discussions and individual group reports during community charrettes have been compiled in the Annex Volume.

3.2 CROSS SECTION OF PARTICIPANTS

3.2.1. Similar to the public forums, community charrettes were well attended by participants with different backgrounds, namely the general public, Non-government Organizations ("NGO") and professional groups, HEC members, District Council members, Government officials and Government's consultants. There were a total of 223 participants in the two community charrettes (Figure 3.1). The general public, including citizens, teachers, students and consultant firms made up the biggest share of participation.

Figure 3.1 Background of the Attendees of the Two Community Charrettes

	HEC	District Council	Public*	Government	Government's consultants	Facilitators and helpers	NGO & professional #	Total
Charrettes	11	5	103	39	18	32	15	223



* Public includes citizens, teachers, students and other consultant firms.

NGO and professional groups includes the Association of Engineering Professionals in Society, Hong Kong Trade Development Council, Hong Kong Fishermen's Association, Society for Protection of the Harbour Ltd, Clear The Air, The Chartered Institute of Logistics and Transport in Hong Kong, Hong Kong Institute of Planners, Hong Kong Institute of Engineers.

3.3 MAJOR PROPOSED THEMES AND URBAN DESIGN PRINCIPLES

Major Themes

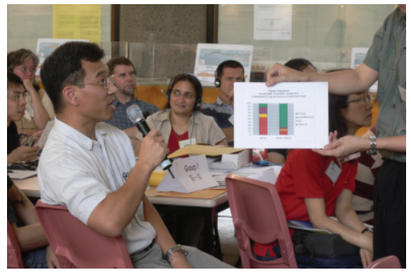
3.3.1. Nearly all groups suggested the creation of a vibrant and continuous waterfront with sufficient greenery for public enjoyment and tourism promotion. Multi-purpose and diversified functions and activities, with respect to culture, water sports and leisure should be provided along the waterfront. Waterfront enhancement should also target the improvement of environmental quality. The current cultural heritage and natural resources, including Causeway Bay Typhoon Shelter, should be conserved and enhanced. A unique identity for the waterfront would be desirable.

3.3.2. Many groups proposed that the current incompatible uses, such as Government storage areas and pump houses should be removed. In order to further beautify the waterfront, some propose that space below the existing Island Eastern Corridor should be revitalized to accommodate some special design features and leisure activities.

3.3.3. Most groups agreed that if there is no alternative and there is an overwhelming case for the construction of the CWB to solve the traffic congestion problem, they prefer a tunnel form, ideally a submerged tube, as it allows more flexible use of the waterfront and causes least adverse visual impacts. Among the 13 concept plans, a total of 10 plans adopt the tunnel option (5 for deep tunnel; 4 for shallow tunnel; 1 for deep and shallow tunnel); 1 for semi-at grade road; 2 without consensus on the form of CWB. Based on the above three proposed trunk road concepts, the major common land use components associated with the deep tunnel, shallow tunnel and semi-at-grade road are presented in Section 3.3.

Urban Design Principles

3.3.4. Many groups considered that the waterfront enhancement should embrace the sustainable development concept. To create a vibrant waterfront, focal nodes with points of interest should be added along the waterfront, which should be widened adequately for cultural and leisure activities. More greenery elements should be included in the waterfront to enhance its visual quality. No large-scale building projects, which would block the ridgeline should be allowed. Landmarks should be planned to enhance a sense of identity along the waterfront.



3.3.5. Many pointed out that the pedestrian linkage from the hinterland activity nodes to the waterfront should be strengthened to bring more people to the waterfront. Some therefore recommended extending Victoria Park to the waterfront through the provision of a landscaped deck. To further enhance the environmental quality of the waterfront, many supported the creation of a traffic free environment along the waterfront and the separation of traffic from pedestrians.

3.3.6. Many groups realized that if building the trunk road proves to be the most practicable solution in the traffic problem, some reclamation may be necessary. However, all agreed that minimum reclamation should be an over-riding principle in the design of transport infrastructure facility.

3.4 BROAD CONCEPT PLANS PREPARED BY THE PARTICIPANTS

3.4.1. No matter there was any group consensus on the transport infrastructure issue or not, and irrespective of the form of the CWB to be adopted, there are apparently many common land use concepts for the harbourfront to enhance its vibrancy and attractiveness. These are mainly reflected in the proposed activity nodes and their disposition.

Cultural Node

3.4.2. Taking advantage of the proximity to the HKCEC, Hong Kong Arts Centre, and Hong Kong Academy for Performing Arts, any available land around HKCEC should be planned for additional cultural, leisure and supporting activities, such as performing arts venues, floating stage, open air informal performing spaces, museums, flea market, fun fair, exhibition area as well as underground shopping center and car park. Some groups proposed to locate a helipad at the north-eastern pier area of HKCEC to promote tourism.

Sports/Water Activity/Entertainment Node

3.4.3. Two main sports/water activity/entertainment nodes were proposed in Kellet Basin (ex-Public Cargo Working Area) and Causeway Bay Typhoon Shelter. The first node offered space for water sports such as sailing and yachting activities. The land area around the basin would be best for promenade with outdoor cafés, alfresco dining outlets.

3.4.4. The second node at Causeway Bay would have larger spaces for rafting, dragon boat rowing and water taxi/junk boat operations. The breakwater could be utilized for fishing and as a promenade if the top could be flattened to achieve a greater width. Depending on the form of CWB adopted, there would be different land

availability. For the shallow tunnel concept, there would be some reclamation within the typhoon shelter which would allow a wider and continuous promenade along the existing waterfront. In the deep tunnel concept, the typhoon shelter would likely be retained in its existing state, including its narrow promenade along Victoria Park Road. In this case some groups proposed to provide links between the breakwaters to increase promenade provisions.

3.4.5. Nearly all the groups proposed to promote at the typhoon shelter seafood on sampans, fishermen's wharf, Dai Pai Dong, Lan Kwai Fong on water, sight-seeing boat trips, etc.

Heritage Node

3.4.6. Many groups also proposed a heritage node at the typhoon shelter and adjoining areas as there were the typhoon shelter itself, the Royal Hong Kong Yacht Club, the floating Tin Hau Temple, and the Noon Day Gun. It was also suggested that a fishermen's museum be built to commemorate the history of Hong Kong as a fishing community. A-King boatyard was considered a suitable site for such a museum.

Green Leisure Zone

3.4.7. Most of the participants would like to see more green space for leisure activities. Simple lawns and areas with trees were most welcome. Two such zones were identified, one to the west of Kellet Basin and the other one beneath the Island Eastern Corridor. The latter one is only possible in the deep tunnel concept for the CWB. Activities like fishing, fun fair, walking dogs, skating were envisaged in this zone in addition to passive recreation. It would enhance the living quality of the residents who had been under the environmental impacts of the IEC. However, even in the shallow tunnel concept in which no reclamation was envisaged beneath the IEC, the participants would still like to see boardwalk/ floating bridge, arts and design features, namely landscaped dolphins beneath the corridor to liven up the space.

Pedestrian Linkages

3.4.8. All groups urged for strengthening of pedestrian linkages between the waterfront and the hinterland, through Tonnochy Road, Marsh Road, Watson Road, etc. Existing footbridges should be upgraded and more footbridges should be provided. Many groups would like to see an extension of Victoria Park to the waterfront by a new landscape deck. A few groups suggested to build an underground car park and shopping mall beneath Victoria Park.

3.4.9. In the land use concept plans with a semi-at-grade CWB, landscape promenade above the road was proposed which allowed the public to get close to the harbour. If it was not possible to achieve a continuous deck, landscape decks at suitable locations would also be considered acceptable. Some kiosks would be welcome on the deck.

3.4.10. Figures 3.2, 3.3 and 3.4 summarize the common land use concepts in the context of different forms of the CWB, viz, shallow tunnel, deep tunnel and semi-at-grade road.

圖 3.2 中環灣仔繞道(淺層隧道)的活動區

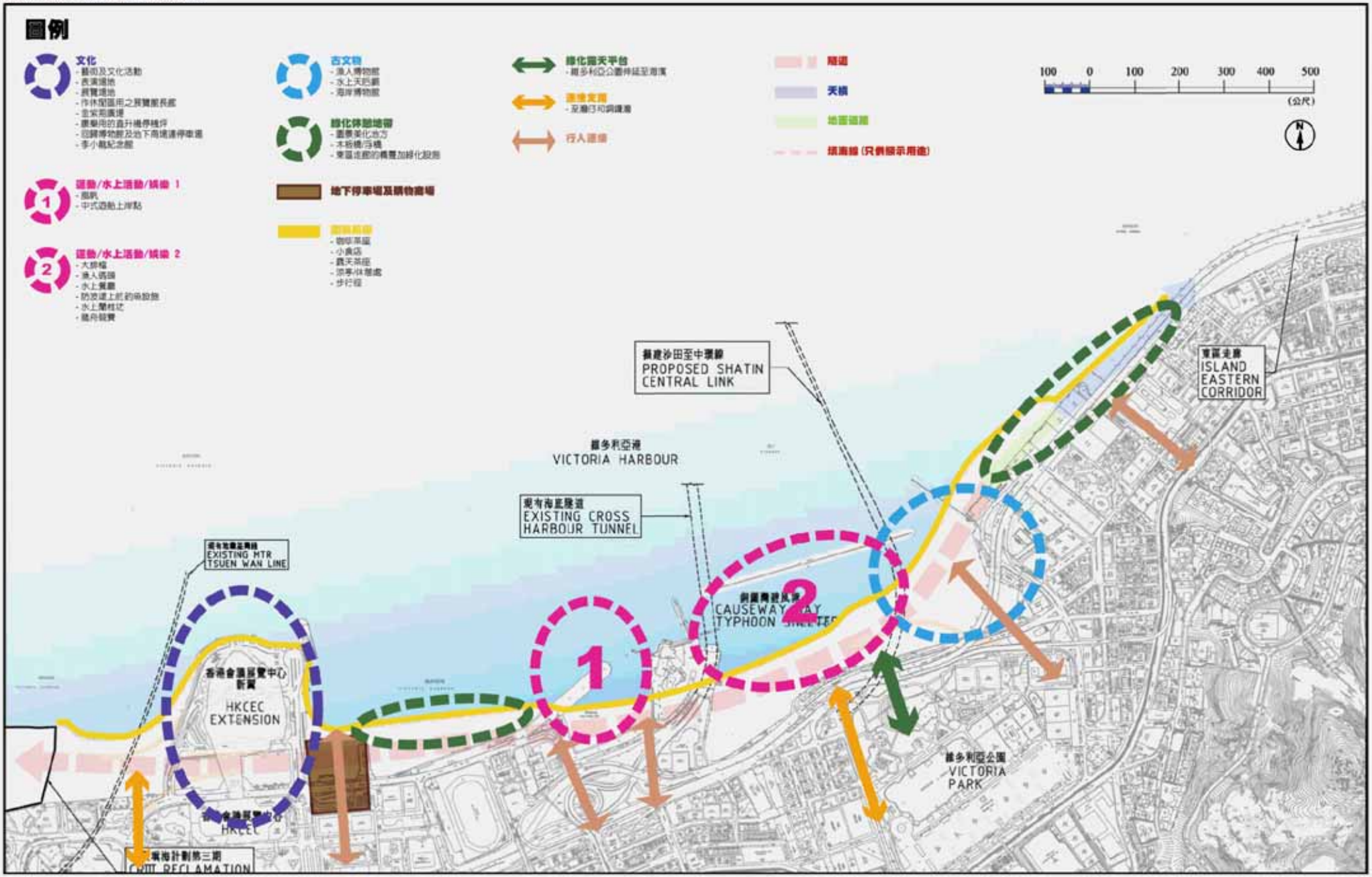
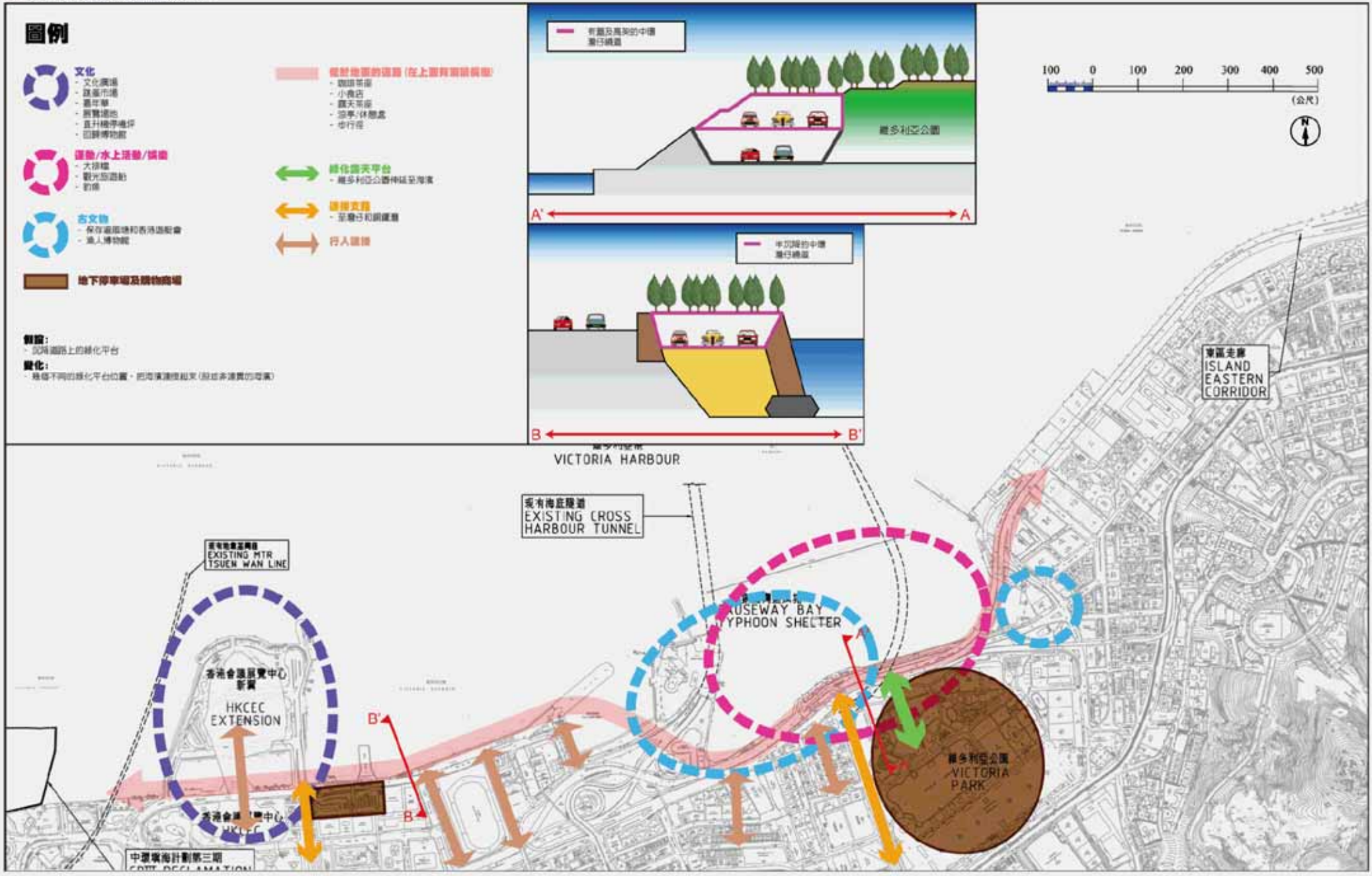


圖 3.3 中環灣仔繞道(深層隧道)的活動區

圖 3.4 中環灣仔繞道(半路面道路)的活動區



CHAPTER 4 **OPINION SURVEYS**

4.1 INTRODUCTION

4.1.1. Opinion surveys had been designed to solicit views from the public who might not be immediately affected by the WDII Study. To collect views from different target groups to ensure a wider coverage of the public, three sets of survey questionnaires had been designed as follows:

Telephone Survey

4.1.2. To ensure a wide coverage of respondents over the territory, a concise questionnaire for telephone survey was drawn up to deal with critical concerns. The telephone survey was conducted from 30 May to 13 June 2005 and were targeted at respondents aged 15 and above, who were selected randomly.

4.1.3. A total of 921 successful interviews with at least 300 from each broad district of Hong Kong Island (311 nos.), Kowloon (307 nos.) and the New Territories (303 nos.) were carried out.

Road-side Survey

4.1.4. In order to collect the views of the local people who may be more directly affected by the WDII project area, a road-side survey was conducted so as to have a better understanding of the aspirations of the local people. A set of questionnaires was designed, modified and agreed after a pilot survey. The interviews were also targeted at people aged 15 and above and include both pedestrians and drivers.

4.1.5. A total of 161 interviews were completed during 21 May to 28 May 2005, on both weekdays and weekends, at different locations in Central, Wan Chai and Causeway Bay areas.

Self-administered Survey

4.1.6. In order to further facilitate public engagement, another set of questionnaire was prepared and attached at the PEK and distributed during forums and charrettes. Moreover, the questionnaire was uploaded to online to gather views from the wider general public.

4.1.7. These questionnaires are largely the same as that used in road-side survey, except that they are self-administered and are also open to younger children of under 15. Besides, since this form of survey is self-administered, there is no information to confirm if one person has actually submitted several questionnaires. Nevertheless, such form of engagement is useful in raising public awareness and discussion.

4.1.8. A total of 306 completed questionnaires were collected during the Stage 1 public engagement period. Of these, 231 were received on-line and 75 questionnaires were collected through mail, fax, email or at various public engagement events.

4.1.9. An overall analysis of the abovementioned surveys, based on key discussion topics is presented in the following section. A comparison of the results of the three types of surveys has been undertaken, highlighting their major similarities and differences. Detailed analysis of each survey type with figures is provided in the Annex Volume.

4.2 OVERALL ANALYSIS

1) Knowledge on "Protection of the Harbour Ordinance" and "Judgment of Court of Final Appeal"

4.2.1. Although the issue of reclamation in Victoria Harbour has become a public agenda, it is noted that only about 35% of the general public in the territory consider themselves being aware of the "Protection of the Harbour Ordinance" and "Judgment of Court of Final Appeal". This percentage increases to 50% in the Wan Chai, Causeway Bay and Adjoining Areas, and further increases to 79% when the survey was completed on-line or self-administered.

4.2.2. This shows that people who live in areas away from the Harbour are less concerned about the issue on reclamation, while those who proactively completed the questionnaires were rather concerned and have more knowledge on the issue.

4.2.3. Nevertheless, it should be noted that a significant percentage of people are unable to point out the major feature/principle of the Ordinance or have some misconception on the Ordinance. Therefore, it is considered that more education of the general public on this aspect is required.

2) Attractions and Problems of Wan Chai, Causeway Bay and Adjoining Areas

4.2.4. People who were interviewed at around Wan Chai are more attracted by its proximity of "convenient shopping and cheap commodities", "easy accessibility by transport", "variety of eating places and entertainment". On the contrary, the self-administered questionnaire findings reveal that more respondents are attracted by the "mixture of old and new culture", "old character streetscape" as well as "many eating places", "easy accessibility by transport" and "variety of entertainment". Overall, there is consensus that traffic congestion, air pollution and noise pollution are the three most significant issues of the area.

3) Wishes for the New Harbour-front and its Future Roles

4.2.5. As revealed from both the road-side survey and self-administered survey, "beautiful landscaping and high visual quality" and "improvement in traffic congestion" are the two top wishes for the new harbour-front.

4.2.6. It is interesting to note that findings from telephone survey covering the whole of Hong Kong, Kowloon and New Territories show that 31% prefer to maintain the status quo, although the next two top wishes are the same as the other counterparts, i.e. on beautiful and high visual quality and removal of traffic congestion. This may be due to the fact that the respondents in the telephone survey are less concerned about the local situation and have little initiative to improve them.

4.2.7. The wishes expressed are also consistent with the intended future roles of the area in various surveys where Visual Role with provision of high quality and landscaped harbour-front environment and Traffic Role with improvement in traffic condition and connectivity are the most preferred future roles of the study area.

4) Principles for Planning for Harbour-front Development

4.2.8. Among the 10 principles, "ensure vibrant and attractive waterfront", "maximize opportunities for public enjoyment", "enhance visual amenity, landscape and quality of space", and "improve traffic condition and pedestrian connectivity" are the most popular across the surveys.

4.2.9. Nevertheless, it is noted that the results of the self-administered questionnaire establishes that "ensure community participation in the planning process" is the second most important principle and this is in line with the proactive nature of completing the self-administered questionnaires done on-line or sent back by respondents.

4.2.10. The telephone survey, on the other hand, shows that "enhance visual amenity, landscape and quality of space", "minimize energy consumption" and "preserve natural and cultural heritage and identity" are very important and this may be attributed to the more "remote" attachment or less opportunity to enjoy the area.

5) Traffic Congestion between Sheung Wan/ Central and Causeway Bay Including Connaught Road Central/Harcourt Road/ Gloucester Road Corridor is a Problem which Needs to be Tackled

4.2.11. Both the telephone and road-side survey reveal that about 75% and 81% of the respective respondents consider that traffic congestion is an issue which needs to be tackled. However, a smaller percentage of 67% consider it a problem which needs to be tackled in the case of the self-administered questionnaires.

4.2.12. Overall, about 5-7% of respondents do not think this to be an issue, whilst 3.2% (telephone survey), 5% (road-side survey) and 21% (self-administered survey) of respondents recognize it is an issue but do not think it has to be tackled at the present time.

6) Measures to Tackle the Congestion Problem

4.2.13. "Trunk road and other traffic management measures" are considered by most respondents across the surveys as preferred measures to tackle the problem. "Traffic management measures only" ranks second and "trunk road only" ranks third.

7) Form of Trunk Road

4.2.14. With regard to the form of the trunk road, it is interesting to note that majority of respondents (about 46%) from road-side and self-administered survey prefer tunnel whereas respondents of telephone survey have higher preference for flyover probably because they can enjoy the beautiful scenery of the harbour as they drive or travel along the flyover.

4.2.15. Among those who have chosen tunnel, most of them support entrance/exit at Wan Chai and Causeway Bay.

4.2.16. It is noted that there are people who would rather tolerate traffic congestion than to build a trunk road which involves reclamation. This ranges from 9% of the road-side respondents and 28% of the self-administered respondents who show such preference.

8) Reclamation for a Continuous Promenade

4.2.17. Although there is a general wish for a continuous promenade from Sheung Wan/Central to Causeway Bay, the majority of the respondents do not favour reclamation in order to provide a continuous promenade.

9) Profile of the Respondents

4.2.18. It is noted that the age group of the respondents in all three surveys are relatively similar. More respondents of road-side survey tend to receive higher education in Wan Chai, Causeway Bay and adjoining areas than those in the telephone survey with 50% and 28% respectively with tertiary education level. However, respondents of self-administered survey have the highest percentage (85%) of tertiary education.

CHAPTER 5 WRITTEN SUBMMISSIONS

5.1 INTRODUCTION

5.1.1. In each forum and charrette, participants were given a sheet of paper for them to write down their one biggest wish for the Wan Chai and Causeway Bay harbour-front area. A total of 123 returns were obtained. Other forms of written submissions were received through fax/ email/ post and in questionnaires. There are four submissions with more detailed proposals with plans and illustrations, made by Mr. Sam Lam, the Royal Hong Kong Yacht Club (RHKYC), Swire Group (Swire), and the Hong Kong Regional Heliport Working Group (RHWG).

5.1.2. Many of the biggest wishes and written comments/ proposals share similar views expressed in the forums and charrettes. Therefore, only the major additional comments under similar headings as in Chapter 2 are reported here for easy reference. Details of the submissions are compiled in the Annex Volume.

5.2 HARBOUR-FRONT ENHANCEMENT

Vibrancy

5.2.1. People stress on diversity of usage (cultural exchange, heritage and history, entertainment, food & beverage, relaxation, pet lovers, enjoyment of natural beauty, community integration, etc.).

5.2.2. RHKYC proposes a lot of water sports and tourism activities including:

- sailing training centers, moorings for historical ships with tourism value, aquatic displays and entertainment at the Kellet Basin (ex-Public Cargo Handling Area)
- re-organize moorings within typhoon shelter to make way for a dragon boat race course along the waterfront
- public landing areas for leisure crafts along the breakwater
- moorings for large visiting yachts along the new seawall to the east of HKCEC
- multiple use facilities for performance and public gathering
- on shore service facilities for boating activities
- water taxi/ferry pontoons

5.2.3. Swire proposes an informal waterfront along the study area as compared with a formal waterfront along Central waterfront with extension of Victoria Park to the waterfront, urban beach, amphitheatre along the typhoon shelter, and water sports and restaurants/dining quay at and multi-purpose pier at Kellet Basin.

5.2.4. Mr. Sam Lam's 'Harbour Dream' shares many similar land use elements as suggested at the public charrettes and written submissions, some more unique features are highlighted below:

- illuminated fountains along the shore of Lung King Road and Convention Avenue
- depress Lung Wui Road, Fenwick Pier Street and Convention Avenue for providing more pedestrian areas above
- underground bus and coach terminal Expo Drive East with a performances venue on top
- heliport on offshore island to the West of HKCEC
- cultural square at existing bus terminus site north of Great Eagle Centre
- car park underneath Victoria Park

5.2.5. RHWG proposes a domestic and cross boundary heliport at the north-western tip of the HKCEC to serve both business and tourism sectors. The proposal also includes upgrading the existing ferry terminal building for exhibition, restaurant, and helicopter service uses, as well as revamping the existing Star Ferry Pier for museum use.

Connectivity/Accessibility

5.2.6. Many would like to see a sky train/ tram/ people mover along the promenade. Public access through the Yacht Club or above the cross harbour tunnel portal, and boardwalks beneath IEC are proposed to achieve a continuous promenade. Water transport is also stressed. Both Swire and RHKYC champion a landscape deck from Victoria Park to the waterfront over roads to improve accessibility.

Land/Marine Use Compatibility

5.2.7. Quite a few people support removal of incompatible uses along the waterfront such as the sewerage plant, waste collection point, cargo handing areas, etc., and the provision of more facilities for water sports and water transport. Width of promenade could vary with a general width of 25m proposed. Some opine that only very limited advertisements should be permitted along waterfront.

Cultural/Historical Heritage

5.2.8. Some urge the provision of exhibition areas for the history of harbour reclamation, return of sovereignty to China, helicopter and seaplane transport and Star Ferry operation in Hong Kong. Others propose to conserve the remaining natural coastline at Kellet Island.

Environmental Quality

5.2.9. RHWG recognizing the public's concern on noise pollution from the heliport operations emphasizes its great distance from residential uses and proposes noise barriers along the waterfront.

5.2.10. Some propose to rehabilitate the harbour for ecological diversity including the creation of an urban beach to generate attractions for the public, as well as tourists.

5.3 TRANSPORT CASE

5.3.1. There are many similar proposals for improving general traffic conditions and pedestrian connectivity as raised in the forums/charrettes, stressing on the need for exhausting all other alternatives before building new road infrastructure. Some comments support the building of CWB in tunnel form and implementing ERP together.

5.3.2. Swire has made specific proposals for the strategic road network. The main features are the realignment of existing Victoria Park Road underneath the Victoria Park, allowing the alignment of the CWB to be closer to the existing shoreline. Swire submits that this will minimize reclamation and allow more water surface above the CWB within the typhoon shelter area. The existing elevated section of IEC to the west of A-King Boatyard site is proposed to be submerged to achieve an open view of the proposed urban beach.

5.3.3. RHKYC proposes yet another set of road alignments. Victoria Park Road will be kept in the existing location but the elevated section joining the IEC will be lowered into a tunnel to the west of A-King Boatyard site (similar to the Swire's proposal). As for the Causeway Bay, the sections within the Kellet Basin and the typhoon shelter are proposed to be submerged with water above. In this case, no slip road connections with Causeway Bay are proposed.

CHAPTER 6 EXPERT PANEL FORUM ON SUSTAINABLE TRANSPORT PLANNING AND CENTRAL – WAN CHAI BYPASS

6.1 INTRODUCTION

6.1.1. In the public forums and design charrettes, while there were many common views on ways to enhance the harbour-front, the public expressed diverse views on the transport issues. The Sub-committee decided that an in-depth discussion on the transport issues was necessary before embarking on the next stage of the HER project. In this respect, an "Expert Panel Forum on Sustainable Transport Planning and Central – Wan Chai Bypass" ("Expert Panel Forum") which aimed at reviewing and making recommendations on the sustainable transport planning for the northern shore of the Hong Kong Island, including the necessity of CWB was held on 3 September 2005.

6.1.2. The Expert Panel consisted of local and overseas experts were nominated by the Task Force on HER, Chartered Institute of Logistics and Transport in Hong Kong, Hong Kong Institute of Engineers, Hong Kong Institute of Planners, Department of Civil and Structural Engineering of the Hong Kong Polytechnic University, Department of Civil Engineering of the Hong Kong University of Science and Technology, and Department of Civil Engineering of the University of Hong Kong. The Panel Experts worked on a voluntary basis and they were:

- Professor William H.K. Lam (Chairman), Chair Professor in Civil and Transportation Engineering of the Department of Civil and Structural Engineering, The Hong Kong Polytechnic University
- Prof Michael Bell, Chair Professor in Transport Operations of the Department of Civil and Environmental Engineering, Imperial College London
- Dr Timothy D Hau, Associate Professor of the School of Economics and Finance, The University of Hong Kong
- Dr Hung Wing-tat, Associate Professor of the Department of Civil and Structural Engineering, The Hong Kong Polytechnic University
- Ir Wilfred Lau, Director of Ove Arup & Partners Hong Kong Ltd
- Prof Lo Hong-kam, Associate Professor of the Department of Civil Engineering, The Hong Kong University of Science and Technology
- Ms Y. Y. Pong, Vice President of Hong Kong Institute of Planners
- Dr James Wang, Associate Professor of the Department of Geography, The University of Hong Kong
- Dr S. C. Wong, Associate Professor of the Department of Civil Engineering, The University of Hong Kong

6.1.3. To encourage interflow of views and ideas, the Expert Panel Forum was open to the public and opportunities were provided for stakeholders and interested parties to make written submissions to the Forum. Nineteen submissions were received from different organizations and members of the public prior to the Forum. Transport Department also made a detailed submission. Views and arguments expressed on the transport issues were similar to those received in the public forums and charrettes.

6.1.4. The Expert Panel Forum began with explanations of Government's transport case by the Government officials, followed by presentation of a summary of public submissions, and initial responses from the Government officials. A floor discussion session was subsequently held to provide a dialogue between the general public and the Panel.

6.1.5. An Expert Panel report had been prepared making recommendations on sustainable transport planning for the northern shore of the Hong Kong Island, taking account of the views from the Government as well as the public.

6.1.6. The Report of the Expert Panel on Sustainable Transport Planning and Central – Wan Chai Bypass has been uploaded onto the HEC website for detailed reference.

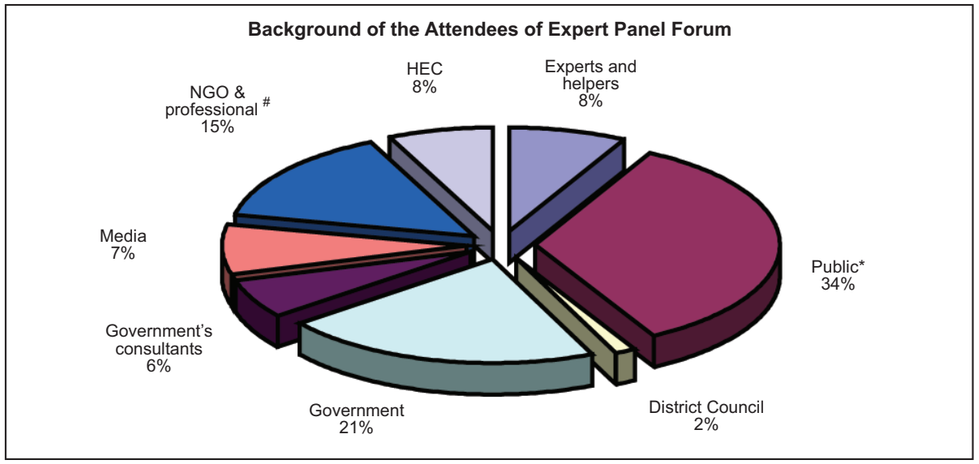
Website Link:
http://www.harbourfront.org.hk/eng/content_page/doc/report_of_the_expert_panel.pdf.

6.2 CROSS SECTION OF PARTICIPANTS

6.2.1. The Expert Panel Forum was well attended by 129 participants with different backgrounds, including the Panel Experts and helpers, the general public, representatives of Non-government Organizations ("NGO") and professional groups, HEC members, District Council members, Government officials, Government's consultants, working team and media.

Figure 6.1 Background of the Attendees of the Expert Panel Forum

HEC	Public*	District Council	Government	Government's consultants	Experts and helpers	NGO & professional #	Media	Total
10	44	2	27	8	10	19	9	129



*Public includes citizens, teachers, students and other consultant and commercial firms.

NGO and professional groups includes St James' Settlement, Hong Kong Democratic Foundation, Hong Kong People's Council for Sustainable Development, Society for Protection of the Harbour Ltd., Hong Kong Regional Helipad Working Group, The Chartered Institute of Water and Environmental Management Hong Kong, Hong Kong Trade Development Council, Society for the Prevention of Cruelty to Animals, Clear The Air, Civic Exchange, Save Our Shorelines, Airport Authority, Hong Kong, Hong Kong Marine Conservation Society, Citizen Envisioning @ Harbour, and Hong Kong Institute of Architects

6.3 KEY QUESTIONS TO BE ANSWERED

6.3.1. In the Expert Panel Forum, six key questions were discussed and the responses from the Expert Panel are summarized as follows:

(1) *Is doing nothing sustainable?* "No". Based on the analysis of the government, the Panel agreed that the existing road network would not be able to cope with travel demand a decade from now even assuming no growth in vehicle number and no further land development in the Central and Wan Chai area.

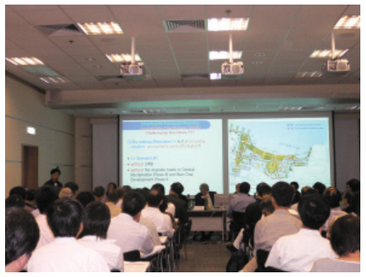
(2) *Is the provision of the Central - Wan Chai Bypass alone sustainable?* "No". Since the Bypass has a finite capacity, growth of travel demand over a decade would overrun its capacity.

(3) *Can implementing road pricing per se solve the problem at hand?* "No". No measure alone can serve as a panacea and it may not be socially acceptable.

(4) *Is CWB and accessibility to the waterfront mutually exclusive?* "No". Harbour-front enhancement to facilitate access to the waterfront and the enjoyment thereof by the public should be made a priority in the development of the Bypass.

(5) *Is stopping development an acceptable and sustainable solution to road congestion?* "No". Sustainability calls for a proper balancing of economic, social and environmental considerations. This balance could not be achieved by halting development.

(6) *Are the Bypass and electronic road pricing mutually exclusive?* "No". Long-term sustainability warrants the implementation of both electronic road pricing and the construction of the CWB.



6.4 RECOMMENDATIONS

6.4.1. The Expert Panel in their report provided the short-, medium- and long-term recommendations for the sustainable transport planning of the Central and Wan Chai area.

6.4.2. Short-Term Measures

(1) Transportation Management Measures

Measures include loading/unloading restrictions, junction improvement, public transport route rationalization, etc..

(2) Tunnel Toll Adjustment

The Panel recommends that the Government should revamp the tolling arrangements of the three tunnels traversing the Victoria Harbour as a mitigating measure prior to the opening of the CWB.

(3) Managing Development Programme

The Panel recommends that the Government should address the need to regulate land-use developments throughout the Corridor area in order not to aggravate the congestion problem in the Corridor before the Bypass opens.

(4) Pedestrian Access to the Waterfront

Facilities for improvement of pedestrian access to the waterfront should also be provided in the interim.

6.4.3. Medium-Term Measures

(1) Enhancing the Multi-modal Transport Network

Since the existing transport infrastructure facilities could not meet current and future vehicular demand by 2016, the Panel members support the construction of the CWB to improve the reliability of the road network and to make use of the opportunities for enhancing multi-modal public transportation in the Corridor. They also support the provision of slip roads at the Hong Kong Convention and Exhibition Centre area and at the Victoria Park Road/ Gloucester Road/ Hing Fat Street passageway to magnify the benefits of the CWB.

(2) Environmental and Social Concerns

The Panel recommends that the Government should properly address the visual and environmental impacts and social concerns arising from the construction of the CWB.

(3) Road P2

The Panel recognizes the need for Road P2 as an important *ad interim* measure in addressing traffic congestion in the Central reclamation area before the Bypass comes about. The Panel suggests that the Government also review the scale of P2 to match the gradual land development programme. While it may be necessary to reserve sufficient land for the full-scale development of Road P2 over the longer term, the Government should explore introducing pro tempore traffic calming measures on Road P2 and greening the reserve area in the meantime.

(4) Road Pricing

The Panel recognizes the importance of road pricing as a sustainable transport measure. The Panel also recommends that the Government should undertake a detailed assessment of the viability of alternative pricing schemes (electronic or otherwise), their relative effectiveness and social acceptability.





(5) The Complementariness of Road Pricing and the Bypass

The Panel recognizes that road pricing is a complementary measure to the construction of the CWB. The Panel also recognizes a window of opportunity exists to introduce ERP at the opening of the CWB. Integrating ERP with road capacity enhancement thereby constitutes a package of measures that is more likely to be publicly acceptable and truly sustainable over the long term.

6.4.4. Long-Term Measures

(1) Holistic Approach towards Transport/Land Use Planning

The Panel recognizes that the Government has been taking an interactive approach towards land use and transport planning, and further recommends that the Government should further fortify this integration, placing due emphasis on the limitation of excessive transport infrastructural development in heavily congested areas.

(2) An Area-wide Pedestrian Network to the Harbour-front

An area-wide pedestrian network linking the waterfront with the hinterland as well as to all means of transport modes should be developed, thereby connecting motorized and non-motorized transportation in a holistic way.

(3) Incident Management Capability

The Panel recommends that the Government should strengthen the management of traffic incidents along the Corridor to augment the reliability of the expanded road network.

(4) The Maintenance of Reserve Capacities

The Panel recommends that the Government review reserve capacities in the transport infrastructure to better the safety margin. It should be taken as a signal for stemming land use development.

(5) Sustainable Transportation

The Panel recommends that the Government should review and adopt best practices in sustainable transportation for Hong Kong. The Government should also develop integrated policies, strategies and packages for sustainable transportation in Hong Kong for both motorized and non-motorized transportation.

CHAPTER 7 CONSOLIDATION FORUM

7.1 INTRODUCTION

7.1.1. Before the government proceeds with the preparation of the Concept Plans for the development and enhancement of the harbour-front of Wan Chai, Causeway Bay and the adjoining areas, it was considered useful if the public could also be involved in the process of screening and consolidating the comments, ideas and proposals received during the Envisioning Stage. A consolidation forum was therefore suggested.

7.1.2. The objectives of the consolidation forum are as follows -

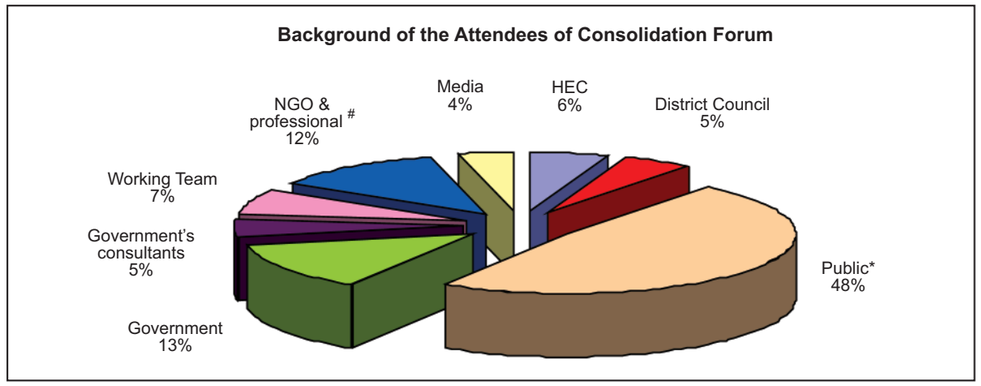
(a) To report to the public the major findings of the Envisioning Stage.
(b) To explain to the public the technical problems and other considerations of those proposals which may not be suitable for being carried forward in the Concept Plans.
(c) To outline the framework for the Concept Plans to be prepared for further public engagement at the Realization Stage.
(d) To gauge the views of the public on the format of the Realization Stage.

7.2 CROSS SECTION OF PARTICIPANTS

7.2.1. It was held on 12 November 2005 and 132 people participated

Figure 7.1 Background of the Attendees of the Consolidation Forum

HEC	District Council	Public*	Government	Government's consultants	Working Team	NGO & professional #	Media	Total
8	7	63	17	7	9	16	5	132



* Public includes citizens and representatives from other consultant and commercial firms.

NGO includes Clean the Air, HK Regional Heliport Working Group, Servicemens' Guides Association, The Association of Engineering Professionals in Society, Council for Sustainable Development, The Chinese Chamber of Commerce, Causeway Bay Typhoon Shelter Mutual-Aid Committee and The Chartered Institution of Water & Environmental Management Hong Kong.

7.3 KEY DISCUSSIONS

7.3.1. Maunsell Consultants Asia Ltd. (MCAL), government's engineering consultants for the WDII Review, after preliminary studies of the proposals submitted by the public, proposed not to take forward some of the proposals in the future concept plan generation that were considered contradictory to the Harbour Planning Principles and Sustainability Principles discussed in Chapter 2:

- Deep tunnel to North Point – significant reclamation and high costs.
- Ground-level road concept – significant reclamation but little land available for enhancing harbour-front.
- Flyover concept (along the existing coastline) – visually intrusive and adverse impact on water recreation at Kellet Basin.
- Flyover concept (along the breakwater) – visually intrusive and adverse impact on usage of typhoon shelter.
- CWB to be provided on existing land - conflict with the existing Wan Chai Electric Substation, Wan Chai Sewerage Plant, basement and structures of buildings along Gloucester Road, i.e. Hong Kong Convention and Exhibition Centre, Great Eagle Centre, Sun Hung Kei Centre, the proposed North Island Line and the proposed Shatin-Central Link, structure of the highway system around the entrance of the existing Cross Harbour Tunnel.
- Berthing facilities along Wan Chai waterfront for visiting vessels – even floating piers may be defined as reclamation, and may be subject to strong winds and waves without new breakwater.
- Openable footbridge link to the breakwater – feasibility of enhancing the existing breakwater for public use has to be established before an openable footbridge can be justified.
- Urban beach at Causeway Bay Typhoon Shelter – the public's aspiration to get in touch with water is appreciated, but water quality is not suitable for regular primary- contact water-based activities even after HATS Stage 2 and odour problem may persist due to poor circulation.

7.3.2. MCAL further recommended a framework for the Concept Plans to be prepared:

- Adopt basically a shallow tunnel form for CWB with variations for different Concept Plans.
- Enhance the new waterfront along Wan Chai after the construction of the CWB with activity nodes as suggested by the public.
- Develop the previous Cargo Handling area into a lively harbour-front area.
- Extend Victoria Park to the waterfront.
- Retain the existing Causeway Bay Typhoon Shelter.
- Improve the water quality at Causeway Bay Typhoon Shelter by suitable but minimal reclamation.
- Adjust the width of the CWB to accommodate the required lanes, road buffer area and structure wall, etc. The design should fulfill the road safety requirements within the tunnel.
- The CWB alignment should avoid the existing Cross Harbour Tunnel alignment and sufficient visual distance should be provided at road bends.
- Add a westbound Victoria Park Road as the slip road to the CWB to relieve traffic from the Causeway Bay area.
- Adjust the curvature and height of the existing Causeway Bay and Gloucester Road footbridges.
- Connect the CWB to Island Eastern Corridor.




7.3.3. Participants expressed their views as follows:

Waterfront Enhancement

- Some participants urged the government to implement interim enhancement measures.
- Some people opined that the openable bridge linking the breakwater should be carried forward and better use of the breakwater should be explored.
- Even if swimming is not allowed, the urban beach concept should not be dropped. It could be a landmark in the city centre.
- Some people objected to heliport at the waterfront and would only tolerate emergency services for environmental reasons.
- A representative of Hong Kong Regional Heliport Working Group championed their latest proposal which involves no reclamation and a new building providing noise mitigation as well as area for public enjoyment.
- Some show support to the restructuring of the IEC for waterfront enhancement near Victoria Park.

Transport Solutions

- While most people agreed to a tunnel option, a few expressed that the flyover option should not be dropped yet as a good architectural design may bring about visual amenity and flyover is much cheaper in construction and maintenance costs.
- Many expressed their support to the Transport Expert Panel's recommendations to have integrated land use/transport planning and to implement the CWB together with traffic management measures including ERP.
- Many were worried that the slip road at Causeway Bay would bring more congestion to the district. MCAL and the government officials confirmed that the slip road indeed exits from Causeway Bay diverting traffic away from the district.
- Some discussion was made on the design of a tunnel and whether an S-curve in a tunnel was desirable or not. MCAL and the government officials confirmed that safety was one of the most important design criteria for a tunnel and S-curve was not desirable from road safety point of view.

7.3.4. After presenting the recommendations for the way forward, the floor commented that it would not be easy for the public to evaluate the Concept Plans with the complicated matrix of indicators. The consultant team would take note of the presentation format and would devise methods to facilitate evaluation by the public in the Realization Stage.

7.3.5. MCAL's presentation materials were uploaded onto HEC's website right after the Consolidation Forum for public comments for two weeks. Seven written submissions were received and details are in the Annex Volume. The following are the major views expressed:

(1) there should be a holistic and integrated planning framework

(2) the concept plans should aim at creating long-term public value rather than going for short-term, least cost options

(3) the harbour is a natural heritage and should be cleaned up rather than filled up to remove pollution

(4) Government should reduce incompatible waterfront uses at the same time

(5) extend Victoria Park to the waterfront

(6) support retaining the following ideas in Concept Plan
  - pedestrian connection to breakwater (increase utility value of breakwater by introducing fishing docks, etc.)
  - artificial beach (not necessarily for swimming)
  - floating pontoons (could be temporary facilities)
  - dragon boat race course within typhoon shelter

(7) suggest the following for the CWB:

  - should be in tunnel form with minimum reclamation
  - minimize slip roads to Causeway Bay and Wan Chai





CHAPTER 8 PARALLEL DISCUSSIONS

8.1 INTRODUCTION

8.1.1. Apart from collecting suggestions and opinions from the stakeholders and the public in forums, charrettes and written submissions, a number of discussions with District Councils, HEC Sub-committee, Town Planning Board and Legislative Council were held in parallel. They include the following discussions (Table 6.1) and the main points are summarized in the subsequent sections:-

Table 8.1 Parallel Discussions during the Envisioning Stage

Meeting Date	Discussions
	District Councils ("DC")
18 January 2005	- Wan Chai District
14 April 2005	- Eastern District
21 April 2005	- Southern District
19 May 2005	- Central and Western District
8 April 2005	**Town Planning Board**
	Legislative Council **Panel on Planning, Lands and Works**
26 April 2005	Item V: Wan Chai Development Phase II Review – Harbour-front Enhancement Review – Wan Chai and Adjoining Areas: A Public Engagement Exercise
28 June 2005	Item IV: Wan Chai Development Phase II Review and South East Kowloon Development (refer to section concerning HER project only)
	Harbour-front Enhancement Committee ("HEC") **Sub-committee on Wan Chai Development Phase II Review**
21 July 2005	Discussion on Proposed Extension of the Atrium Link at Hong Kong Convention and Exhibition Centre ("HKCEC") (presentation by Hong Kong Trade Development Council ("TDC")
9 August 2005	Discussion on the Proposed Development of a Government Helipad at the Hong Kong Convention and Exhibition Centre (presentation by Economic Development and Labour Bureau, Security Bureau, Civil Aviation Department and Government Flying Service) Discussion on the Proposed Regional Hong Kong Heliport (presentation by Hong Kong Regional Heliport Working Group)

8.2 DISTRICT COUNCILS

8.2.1. Consultations with the four concerned District Councils, namely Wan Chai District, Eastern District, Southern District and Central and Western District on the public engagement exercise of the HER project were held between January and May 2005. The DC members were all in support of the public engagement process. They also made suggestions on further refinement of the draft public engagement kit and the improvement of the engagement process. These suggestions have been taken into account in finalizing the public engagement kit and the conduction of forums and charrettes. Details of the meeting minutes have been uploaded onto the respective websites of District Councils.

Website Links:
http://www.districtcouncils.gov.hk/wc/english/welcome.htm
http://www.districtcouncils.gov.hk/east/english/welcome.htm
http://www.districtcouncils.gov.hk/south/english/welcome.htm
http://www.districtcouncils.gov.hk/central/english/welcome.htm

8.3 TOWN PLANNING BOARD

8.3.1. Details of the public engagement process of the Envisioning Stage of the HER project were presented to Town Planning Board at its meeting on 8 April 2005. The Town Planning Board members show support to the public engagement process. Regarding the draft public consultation digest, the Board members provided their suggestions, which were taken into account in finalizing the public engagement kit.

8.4 LEGISLATIVE COUNCIL--PANEL ON PLANNING, LANDS AND WORKS

8.4.1. Two discussions with members of Legislative Council -- Panel on Planning, Lands and Works concerning the subject HER project were held on 26 April 2005 and 28 June 2005 respectively. The first meeting focused on commenting on the draft public engagement report and the engagement process during the Envisioning Stage, while the second one focused on the progress and concerns of the HER project.

8.4.2. During the first meeting, the LegCo members gave their support to the public engagement process of the Envisioning Stage. Suggestions on further refinement of the draft public engagement report were raised and were taken into account in the preparation of the final report.

8.4.3. In the second meeting, after briefing members on the initial public views collected during the public engagement exercise of the Engagement Stage, the LegCo members expressed diversified views over various topics as shown below:

- Consolidation and analysis of public views involving questionnaires
- Role of public views in making the final planning decision
- Concerns on reclamation related to the construction of CWB
- Considerations of alternatives other than road construction to relieve traffic congestion
- Conduction of another forum inviting experts and academics to debate on the possible transport solutions
- Progress of HER

8.4.4. All these concerns will be taken into account in the generation and evaluation of Concept Plans in the next Realization Stage. Details of the minutes of the above two meetings have been uploaded onto the website of Legislative Council.

Website Links:

http://www.legco.gov.hk/yr04-05/english/panels/plw/minutes/pl050426.pdf
http://www.legco.gov.hk/yr04-05/english/panels/plw/minutes/pl050628.pdf

8.5 HEC--SUB-COMMITTEE ON WAN CHAI DEVELOPMENT PHASE II REVIEW

Proposed Extension of the Atrium Link at HKCEC

8.5.1. A briefing on the proposed Atrium Link extension of HKCEC by TDC was presented to HEC members at its special meeting of Sub-committee of Wan Chai Development Phase II Review on 21 July 2005. In brief, the HEC Sub-committee members did not object to the project, but had a few concerns highlighted in the meeting as follows:

- In view of concerns over the traffic, visual and environmental impacts associated with the project, the conduction of a sustainability impact assessment should be considered.
- The project did not propose any enhancement to the harbour-front.
- Whether TDC could defer their application so that their proposal could be considered comprehensively with the Concept Plans to be prepared for Wan Chai North.
- TDC should confirm whether the effective "decking over" of the harbour by the HKCEC expansion proposal would comply with the Protection of Harbour Ordinance.

8.5.2. The above views were submitted to the Town Planning Board as comments on the HKCEC proposal and would be included in the concept plans to be generated at the Realization Stage. Details of the meeting minutes have been uploaded to the HEC website.

Website Link:
http://www.harbourfront.org.hk/eng/content_page/doc/subcom_3_agenda_7_m.pdf

Proposed development of a Government helipad at the HKCEC and Proposed Regional Hong Kong Heliport

8.5.3. Two briefings were presented to HEC members at its 7th meeting of Sub-committee of Wan Chai Development Phase II Review on 9 August 2005. The first one involved the proposed Government helipad at the HKCEC by Economic Development and Labour Bureau, Security Bureau, Civil Aviation Department and Government Flying Service, while the second one involved the proposed Regional Hong Kong Heliport by Hong Kong Regional Heliport Working Group. The meeting concluded that a helipad, irrespective of whether it would be for government use only or shared use, should be included in the Concept Plans to be produced at the Realization Stage of HER. The meeting also confirmed their agreement to the principle that the helipad should not induce any form of reclamation, irrespective of whether it is in the form of conventional or unconventional reclamation. An HEC member proposed that the option of turning the existing temporary helipad at Kellet Bay into a permanent facility should be explored. Details of the meeting minutes have been uploaded onto the HEC website.

8.5.4. At the 9th HEC Sub-Committee meeting on 12 December 2005, the members agreed that the option of keeping the helipad at Kellet Bay should be dropped as it would adversely affect the public's aspirations to turn Kellet Bay into a water sports and entertainment area.

8.5.5. Details of the meeting minutes are available at HEC website.

Website Link:
http://www.harbourfront.org.hk/eng/content_page/subcom_3_meetings.html?s=1

8.6 PRESENTATION AFTER CONSOLIDATION FORUM

8.6.1. Subsequent to the Consolidation Forum, the consultants on behalf of the Wharf (Holdings) Limited made a presentation of the proposed youth hostel and arts centre cum hotel development at the ex-A-King slipway site at the 9th HEC Sub-Committee meeting on 12 December 2005. Details are available in the meeting minutes.

CHAPTER 9 CONCLUSIONS AND RECOMMENDATIONS

9.1 CONCLUSIONS

9.1.1. In the various public engagement activities in the Envisioning Stage, there is obvious consensus among the public on the need for enhancement of the harbour-front in the following aspects. Indeed, the public urges the Government to take immediate actions wherever possible to enhance the quality and the usage of the existing harbour-front.

(a) Increase vibrancy through provision of facilities for diverse use on land and on the water.
(b) Enhance connectivity between the harbour-front and the hinterland, and continuity of the harbour-front.
(c) Ensure land and marine use compatibility in terms of function and design.
(d) Enhance identity of Hong Kong by conserving natural and cultural heritage.
(e) Harbour is the greatest natural heritage and minimize harbour reclamation is the key.
(f) Enhance visual amenity, landscape and quality of space with emphasis on greening and flexible use of space and less building structures.
(g) Enhance environmental quality with particular attention on the existing water quality in the typhoon shelter and the form of CWB in that more support goes to tunnel form.
(h) Devise an acceptable and sustainable solution for the present traffic and infrastructure issues.

9.1.2. There are many specific suggestions for achieving the above enhancement objectives and a consolidated set of sustainability principles and indicators has been developed through the participation of the public.

9.1.3. There is also majority support for the need to improve the traffic conditions along the Connaught Road/ Gloucester Road Corridor for a comprehensive harbour-front enhancement. The Government has put up a strong case for building the CWB as a fundamental solution with traffic management schemes as complementary measures. There are divided views among the public on the absolute need for the CWB. However, the results of the opinion surveys show a clear majority in favour of constructing the CWB together with traffic management measures. On this issue, HEC and the Government organized a Transport Expert Forum on 3 September 2005 to have an impartial and in-depth deliberation, from which a conclusion based on the majority view of the expert panel has been drawn. The Expert Panel was provided with detailed traffic data and models. No detailed road design information identifying the impact on harbour-front land use and harbour-front enjoyment of the various options was available at this stage.

9.1.4. The expert panel concludes that doing nothing is not sustainable, and the provision of the CWB alone or implementing road pricing alone is not sustainable either. The panel observes that long term sustainability warrants the implementation of both electronic road pricing and the construction of the CWB. To facilitate access to the waterfront and the enjoyment thereof by the public should be made a priority in the development of the CWB. The panel has put forward short-term, medium-term and long-term measures to achieve a sustainable transport strategy. Of particular reference to the current concept planning for the WDII Review, the panel's recommendations include:

(a) Take a holistic approach towards transport/ land use planning and fortify the simultaneous integration of land use and transport planning, placing due emphasis on the limitation of excessive transport infrastructural development in heavily congested areas.
(b) Support the construction of CWB as an essential link in the strategic road network.
(c) Support the construction of slip roads around the HKCEC and Victoria Park Road/Gloucester Road/Hing Fat Street.
(d) Recognize the need for Road P2 as an important *ad interim* measure in addressing traffic congestion in the Central reclamation area before CWB comes about. Suggest Government to review the scale of P2 to match the gradual land development programme. While it may be necessary to reserve sufficient land for the full-scale development of Road P2 over the longer term, the Government should explore introducing pro-tempora tempore traffic calming measures on Road P2 and greening reserve area in the meantime.
(e) Improve pedestrian connections to the harbour-front in the interim and long terms. Enhance the Victoria harbour-front and properly address the visual and environmental impacts and social concerns arising from the construction of the multi-billion dollar Bypass, in addition to improving pedestrian access.
(f) Seize the opportunities to rationalize multi-modal public transport routes and improve connectivity with rail.

9.1.5. The public mostly provided their views and proposals for the waterfront areas between the HKCEC and the IEC. But there were also views expressed for the waterfront areas west of the HKCEC including the CRIII areas. They included the importance of sustainable land use/ transport planning in that a review on the intensity of planned land uses on CRIII and Tamar was called for; a formal waterfront at CRIII as compared with an informal waterfront at WDII; and depressing existing waterfront access roads to enhance pedestrian connectivity to the harbour, etc.

9.2 RECOMMENDATIONS

9.2.1. Based on the public opinions obtained and the transport expert panel report, the Specialist Consultant Team has the following recommendations for the WDII Review.

(a) Fortify the integration of land use and transport planning, placing due emphasis on the limitation of excessive transport infrastructural development in heavily congested areas.

(b) Prepare Land Use Concept Plans based on at least two highway options, viz, tunnel and flyover with minimum reclamation and harbour-front land use possible for each option or option variations. It is not necessary to have a Concept Plan without the CWB. While the public's concern over the visual impact of a flyover option is fully appreciated, it is not recommended to be dropped at this stage until more comprehensive information on the flyover option is provided at the next stage.

(c) With regard to provision of P2, slip roads, tunnel portals and other surface infrastructure, more details should be provided including engineering details, surface land occupied, reclamation required, pedestrian connectivity and visual impact. The traffic impact for the different options based on no slip road should also be covered.

(d) In preparing the Concept Plans, the Government should take full account of the sustainability principles and indicators, and the public's suggestions on the harbour-front enhancement measures, activity nodes and the possible land uses within the nodes as reported in previous sections and summarized in Figures 3.2 to 3.4. If there are technical problems for certain ideas, clear explanations should be provided.

(e) With regard to the heliport proposals, the government's 2-pad proposal, and the Regional Heliport Working Group's 4-pad proposal may be incorporated as inserts for the Concept Plans.

(f) To assist the evaluation of the Concept Plans by the public in the Realization Stage, it is necessary to provide information for the sustainability indicators particularly those which can be expressed in quantitative terms, e.g. construction cost, operation cost, reclamation area, reduction/increase in harbour-front land area required for surface infrastructure, building height and building bulk, open space, pollution levels, etc. Qualitative evaluation of other indicators should also be presented.

(g) It is also essential to help the public to visualize the concepts through perspective drawings, physical models and/or computer animations.

10.1.1. In the Realization Stage, the public will be invited to provide comments on the Concept Plans. The set of sustainability principles and indicators will provide a useful evaluation framework. The main objective of Realization Stage is to obtain public consensus as far as possible on the most sustainable infrastructure solution and the corresponding harbour-front enhancement schemes.

10.1.2. While the Government and WDII consultants are preparing the Concept Plans, the Specialist Consultant team will prepare the Work Plan for the Realization Stage.

10.1.3. Before finalization of Concept Plans for public engagement, it would be useful to have a working session with the Sub-committee Members and the Collaborators to ensure that the majority public views are reflected in the Plans and to explain the reasons for not pursuing certain proposals.






Ideas and proposals received from the public during the Envisioning Stage and a number of the recommendations of the Expert Panel on Sustainable Transport Planning and Central – Wan Chai Bypass (Expert Panel) have implications which extend beyond the WDII area, the scope of HER and the WDII Review. These proposals and recommendations are noted in this Appendix, and require follow up at appropriate forums, including the main committee of the Harbour-front Enhancement Committee (HEC).

Land Use Development

- HEC should exchange views with Town Planning Board and advise relevant government departments on possible mechanisms to monitor the development on Hong Kong island north shore so that protection of the harbour, harbour-front enhancement, and the prospect of sustainable transport solutions will not be jeopardised.
- Members of the HEC WDII Review Sub-committee would like to concur with the Expert Panel's recommendation of short-term measures that "the Government should address the need to regulate land-use developments throughout the Corridor area in order not to aggravate the congestion problem in the Corridor before the Bypass opens".

Traffic Management

- Members of the HEC WDII Review Sub-commiitee would like to concur with the Expert Panel's recommendation that there is a need for short-term transport management measures such as loading/unloading restrictions, junction improvement, public transport route rationalization, etc., to tackle the traffic congestion problem prior to the opening of the Bypass.

A Sustainable Transportation System

- Besides traffic management measures such as road pricing, the Government should deepen its commitment made in the Third Comprehensive Transport Study (CTS-3) which promises to formulate the future transport framework using principles "of integrating land-use, transport and environmental planning and according priority to railways".
- Members of the HEC WDII Review Sub-committee would like to concur with the Expert Panel's recommendation that we need to seize opportunities to rationalize multi-modal public transport routes and improve connectivity with rail.

Island North Shore Harbourfront Enhancement Review

- The Government should develop a strategy to undertake an integrated harbour-front enhancement review for island north shore to ensure its sustainable development in the long run.
- The Government should endeavour to develop sustainability indicators and carry out sensitivity tests to evaluate various options. This is of fundamental importance when inevitable "trade-offs" are required, such as for example between vehicular capacity and designation of harbour-front land for incompatible uses. A transparent evaluation process is necessary.

Public Engagement Exercise

- HEC should review its engagement exercises and develop a proposal to streamline the process. The proposed process should be widely deliberated to seek ways to legitimise the means of public engagement.

This report is prepared by:
CITY PLANNING CONSULTANTS LTD
in association with
The Centre of Urban Planning & Environmental Management, The University of Hong Kong
PlanArch Consultants Ltd.
Urban Design and Planning Consultants Ltd.

附錄冊

Annex Volume

附件三

Annex C

CONSOLIDATION OF HARBOUR-FRONT & TRUNK ROAD IDEAS

Trunk Road Alignments & Harbour-Front Enhancement

April 2006

MAUNSELL CONSULTANTS ASIA LTD

CONSOLIDATION OF HARBOUR-FRONT & TRUNK ROAD IDEAS

REPORT TO THE HEC SUB-COMMITTEE ON WDII REVIEW
ON
TRUNK ROAD ALIGNMENTS & HARBOUR-FRONT ENHANCEMENT

LIST OF CONTENTS

1 INTRODUCTION

1.1 Background

1.1.1 The Sub-committee on Wan Chai Development Phase II (WDII) Review of the Harbour-front Enhancement Committee convened a 'Envisioning Stage – Consolidation Forum', on 12 November 2005, to conclude the public engagement activities of the Envisioning Stage of the 'Harbour-front Enhancement Review – Wan Chai, Causeway Bay and Adjoining Areas' (HER). The aim of the forum was to share with the public the comments and proposals received during the public engagement activities held from May to July 2005 for the Envisioning Stage of HER. The forum also provided opportunities to involve the public in consolidating these views before proceeding with the preparation of the Concept Plan(s) for the development and enhancement of the harbour-front of Wan Chai, Causeway Bay and the adjoining areas.

1.1.2 Whilst the emphasis of the HER is on the planning of the harbour-front with a view to protecting the Harbour and improving accessibility, utilisation and vibrancy of the harbour-front areas, a holistic approach must be taken in integrating the harbour-front development with essential transport infrastructure required under the WDII project, this being mainly the need to complete a long-planned strategic road link along the north shore of Hong Kong Island, ie the Trunk Road connecting Rumsey Street Flyover in Central and the Island Eastern Corridor (IEC) to the east of Causeway Bay. Any land that may be formed along the shoreline to facilitate the Trunk Road construction will then provide further opportunity for harbour-front improvement.

1.1.3 A number of Trunk Road options have been reviewed together with harbour-front enhancement suggestions put forward by the public, for the derivation of consolidated harbour-front and Trunk Road ideas that would then form the basis of the preparation of Concept Plan(s). In reviewing these various ideas, a number of issues have arisen in respect of Trunk Road alignments and form of construction, and associated requirements of reclamation, the impacts of ground level roads and slip roads on harbour-front planning intentions, and harbour-front enhancement ideas to be taken on board to achieve the public's vision for a high quality and vibrant waterfront. These issues need to be addressed by the Sub-committee on WDII Review in the next stage of the HER project, the Realization Stage.

1.2 The CFA Judgement and WDII Review

1.2.1 The Court of Final Appeal (CFA) handed down its judgement on 9 January 2004 in respect of the judicial review on the Draft Wan Chai North OZP (S/H25/1).

1.2.2 According to the CFA judgement, the presumption against reclamation specified in the Protection of the Harbour Ordinance (PHO) can only be rebutted by establishing an overriding public need for reclamation. This need (ie the economic, environmental and social needs of the community) must be a compelling and present need with no reasonable alternative to reclamation (all circumstances including the economic, environmental and social implications should be considered). A compelling and present

need goes far beyond something which is "nice to have", desirable, preferable or beneficial. But on the other hand, it would be going much too far to describe it as something in the nature of a last resort, or something which the public cannot do without.

1.2.3 Following the CFA judgement, and in response to a request by the Town Planning Board, Government has undertaken to conduct a planning and engineering review of the development and reclamation proposals for the WDII project (the 'WDII Review'). WDII proposals, including the Trunk Road, must comply with the overriding public need test.

1.2.4 The Harbour-front Enhancement Committee (HEC) was established in May 2004 to advise the Government, through the Secretary for Housing, Planning and Lands, on the planning, land uses and developments along the existing and new harbour-front of Victoria Harbour. As an overview to harbour-front planning, the HEC has established a number of harbour planning principles which should be followed when examining Trunk Road and harbour-front enhancement schemes. These are:

- preserving Victoria Harbour as a natural, public and economic asset
- Victoria Harbour as Hong Kong's identity
- a vibrant harbour
- an accessible harbour
- maximising opportunities for public enjoyment
- integrated planning for a world-class harbour
- sustainable development for the harbour
- early and ongoing stakeholder engagement.

1.2.5 The HEC has set up a Sub-committee, namely the Sub-committee on WDII Review, to advise on the WDII Review. The Government has accepted the recommendation by the Sub-committee on WDII Review that enhanced participation should be a key element of the Review. To achieve this, a public engagement exercise, namely the HER, is being carried out under the steer of the Sub-committee on WDII Review. Results of the HER project will provide inputs to the WDII Review.

1.3 HER Project and Status

1.3.1 In order to achieve a better understanding of the opportunities for waterfront enhancement and to ensure a high degree of community support for the future draft Outline Zoning Plan (OZP) and the draft Recommended Outline Development Plan (RODP), a 3-stage public engagement strategy has been formulated so as to enable a more structured approach to be adopted to the HER public engagement activities:

(i)	"Envisioning Stage"	Public to provide their visions, wishes and concepts, as well as Sustainability Principles and Indicators as a basis for the development of the Concept Plan(s)

(ii)	"Realization Stage"	Public to evaluate Concept Plan(s) to arrive at consensus
(iii)	"Detailed Planning Stage"	Ensure draft OZP and draft RODP reflect consensus.

1.3.2 The Envisioning Stage was formally launched on 22nd May 2005, with a wide range of public engagement activities taking place over a two-month public engagement period. The envisioning exercise was to engage the public in identifying the key issues and establishing principles in terms of improving the waterfront. The concept of sustainable development underpins the whole HER project. A list of sustainability principles and indicators have been prepared and agreed through the public consultation process; these agreed sustainability principles and indicators will be used to evaluate the Concept Plan(s) to be developed in the Realization Stage.

1.3.3 Following the conclusion of the public engagement activities of the Envisioning Stage, with the 'Envisioning Stage – Consolidation Forum', the various issues that have been raised by participants during the Envisioning Stage consultation, in respect of Trunk Road alignments and harbour-front enhancement ideas, will need to be addressed by the Sub-committee on WDII Review as part of the process of consolidating harbour-front and Trunk Road ideas, that would then form the basis of the preparation of the Concept Plan(s) in the Realization Stage. These Concept Plans, for the development and enhancement of the harbour-front under the ambit of the WDII Review, will be created for evaluation and consensus by the public, using the HEC's harbour planning principles and the sustainability principles and indicators that have been developed during the Envisioning Stage.

1.4 Need for the Trunk Road

1.4.1 The existing east-west corridor (Connaught Road Central / Harcourt Road / Gloucester Road) serving the Central Business District on Hong Kong Island is already operating beyond its capacity, as can be observed on site. Previous and recent strategic transport studies have predicted further increase in traffic demand along the east-west corridor, and confirmed the need for a parallel east-west Trunk Road to avoid more extensive and frequent traffic congestion, and even gridlock, on the road network.

1.4.2 A district traffic study has confirmed that a dual 3-lane Trunk Road (or Central-Wan Chai Bypass), together with intermediate slip roads, is required to divert traffic away from the existing east-west corridor and to provide adequate relief to the corridor and the local road network. The need for the Trunk Road has also been confirmed by the Expert Panel on Sustainable Transport Planning and Central-Wan Chai Bypass ('Expert Panel'), which consists of independent local and overseas experts in the relevant fields.

1.4.3 Among the package of measures recommended, the Expert Panel recommends the construction of a bypass as a medium-term solution to tackle the problem of deteriorating traffic congestion in the Central and Wan Chai area. The Expert Panel considers that the Trunk Road is essential for improving the network reliability of the east-west link. Reference can be made to 'Report of the Expert Panel on Sustainable Transport Planning and Central-Wan Chai Bypass' ('Report of the Expert Panel').

1.4.4 The need for the Trunk Road has therefore been clearly established. What is required now is to take a holistic approach to the planning of the harbour-front, where waterfront land use planning is examined together with the planning of essential transport infrastructure, in line with the principle of sustainable development and the HEC's harbour planning principles. One of the primary concerns in this process is to start off with an acceptable Trunk Road scheme: one that meets functional traffic requirements; is practically feasible to implement; that can avoid reclamation or, if not, then minimise reclamation, in compliance with the PHO and the CFA ruling on the presumption against reclamation in respect of this ordinance.

1.5 Envisioning Stage Report

1.5.1 The 'Harbour-front Enhancement Review – Wan Chai, Causeway Bay and Adjoining Areas, Envisioning Stage Public Engagement Report, March 2006' ('Envisioning Stage Report') summarises the public comments received during the Envisioning Stage public engagement exercise. These include input and feedback from public forums, community charrettes, opinion surveys, written submissions, the Expert Panel Forum and the Consolidation Forum, as well as parallel discussions with District Councils, Town Planning Board, Legislative Council and the HEC Sub-committee on WDII Review.

1.5.2 The conclusions of the Envisioning Stage Report are extracted and repeated here for reference:

- In the various public engagement activities in the Envisioning Stage, there is obvious consensus among the public on the need for enhancement of the harbour-front in the following aspects. Indeed, the public urges the Government to take immediate actions wherever possible to enhance the quality and the usage of the existing harbour-front.
  - (a) Increase vibrancy through provision of facilities for diverse use on land and on the water.
  - (b) Enhance connectivity between the harbour-front and the hinterland, and continuity of the harbour-front.
  - (c) Ensure land and marine use compatibility in terms of function and design.
  - (d) Enhance identity of Hong Kong by conserving natural and cultural heritage.
  - (e) Harbour is the greatest natural heritage and minimize harbour reclamation is the key.
  - (f) Enhance visual amenity, landscape and quality of space with emphasis on greening and flexible use of space and less building structures.
  - (g) Enhance environmental quality with particular attention on the existing water quality in the typhoon shelter and the form of CWB in that more support goes to tunnel form.
  - (h) Devise an acceptable and sustainable solution for the present traffic and infrastructure issues.

- There are many specific suggestions for achieving the above enhancement objectives and a consolidated set of sustainability principles and indicators has been developed through the participation of the public.

- There is also majority support for the need to improve the traffic conditions along the Connaught Road/ Gloucester Road Corridor for a comprehensive harbour-front enhancement. The Government has put up a strong case for building the CWB as a fundamental solution with traffic management schemes as complementary measures. There are divided views among the public on the absolute need for the CWB. However, the results of the opinion surveys show a clear majority in favour of constructing the CWB together with traffic management measures. On this issue, HEC and the Government organized a Transport Expert Forum on 3 September 2005 to have an impartial and in-depth deliberation, from which a conclusion based on the majority view of the expert panel has been drawn. The Expert Panel was provided with detailed traffic data and models. No detailed road design information identifying the impact on harbour-front land use and harbour-front enjoyment of the various options was available at this stage.

- The expert panel concludes that doing nothing is not sustainable, and the provision of the CWB alone or implementing road pricing alone is not sustainable either. The panel observes that long term sustainability warrants the implementation of both electronic road pricing and the construction of the CWB. To facilitate access to the waterfront and the enjoyment thereof by the public should be made a priority in the development of the CWB. The panel has put forward short-term, medium-term and long-term measures to achieve a sustainable transport strategy. Of particular reference to the current concept planning for the WDII Review, the panel's recommendations include:

  (a) Take a holistic approach towards transport/ land use planning and fortify the simultaneous integration of land use and transport planning, placing due emphasis on the limitation of excessive transport infrastructural development in heavily congested areas.

  (b) Support the construction of CWB as an essential link in the strategic road network.

  (c) Support the construction of slip roads around the HKCEC and Victoria Park Road/Gloucester Road/Hing Fat Street.

  (d) Recognize the need for Road P2 as an important *ad interim* measure in addressing traffic congestion in the Central reclamation area before CWB comes about. Suggest Government to review the scale of P2 to match the gradual land development programme. While it may be necessary to reserve sufficient land for the full-scale development of Road P2 over the longer term, the Government should explore introducing *pro-tempore* traffic calming measures on Road P2 and greening reserve area in the meantime.

  (e) Improve pedestrian connections to the harbour-front in the interim and long terms. Enhance the Victoria harbour-front and properly address the visual and environmental impacts and social concerns arising from the construction of the multi-billion dollar Bypass, in addition to improving pedestrian access.

(f) Seize the opportunities to rationalize multi-modal public transport routes and improve connectivity with rail.

- The public mostly provided their views and proposals for the waterfront areas between the HKCEC and the IEC. But there were also views expressed for the waterfront areas west of the HKCEC including the CRIII areas. They included the importance of sustainable land use/ transport planning in that a review on the intensity of planned land uses on CRIII and Tamar was called for; a formal waterfront at CRIII as compared with an informal waterfront at WDII; and depressing existing waterfront access roads to enhance pedestrian connectivity to the harbour, etc.

1.5.3 The recommendations of the Envisioning Stage Report are also extracted and repeated here for reference:

- Fortify the integration of land use and transport planning, placing due emphasis on the limitation of excessive transport infrastructural development in heavily congested areas.

- Prepare Land Use Concept Plans based on at least two highway options, viz, tunnel and flyover with minimum reclamation and harbour-front land use possible for each option or option variations. It is not necessary to have a Concept Plan without the CWB. While the public's concern over the visual impact of a flyover option is fully appreciated, it is not recommended to be dropped at this stage until more comprehensive information on the flyover option is provided at the next stage.

- With regard to provision of P2, slip roads, tunnel portals and other surface infrastructure, more details should be provided including engineering details, surface land occupied, reclamation required, pedestrian connectivity and visual impact. The traffic impact for the different options should also be covered.

- In preparing the Concept Plans, the Government should take full account of the sustainability principles and indicators *(as presented in the Envisioning Stage Report)*, and the public's suggestions on the harbour-front enhancement measures, activity nodes and the possible land uses within the nodes as reported in previous sections and summarized in Figures 3.2 to 3.4 *(of the Envisioning Stage Report).* If there are technical problems for certain ideas, clear explanations should be provided.

- With regard to the heliport proposals, the government's 2-pad proposal, and the Regional Heliport Working Group's 4-pad proposal may be incorporated as inserts for the Concept Plans.

- To assist the evaluation of the Concept Plans by the public in the Realization Stage, it is necessary to provide information for the sustainability indicators particularly those which can be expressed in quantitative terms, e.g. construction cost, operation cost, reclamation area, reduction/increase in harbour-front land area required for

surface infrastructure, building height and building bulk, open space, pollution levels, etc. Qualitative evaluation of other indicators should also be presented.

- It is also essential to help the public to visualize the concepts through perspective drawings, physical models and/or computer animations.

1.6 Purpose of this Report

1.6.1 In moving forward to the development of the Concept Plan(s) in the Realization Stage of the HER project, a number of issues relating to Trunk Road alignments and form of construction, requirements for reclamation, impacts of highway infrastructure on harbour-front planning intentions, and harbour-front enhancement ideas to be taken on board, raised during the Envisioning Stage consultation, need to be addressed by the Sub-committee on WDII Review.

1.6.2 This Report to the HEC Sub-committee on WDII Review outlines the appraisal of these issues and the conclusions in respect of the feasibility or acceptability of Trunk Road alignments and harbour-front enhancement ideas.

2 TRUNK ROAD ROUTE ASSESSMENT

2.1 Alignment Constraints through the WDII Project Area

2.1.1 The derivation of Trunk Road alignments through the WDII project area is constrained by the mainline connections at either end to existing or committed road alignments, slip road connections in Wan Chai North and Causeway Bay, existing cross harbour tunnels such as the MTR Tsuen Wan Line and the Cross Harbour Tunnel (CHT), proposed rail infrastructure such as the MTR North Island Line (NIL) and the Shatin to Central Link (SCL), services infrastructure such as electricity sub-stations and sewage treatment plants, and existing development and land uses along the northshore.

2.1.2 Affected facilities such as water mains, sewage outfalls, cooling water systems, drainage outfalls and ferry piers, etc, can be reprovisioned and, as such, should not be regarded as fixed or immovable constraints to the Trunk Road alignment. However, cross harbour road and rail tunnels, major infrastructure development such as sewage treatment works and electricity sub-stations, and existing developments such as the Hong Kong Convention and Exhibition Centre (HKCEC), do form physical barriers around which the Trunk Road will need to be routed.

2.1.3 The following paragraphs outline some of the major constraints to the Trunk Road alignment. These are also highlighted in **Figure 2.1**.

Trunk Road Connections

2.1.4 At the western end of the WDII project area, connection is required to the Trunk Road tunnel which will be constructed under Central Reclamation Phase III (CRIII). The optimal Trunk Road alignment through CRIII has already been determined (reference can be made to 'A Review of Central Reclamation Phase III by applying the Court of Final Appeal's "Overriding Public Need Test", April 2004'). The eastern end of the Trunk Road tunnel in CRIII is located to the west of the HKCEC Extension, near Lung King Street, and forms the starting point of the Trunk Road at the western end of the adjacent WDII project area. The Trunk Road is a cut-and-cover tunnel with a road level of –10mPD and top of tunnel structure at around –1mPD (ie above existing seabed level) at this connection point.

2.1.5 To the east of the Causeway Bay Typhoon Shelter (CBTS), the Trunk Road needs to connect to the existing elevated IEC road structure at a road level between +12mPD and +15mPD. The Trunk Road must therefore rise onto elevated road structure to make this connection.

2.1.6 These connecting constraints mean that all schemes for the Trunk Road alignment through the WDII project area will start off in tunnel at the western end and end up as elevated road structure at the eastern end.

Slip Road Connections

2.1.7 One of the key issues for the Trunk Road alignment is to ensure adequate connectivity with the local road network. If the Trunk Road is to achieve its purpose in serving as a strategic east-west link, by getting traffic out of the currently built-up and congested northshore urban area, it must also ensure adequate access to the Wan Chai and Causeway Bay areas. Otherwise, if traffic is unable to get onto or off the Trunk Road at suitable locations, the new road cannot be properly utilised and will not be able to relieve congestion along the Connaught Road Central / Harcourt Road / Gloucester Road corridor.

2.1.8 The following slip road connections (illustrated indicatively in Figure 2.1) have been identified as essential in meeting traffic demand and enabling the Trunk Road to adequately perform its function of relieving traffic from the overloaded Connaught Road Central / Harcourt Road / Gloucester Road corridor:

- slip road from the eastbound Trunk Road to Wan Chai North, allowing traffic from the Western and Central areas to Wan Chai and HKCEC to bypass Connaught Road Central, Harcourt Road and Gloucester Road ('Slip Road 1');
- slip road from Wan Chai North to the eastbound Trunk Road, allowing traffic from the Admiralty area and Wan Chai to Island East to bypass Gloucester Road and Victoria Park Road ('Slip Road 2');
- slip road from the westbound Trunk Road to Wan Chai North, allowing traffic from Island East to Wan Chai to bypass Victoria Park Road and Gloucester Road ('Slip Road 3');
- slip road from Victoria Park Road to the westbound Trunk Road, allowing traffic from North Point, Fortress Hill, Tin Hau and Tai Hang areas to Central to bypass Victoria Park Road, Gloucester Road and Harcourt Road ('Slip Road 8').

2.1.9 The Trunk Road form of construction, and alignment and level, through Wan Chai North and Causeway Bay must facilitate the provision of these slip roads.

MTR Tsuen Wan Line

2.1.10 The Trunk Road and reclamation at the west side of the HKCEC Extension must not impose any loads on, or cause any significant movement of, the existing MTR Tsuen Wan Line tunnel. Tunnelling under the MTR Tsuen Wan Line would need to be at sufficient depth (around –60mPD) to avoid disturbance to the existing ground and movement of the MTR tunnel; this depth for the Trunk Road cannot be achieved without exceeding tunnel gradients limitations from the fixed connection to the existing road network at the Central Interchange; conversely, the Trunk Road connection to the Central Interchange and the existing Rumsey Street Flyover cannot be achieved for the resulting deep Trunk Road tunnel under the MTR tunnel. (Further clarification is provided in Section 3.)

2.1.11 Moreover, a deep Trunk Road tunnel beneath the MTR Tsuen Wan Line would mean that the slip road connections in Wan Chai North (Slip Roads 1, 2 and 3) cannot be

provided for this scheme, due to gradient limitations; the slip roads cannot rise to ground level from this depth without exceeding maximum permissible road gradients.

2.1.12 Instead, Trunk Road schemes that cross over the top of the MTR tunnel need to be pursued. A piled Trunk Road tunnel structure that can span across the MTR tunnel provides a feasible solution. In this case, the Trunk Road tunnel structure will lie completely above the seabed level, with a road level of around –7mPD (the MTR tunnel being an immersed tube tunnel that lies just below the seabed). Taking into account the height of the Trunk Road tunnel, the top of the tunnel structure would then lie above sea level, at a level of around +2.5mPD, and needs to be contained within reclamation.

Cross Harbour Tunnel

2.1.13 The CHT is an immersed tube tunnel constructed in 1970, comprising a thin steel external shell lined internally with reinforced concrete. The immersed tube section of the CHT is considered to be particularly fragile and susceptible to damage due to movement, particularly when the age of the CHT is taken into account. Repair work would be extremely difficult. Given the susceptibility of the old CHT to damage, a near zero movement tolerance would need to be imposed for any Trunk Road tunnel crossing, which will be extremely difficult to ensure. As a result, the risk of damage due to any Trunk Road tunnel scheme passing beneath the immersed tube section of the CHT will be very (indeed, unacceptably) high. Movement of the CHT structure leading to failure of the waterproofing membrane or the structure itself would have major consequential impacts to the high volumes of traffic through the tunnel. The resulting traffic congestion on Hong Kong Island and in Kowloon would be severe, to the extent that any damage whatsoever to the CHT would give rise to an unacceptable situation.

2.1.14 On the other hand, an elevated Trunk Road crossing over the CHT would be acceptable from a construction risk point of view, or else tunnelling under the portal and approach ramp of the CHT may be possible within manageable bounds of construction risk. In this case, though, the Trunk Road tunnel would need to take into account the rock anchors that tie down the approach ramp structure to the underlying rock, which are used to prevent uplift caused by hydrostatic forces (flotation). If these rock anchors were to be released due to tunnelling operations below, without any compensating holding down loads, then the CHT approach structure would fail under the action of uplift pressures. The rock anchors, based on available as-built information, are installed to a depth of around –17mPD. Tunnelling through the anchorage zone would be technically complex and would involve a high degree of risk. Tunnelling under the CHT approach structure should be deep enough to avoid conflict with these anchors; to achieve this, the Trunk Road level would need to be at around –30mPD for a tunnel box section, or deeper for a bored tunnel section.

NIL and SCL Rail Tunnels

2.1.15 The NIL is a proposed extension of the MTR system along the northshore of Hong Kong Island, and allowance needs to be made for the NIL alignment in planning for the Trunk Road. The alignment for the NIL is proposed to run within existing land along the northshore area of Causeway Bay and Wan Chai to an Exhibition Station located beneath

the existing Wan Chai North Public Transport Interchange (PTI). From there, the NIL tunnel will run partly through the HKCEC water channel in cut-and-cover tunnel, crossing over the MTR Tsuen Wan Line with similar form of construction as that proposed for the Trunk Road crossing, and then continuing westwards along the Central shoreline through the CRIII project area.

2.1.16 Allowance also needs to be made for the proposed fourth harbour rail crossing of the SCL. The SCL will be an immersed tube tunnel from Hung Hom across the Harbour (alternative easterly and westerly alignments have been proposed) to the breakwater of the CBTS, from where the tunnel will change to bored tunnel under the typhoon shelter, for both alternative alignments, but with a possible Causeway Bay North Station under Gloucester Road in front of the Excelsior Hotel for the easterly alignment. From there, the SCL alignment will run under the Wan Chai Sports Ground to an Exhibition Station located in Harbour Road, then continuing westwards under Harbour Road and Fenwick Pier Street to Admiralty Station.

Existing Services Infrastructure

2.1.17 The major services infrastructure of concern in the Wan Chai North area is Hong Kong Electric's Wan Chai Zone Sub-Station on Hung Hing Road and new Electricity Receiving Station (under construction) on Wan Shing Street, and Drainage Services Department's Wan Chai East Sewage Screening Plant on Hung Hing Road.

2.1.18 The Electricity Sub-Station and Receiving Station have closed-spaced bored piled foundations down to founding levels of around –35mPD, which will obstruct any Trunk Road tunnel alignments running beneath these facilities. The Trunk Road would need to be at a level of around –60mPD to clear the foundation piles; this level is too deep for a Trunk Road tunnel to reach, after the high level crossing over the top of the MTR Tsuen Wan Line. In addition, it would not be possible to provide Slip Roads 2 and 3 to Wan Chai North, as the slip roads cannot rise to ground level from this depth without exceeding maximum permissible road gradients.

2.1.19 The Sewage Screening Plant comprises a pumping station with a well that extends down to a level of around –23mPD, and which is then founded on bored pile walls down to a founding level of around –35mPD, as well as screening plant facilities on bored pile foundations which also extend down to founding levels of around –35mPD. As for the case with the Electricity Sub-Station, these foundations will obstruct any Trunk Road tunnel alignments running beneath the Sewage Screening Plant site.

2.1.20 Reprovisioning these major electricity supply and sewerage facilities would involve locating suitable alternative sites in the already congested northshore area and then the relaying of all the high voltage feeder cables in Wan Chai and the reconstruction of sewage pipelines that currently gravitate to the existing sewage plant, through the congested streets of Wan Chai. This would incur major costs to the community, and result in massive disruption to these essential services and to the whole of the Wan Chai business and residential district, and is considered to be impractical and unreasonable, even if alternative sites could be found (identifying suitable relocation sites will be difficult). Therefore, relocating the electricity supply and sewerage facilities, in order to

remove their constraint on the Trunk Road alignment, is considered not practically feasible from land use, engineering and land administration points of view.

Existing Development and Land Uses

2.1.21 Major development in Wan Chai North includes the HKCEC Phase I and the HKCEC Extension, Grand Hyatt Hotel, Arts Centre, Telecom House, Shui On Centre, Wanchai Tower, Revenue Tower, Immigration Tower, Central Plaza, Renaissance Harbour View Hotel, Great Eagle Centre, Harbour Centre, China Resources Building, Causeway Centre and Sun Hung Kai Centre.

2.1.22 These buildings all have basement level development and piled foundations that extend down to bedrock (which varies around –30mPD to –40mPD in this area). This existing development therefore forms a physical barrier to the Trunk Road.

2.1.23 Similarly, existing development along the south side of Gloucester Road forms a barrier to Trunk Road alignments all the way through to Causeway Bay.

2.1.24 At Kellett Island, the Royal Hong Kong Yacht Club (RHKYC) is an existing land use which should be avoided, if possible (the RHKYC clubhouse is considered by the Antiquities and Monuments Office to be a building of historical significance).

2.2 Trunk Road Route Corridors through WDII Project Area

2.2.1 Three possible corridors can be considered when examining potential Trunk Road alignments between the CWB in CRIII and the IEC to the east of the CBTS (**Figure 2.2**):

(i) An ‘offshore corridor’, where the Trunk Road alignment turns seawards (northwards) after the connection with the CWB in CRIII and runs through the harbour until turning back to connect with the IEC further east in North Point.

(ii) An ‘inland corridor’, where the Trunk Road alignment turns inland (southwards) after the connection with the CWB in CRIII and runs through existing land in tunnel, following roughly the Gloucester Road passageway and joining up with the existing IEC in front of Victoria Park.

(iii) A ‘foreshore corridor’, where, after passing through the HKCEC water channel in tunnel, the Trunk Road runs along the Wan Chai shoreline and through the CBTS either as tunnel, at-grade or elevated road, joining up with the existing IEC at the eastern end of the typhoon shelter (or further to the east of the typhoon shelter along the North Point shoreline).

2.3 Offshore Alignments

2.3.1 Offshore Trunk Road alignments face a major physical constraint in the form of the HKCEC Extension. Design standards limit the minimum horizontal curvature, which means that, from the connection with the CWB tunnel in CRIII, the Trunk Road will not be able to turn northwards sharply enough to avoid the HKCEC Extension building or its foundations (see **Figure 2.3**).

2.3.2 The HKCEC Extension building presents a physical obstruction to elevated Trunk Road alignments, as the road cannot rise steeply enough to clear the roof of the HKCEC Extension (at +71mPD); therefore an elevated offshore alignment is not possible.

2.3.3 Keeping the Trunk Road in tunnel is the obvious preference, but, as the Trunk Road will first need to cross over the existing MTR Tsuen Wan Line, the high level of the Trunk Road tunnel (above water level) at this point means that it will not be able to drop down fast enough to avoid conflict with the basement of the HKCEC Extension. The top of the Trunk Road tunnel structure when it reaches the HKCEC Extension building will be at a level of around –0.5mPD while the level of the HKCEC Extension basement is at around –1mPD, then the HKCEC Extension foundation piles extend down to a founding level of around –30mPD. Therefore, Trunk Road tunnel alignments will conflict physically with the HKCEC Extension and its foundations.

2.3.4 Further eastwards, an offshore Trunk Road tunnel will need to pass beneath the CHT. As discussed in para 2.1.13 above, construction risk for any Trunk Road tunnel scheme crossing the immersed tube section of the CHT will be very high, with unacceptable consequences in the (likely) event of damage to the CHT.

2.3.5 Putting aside the risk of damage to the CHT, an offshore Trunk Road tunnel will need to be constructed as a deep bored tunnel in order to pass beneath the CHT. This will mean that the slip road connections in Wan Chai North (Slip Roads 1, 2 and 3) and in Causeway Bay (Slip Road 8) cannot be provided for this scheme.

2.3.6 The high construction risk of tunnelling across the CHT, the inability of providing the necessary slip road connections and, primarily, the physical obstruction of the HKCEC Extension make the Trunk Road offshore alignments not feasible.

2.4 Inland Alignments

2.4.1 Inland Trunk Road alignments face major physical constraints, mainly due to conflicts with existing developments and highway infrastructure, and conflicts with the future rail infrastructure. At-grade or elevated Trunk Road inland alignments are self-evidently not possible in view of the scale of existing building development and infrastructure, and consideration of inland alignments is therefore confined to tunnel options.

2.4.2 **Figure 2.4** shows a Trunk Road tunnel turning inland (southwards) immediately after the connection with CRIII.

2.4.3 After turning southwards from the connection with the tunnel constructed under CRIII, and crossing over the existing MTR Tsuen Wan Line, the Trunk Road will be obstructed by building development in Wan Chai North. Due to the high level of the Trunk Road as it passes over the MTR tunnel and Trunk Road gradient limitations, the inland tunnel alignment will conflict with the basement and foundations of the HKCEC Phase I and the Grand Hyatt Hotel (the Trunk Road tunnel cannot drop down fast enough after crossing the MTR Tsuen Wan Line to avoid conflict with the foundations of these buildings). Thereafter, the Trunk Road tunnel will also conflict with the China Resources Building, Causeway Centre and Sun Hung Kai foundations.

2.4.4 As it turns inland after passing over the MTR Tsuen Wan Line, the Trunk Road will also need to cross the NIL rail tunnel, but both the Trunk Road and the NIL tunnels will be at the same level at this location, as both will cross over the MTR Tsuen Wan Line at a similar (adjacent) location. Therefore, either the presence of (or allowance for) the NIL will obstruct the Trunk Road inland alignment, or the implementation of a Trunk Road inland alignment will mean that the NIL cannot be constructed.

2.4.5 Further east, in Causeway Bay, the Trunk Road inland alignment will need to run under Gloucester Road where it will conflict with both the NIL and SCL tunnels and the proposed Causeway Bay North station. Alignments further south of Gloucester Road, to avoid this conflict, are not possible due to the wall of existing development on the south side of Gloucester Road.

2.4.6 Connection to the existing IEC will need to be made to the north of Victoria Park. Self-evidently, inland alignments cannot be taken further inland around the south of the typhoon shelter to connect with the IEC in North Point, due to the mass of existing building development in the Tin Hau / Fortress Hill area. To achieve the connection with the IEC, the Trunk Road tunnel will need to rise up to a portal located in the northern 'knoll' area of Victoria Park. This not only results in demolition and permanent removal of this heavily wooded area of the park, but as the Trunk Road rises up to connect with the IEC it will cut off the westbound Victoria Park Road.

2.4.7 As a consequence of the above physical obstructions and constraints, this Trunk Road inland alignment is found to be not feasible.

2.4.8 Alternative inland alignments have been examined with a view to avoiding some of these constraints. **Figure 2.5** shows a Trunk Road tunnel turning inland further east, through the Wan Chai Sports Ground, to avoid conflict with the Harbour Centre and Sun Hung Kai foundations. In this case, the Trunk Road will conflict with the NIL Exhibition Station in Wan Chai North, as gradient limitations mean that it will not be able to pass beneath the NIL station foundations. Similar to the case above, either allowance for the NIL will obstruct this Trunk Road inland alignment, or the implementation of this Trunk Road inland alignment will mean that the NIL cannot be constructed. Moving the inland alignment even further east to avoid the conflict with the NIL Exhibition Station (also shown in **Figure 2.5**) will result in conflict with the major services infrastructure at Hung Hing Road.

2.4.9 Then, with this Trunk Road alignment turning inland further to the east, it will conflict with the foundations of the CHT approach roads structures. While smaller (around 7m diameter) rail tunnels may be able to thread their way through these numerous foundations, with underpinning of some of the foundations where conflict cannot be avoided, the Trunk Road tunnel is an approximately 35m wide structure that will require demolition of large sections of the existing CHT approach structures to facilitate its construction. Traffic disruption and impacts, particularly to the CHT traffic, will be unacceptable.

2.4.10 Further east in Causeway Bay, where the Trunk Road runs under Gloucester Road and then rises up to a tunnel portal in Victoria Park to connect with the IEC, constraints

(conflicts with NIL and SCL, demolition of the park 'knoll', and cutting off Victoria Park Road) will be similar to the previous inland alignment case.

2.4.11 In view of the above, these alternative Trunk Road inland alignments are also considered not feasible, primarily due to physical conflict with existing development and infrastructure.

2.5 Foreshore Alignments

2.5.1 At the western end of the WDII project area, the passageway through the HKCEC water channel presents a physical constraint to the Trunk Road alignment, both horizontally and vertically, after it passes over the MTR Tsuen Wan Line. An elevated road will clash with the atrium bridge (which has a soffit level around +12mPD and a top of roof level at +41mPD), and cannot be constructed without demolishing this essential element of the HKCEC and its Extension. At-grade road options for the Trunk Road would conflict with the ground level road system. An at-grade Trunk Road would also present a physical barrier that will cut off ground level road and pedestrian access to the HKCEC Extension from Wan Chai North. The water channel itself, on the other hand, provides an opportunity for tunnel options that can be constructed in the narrow gap between the foundations of the HKCEC and the HKCEC Extension.

2.5.2 The shallow tunnel through the HKCEC water channel also means that the Wan Chai North slip road connections to the existing ground level road network can be readily provided, while meeting the necessary highway design standards.

2.5.3 After leaving the HKCEC water channel, foreshore alignments of the Trunk Road will run along the Wan Chai shoreline and through the ex-Public Cargo Working Area basin ('PCWA basin'). The alignment here is determined mainly by infrastructure constraints, in particular the crossing at the CHT. As mentioned in para 2.1.14, the feasible crossing point (for a Trunk Road in tunnel) is below the CHT approach (portal) structure, at a sufficiently deep level to avoid the CHT rock anchors. Alternately, a Trunk Road on flyover can cross over the CHT portal area. Trunk Road tunnel alignments further north will result in high risk of damage to the immersed tube section of the CHT, while more southerly alignments are constrained by the Wan Chai East Sewage Screening Plant and the Electicity Sub-station on Hung Hing Road.

2.5.4 The Trunk Road alignment must then pass through (under or over) the CBTS to connect with the existing IEC to the east of the typhoon shelter. Trunk Road tunnels that do not require reclamation can pass beneath the typhoon shelter without disrupting the marine uses, but Trunk Road flyovers should be kept as close as possible to the CBTS shoreline in order to minimise impacts to the typhoon shelter operations.

2.5.5 Other conflicts in the Causeway Bay area to be avoided for foreshore alignments are the RHKYC and the SCL. The provision of Slip Road 8 will also influence the Trunk Road form and alignment; connection from the existing ground level road network can be made to relatively shallow Trunk Road cut-and-cover tunnels or to flyovers, but limitations on tunnel gradients would mean that this slip road connection to deep bored tunnels is not possible.

2.5.6 Trunk Road tunnels will need to rise up onto elevated road to connect with the IEC. This connection can be either directly at the eastern end of the CBTS (in which case the Trunk Road tunnel will need to rise up above seabed level through the typhoon shelter to make this connection) or further east along the North Point shoreline (with the Trunk Road tunnel remaining below seabed level through the typhoon shelter and only rising up above the seabed to the east of the typhoon shelter, along the outside of the existing IEC). A Trunk Road flyover can connect directly to the IEC at the eastern end of the CBTS.

2.5.7 In conclusion, though, there are no insurmountable constraints to foreshore alignments for the Trunk Road. Foreshore alignments are feasible, and consideration of these alignments is focussed primarily on the determination of the best practical form of construction in overcoming conflicts and minimising impacts and the extent of reclamation.

2.6 Summary of Trunk Road Route Assessment

2.6.1 Alternative routeings for the Trunk Road along offshore, inland and foreshore corridors have been examined to determine practicable and feasible Trunk Road alignments. Trunk Road alignments are, however, constrained by existing development along the Wan Chai and Causeway Bay northshore area, existing cross harbour tunnels, proposed rail infrastructure and essential services infrastructure.

2.6.2 Offshore alignments are obstructed by the HKCEC Extension, will pose unacceptable risk to the CHT when tunnelling beneath it, and cannot provide the necessary slip road connections. Due primarily to the physical conflict with the HKCEC Extension, Trunk Road offshore alignments are found to be not feasible.

2.6.3 Inland alignments are obstructed by existing development in Wan Chai North, including the HKCEC Phase I, Grand Hyatt Hotel, Great Eagle Centre and Sun Hung Kai Centre. Trunk Road inland alignments will also conflict with the proposed NIL and SCL rail infrastructure, and existing road and services infrastructure. Due to these physical conflicts, Trunk Road inland alignments are also found to be not feasible.

2.6.4 The most reasonable and practical Trunk Road routeing is along the foreshore of Wan Chai and Causeway Bay. After crossing over the MTR Tsuen Wan line, the Trunk Road will run in shallow tunnel through the HKCEC water channel and along the Wan Chai shoreline. Thereafter, the Trunk Road can pass either below the CHT portal in tunnel or over the top of the CHT portal as flyover, continuing through the CBTS to a connection with the existing elevated IEC to the east of the typhoon shelter. The issues to be addressed when appraising foreshore alignments are related mainly to the determination of the best practical form of construction and minimising the extent of reclamation.

3 NO-RECLAMATION ALIGNMENTS

3.1 The Need for Reclamation

3.1.1 The need for reclamation for Trunk Road construction was a primary concern raised during the public engagement activities of the Envisioning Stage. When investigating Trunk Road schemes, any reasonable alignments that do not require or result in reclamation (ie "no-reclamation alignments") need to be identified and pursued, in accordance with the CFA ruling on the presumption against reclamation in respect of the PHO.

3.1.2 In Section 2, offshore and inland alignments, which could conceivably be thought of as "no-reclamation alignments" (if excepting unavoidable reclamation at the tie-in to CRIII), were found not feasible due to conflict with existing development and infrastructure.

3.1.3 Trunk Road alignments along the foreshore corridor were found to be feasible. However, foreshore alignments do require reclamation for Trunk Road tunnel construction at the tie-in to CRIII to the west of the HKCEC Extension, through the HKCEC water channel and along the Wan Chai shoreline to the east of the HKCEC Extension, as a minimum.

3.1.4 At the connection with CRIII, the Trunk Road tunnel structure will lie above seabed level. Then, as it passes over the MTR Tsuen Wan Line, the Trunk Road tunnel will rise above sea level. Therefore, at the western end of the WDII project area, the Trunk Road tunnel structure must be contained within reclamation.

3.1.5 From the high level crossing over the MTR tunnel, at the western end of the HKCEC water channel, even dropping at maximum gradient, the tunnel structure will be above sea level through the western part of the water channel, and will stay above seabed level through the eastern part of the water channel. The most practical engineering solution will be to construct the Trunk Road as a cut-and-cover tunnel after reclaiming the water body between the two seawalls of the Convention Centres.

3.1.6 The slip road connections in Wan Chai North (Slip Roads 1, 2 and 3) will also require reclamation as they rise above seabed level to their portals at ground level, in areas where this reclamation is not already formed for the mainline Trunk Road construction.

3.1.7 Moving further eastwards, the Trunk Road tunnel will only drop beneath the seabed at it nears the PCWA basin, and will therefore require reclamation for construction of cut-and-cover tunnel along the Wan Chai shoreline.

3.1.8 Then, to the east of the CBTS, the Trunk Road needs to connect to the existing elevated IEC road structure at a road level around +15mPD. This means that any Trunk Road tunnel running under the seabed (even if deep enough not to require reclamation) must, at some point or another, rise above the seabed to a tunnel portal at ground level before rising onto elevated road structure to connect to the IEC. As the tunnel rises to and

above the seabed, reclamation will be required for cut-and-cover tunnel construction, and reclamation will be required for the ground level tunnel portal construction.

3.1.9 The connecting constraints mean that all schemes for the Trunk Road alignment through the WDII project area will require some reclamation at least at the western end for all Trunk Road schemes and at the eastern end for tunnel schemes. In addition, the feasible foreshore alignments will also require reclamation for cut-and-cover tunnel construction though the HKCEC water channel and along the Wan Chai shoreline to the east of the HKCEC Extension. There is, therefore, no possible "no-reclamation" alignment option for the Trunk Road through the WDII area.

3.1.10 The following paragraphs examine the unavoidable reclamation requirements in more detail, and investigate other ideas that have been suggested in pursuit of no-reclamation alignments.

3.2 MTR Tsuen Wan Line Crossing

3.2.1 After the connection with the CWB tunnel in the CRIII area, the Trunk Road will have to cross the MTR Tsuen Wan Line tunnel. As noted in para 2.1.10, the Trunk Road must not impose any loads on, or cause any significant movement of, this existing MTR immersed tube tunnel.

3.2.2 Piled deck structure over the MTR tunnel is a feasible solution that will meet these conditions. A proposed scheme for this tunnel crossing, developed and agreed in consultation with MTRC to meet their statutory limitations on allowable surcharge, lateral pressure and movement, involves the construction of a row of bored piles along either side of the Tsuen Wan Line tunnel with precast tunnel sections supported by these piles for the Trunk Road tunnel which spans over the MTR tunnel. Details of the scheme, extracted from the detailed engineering design of the MTR tunnel crossing, are shown in **Figure 3.1**. For this scheme, the Trunk Road will cross over the MTR tunnel at a road level of around –6.5mPD and, with the height of the tunnel structure being approximately 9m from road level, a top of tunnel structure level of around +2.5mPD.

3.2.3 Reclamation is required for the adjacent cut-and-cover tunnels that tie into the precast tunnel sections over the MTR tunnel, as these are above seabed level. Moreover, the Trunk Road tunnel structure would be above sea level (even above high tide level: mean higher high water level is +2.0mPD) at this crossing point, and this would effectively be regarded as reclamation, anyway.

3.2.4 Tunnelling under the MTR Tsuen Wan Line has been suggested as a means of eliminating the reclamation for the crossing over the MTR tunnel. This would need to be at sufficient depth to avoid disturbance to the existing ground and movement of the MTR tunnel. The constraints in this case are: (i) the Trunk Road tunnel connection back to existing road links at the Central Interchange, and (ii) the slip road connections to the ground level road network in Wan Chai North. Neither can be achieved for a deep Trunk Road tunnel beneath the MTR tunnel due to gradient limitations.

3.2.5 To illustrate this vertical alignment constraint, **Figure 3.2** shows a deep tunnel alignment where the Trunk Road drops down from the tie-in with the Central Interchange at Central Reclamation Phase I (CRI) at the maximum permissible tunnel gradient to pass beneath the MTR Tsuen Wan Line.

3.2.6 The location of the Trunk Road tunnel western portal at CRI is fixed by the connection of the mainline Trunk Road to the Rumsey Street Flyover, which has already been constructed, and by slip road connections at the Central Interchange that must tie into existing roads in Central. Moving the portal further west, in order to provide a longer Trunk Road tunnel length over which the deep tunnel can drop to a lower level when it passes beneath the MTR tunnel, will mean that the mainline Trunk Road and slip road connections at the Central Interchange cannot be made as the road alignments will exceed maximum permissible gradients and cannot comply with highway design standards in respect of road geometry. The location of the western portal of the Trunk Road, therefore, cannot be moved.

3.2.7 With the western portal of the Trunk Road being fixed, and the Trunk Road vertical alignment dropping at the maximum permissible gradient to pass under the MTR tunnel, Figure 3.2 illustrates the consequences in respect of clearance between the MTR immersed tube tunnel and the Trunk Road bored tunnel. As can be seen in Figure 3.2, the clearance between the two tunnels only around 5m, whereas the Trunk Road bored tunnel diameter is around 15.5m. Clearance of around 1.5 to 2 times the bored tunnel diameter needs to be provided to keep disturbance of existing ground and movement of the MTR tunnel to within MTRC's statutory limits, so as to ensure that the MTR tunnel is not damaged. Clearly, the available clearance is totally inadequate.

3.2.8 Therefore, a deep Trunk Road tunnel passing beneath the MTR Tsuen Wan Line is not feasible. The Trunk Road must pass over the MTR tunnel, and reclamation associated with this crossing is unavoidable.

3.2.9 A feasible vertical profile of the Trunk Road tunnel from the western portal in CRI over the MTR Tsuen Wan Line is presented in **Figure 3.3**, which also indicates the reclamation required in WDII at the connection with CRIII and the crossing over the MTR tunnel, where the Trunk Road tunnel rises above seabed level. The determination of this vertical profile takes into account essential related infrastructure such as tunnel ventilation adits that pass over the Trunk Road tunnel structure, below ground level in the limited available space.

3.3 IEC Connection

3.3.1 At the eastern end of the WDII project area, all Trunk Road tunnel schemes need to rise to a ground level portal and then onto elevated road structure to connect with the existing elevated IEC at a level of around +15mPD. The tunnel will be constructed by cut-and-cover method as the Trunk Road rises to and above the seabed, and reclamation will be required where the tunnel rises above the seabed, up to the start of flyover structure.

3.3.2 **Figure 3.4** illustrates the minimum reclamation situation where a cut-and-cover tunnel rises up to ground level immediately to the east of the CBTS eastern breakwater. The

existing land formation in this area, which extends beyond the IEC structure into the harbour, can be put to good use to accommodate the Trunk Road tunnel so as to minimise the extent of new reclamation required. As shown in Figure 3.4, though, this existing area of land is not sufficient to encompass the Trunk Road tunnel and portal entirely; additional reclamation is required both in length and width.

3.3.3 The width of reclamation required to accommodate the Trunk Road tunnel is determined by the cross-sectional elements of the Trunk Road tunnel structure, which is located adjacent to the existing IEC foundation piles, and the wave absorbing seawall alongside the tunnel structure. As illustrated in Figure 3.4, the existing width of the formed land is insufficient to accommodate the Trunk Road tunnel structure and its protecting seawall, and an additional width of reclamation, of around 40m, is required.

3.3.4 The length of reclamation at this connection to the IEC is determined by the maximum gradient of the tunnel as it rises from seabed level to the tunnel portal at ground level, with reclamation continuing to just beyond the flyover abutment, to the point at which the flyover structure rises to a high enough level to span over the sea. As illustrated in Figure 3.4, an overall length of formed land of around 620m is needed, however the length of the existing formed land is only around 430m, therefore an additional length of reclamation, of around 190m, must be provided.

3.3.5 The resulting area of reclamation, around 4ha, is the minimum requirement for Trunk Road tunnel schemes rising up to connect to the existing IEC.

3.4 Deep Tunnel Option

3.4.1 A deep bored tunnel option for the Trunk Road has been examined with a view to avoiding reclamation. The idea being that a tunnel constructed by tunnel boring machine (TBM) at sufficient depth below the surface would not require reclamation and can be constructed without disturbing existing facilities and infrastructure.

3.4.2 However, at the western end of WDII, at the connection with the Trunk Road tunnel constructed under CRIII and for the crossing over the MTR Tsuen Wan line, the deep tunnel option must start off as shallow cut-and-cover tunnel, in reclamation, similar to all other Trunk Road options. The Trunk Road then stays in cut-and-cover tunnel through the HKCEC water channel and along the Wan Chai shoreline, until it drops down low enough beneath the seabed to change to bored tunnel.

3.4.3 The Trunk Road bored tunnel then passes beneath the existing CHT and beneath the proposed SCL tunnels, at a level of around –50mPD in order to provide adequate clearance between the tunnels, before rising up along the North Point shoreline to connect with the existing elevated IEC. Rising from this depth, even at maximum tunnel gradient, means that the connection with the IEC can only be made at around the location of the North Point ferry piers. As the tunnel rises towards the seabed, and ground cover becomes insufficient for the TBM construction, the form of construction needs to change to cut-and-cover tunnel, with associated reclamation to facilitate this construction along the North Point shoreline.

3.4.4 Therefore, bored tunnel would only be possible through the central portion of the Trunk Road in WDII (under the CHT, under the CBTS and immediately to the east of the CBTS). At the HKCEC and along the Wan Chai shoreline, and along the North Point shoreline for the connection with the IEC, the Trunk Road would be cut-and-cover tunnel, in reclamation. **Figure 3.5** shows the deep tunnel option layout and profile.

3.4.5 Two of the major issues associated with this deep tunnel option are:

(i) The longer length of the Trunk Road cut-and-cover tunnel along the North Point shoreline, all the way to the connection with the IEC at the North Point ferry piers, results in extensive reclamation along this part of the shoreline.

(ii) Slip Road 8 (from Victoria Park Road to Trunk Road westbound) cannot join the mainline Trunk Road tunnel in Causeway Bay, as a connection from the ground level Victoria Park Road to the bored tunnel at this deep level will exceed maximum permissible tunnel gradients.

3.4.6 Omitting Slip Road 8 for the deep tunnel option means that this scheme will not meet all the functional requirements of the Trunk Road and, as such, the deep tunnel option does not perform as well as other tunnel options that can meet the functional requirements.

3.4.7 However, it is the issue of reclamation, and whether it is unnecessarily extensive, that is the key concern in this instance, particularly in light of the CFA ruling on reclamation in relation to the PHO, which requires the minimisation of reclamation when examining alternatives for the Trunk Road.

Extent of Reclamation for the Deep Tunnel Option

3.4.8 As noted above, reclamation will be required at the connection with CRIII, through the HKCEC water channel and along the Wan Chai shoreline. This area of reclamation is, in fact, common to all Trunk Road schemes. Reclamation is not required through the CBTS for the deep tunnel option, but is also not required for the permanent works of alternative cut-and-cover tunnel options, where these lie beneath the seabed of the CBTS.

3.4.9 The area of concern when comparing the deep tunnel option against other tunnel options is along the North Point shoreline, where the deep tunnel rises towards the seabed and, as the ground cover to the tunnel reduces, the form of construction needs to change from bored tunnel to cut-and-cover tunnel (in reclamation).

3.4.10 The more extensive reclamation along the North Point shoreline is not in itself a technical problem, but, when examining feasible and acceptable schemes, the need to minimise reclamation and, where reclamation is required, to fully justify its extent, is an essential aspect of this project. If there are feasible alternatives that require a lesser extent of reclamation, they should be pursued instead.

3.4.11 **Figure 3.6** shows the layout of the deep bored tunnel option in the area along the North Point shoreline, where it rises up to connect with the elevated IEC, and the extent of reclamation required in this area for the scheme.

3.4.12 **Figure 3.7** shows the layout and extent of reclamation of an alternative cut-and-cover tunnel option (as referenced in Section 3.3 above) which rises to connect to the IEC outside the CBTS. The more westerly connection with the IEC for this option, immediately outside the CBTS rather than at the North Point Ferry Piers, is made possible by the shallower depth of the cut-and-cover Trunk Road tunnel through the typhoon shelter, where it lies below the seabed level but not at the deep level required for bored tunnel construction. The lesser extent of reclamation is due in part to the higher seabed level through the typhoon shelter compared to the seabed level along the North Point shoreline (the alternative cut-and-cover tunnel therefore having less length of tunnel structure above the seabed, requiring reclamation).

3.4.13 In examining the extent of reclamation, it can be seen from Figure 3.7 that the alternative cut-and-cover tunnel scheme can make good use of the existing land beneath and along the north side of the IEC, in the area immediately to the east of the typhoon shelter. As a result, this scheme requires a lesser extent of reclamation than the deep tunnel option which requires a wider and therefore greater area of reclamation due to the more set-back shoreline at the North Point ferry piers.

3.4.14 Measurement of the extent of reclamation along the North Point shoreline for these two tunnel options indicates that their approximate reclamation areas are:

- deep tunnel option, 14ha
- alternative tunnel option, 4ha.

3.4.15 In short, the deep bored tunnel option requires a greater area of reclamation along the North Point shoreline than the alternative cut-and-cover tunnel option. Moreover, the deep bored tunnel option cannot perform as well as the alternative cut-and-cover tunnel option, due to its deficiency in providing the Slip Road 8 connection.

3.4.16 The reclamation required for the deep tunnel option appears unnecessarily extensive; in the light of the CFA ruling, it must be concluded that, as the deep tunnel option will result in a greater area of reclamation than an alternative available tunnel option, and as in any event the deep tunnel option does not perform as well as the alternative cut-and-cover tunnel option, there is no justification or overriding need to continue to pursue this deep tunnel option.

3.5 Alternative Trunk Road Tunnel Ideas

3.5.1 Alternative Trunk Road and harbour-front enhancement ideas have been submitted by members of the public during the course of the Envisioning Stage consultation, with a view to minimising reclamation and improving the waterfront. Two proposals in particular warrant attention: one from Swire Properties ("A Proposal for the Wan Chai - Causeway Bay Shoreline" submitted to the Sub-committee on WDII Review in July 2005), and another from RHKYC ("Preserving the Vibrancy and Diversity of Victoria Harbour" submitted to the Sub-committee on WDII Review in July 2005).

3.5.2 An extract from the Swire's proposal is shown in **Figure 3.8**. Swire's submitted their proposal to demonstrate an idea that would allow Victoria Park unfettered access to the

waterfront. As can be seen from Figure 3.8, their scheme involves Trunk Road tunnel construction that does require reclamation along the Wan Chai shoreline and in the corners of the CBTS. This is therefore not a "no-reclamation" idea.

3.5.3 An extract from the RHKYC proposal is shown in **Figure 3.9**. RHKYC noted that they had brainstormed with and solicited ideas from various stakeholders including Wan Chai District Council and Eastern District Council, NGOs, sports associations and RHKYC members, in deriving their proposal. As can be seen from Figure 3.9, reclamation will be needed for Trunk Road tunnel construction along the Wan Chai shoreline and in the corners of the CBTS for the RHKYC scheme. This scheme is therefore also not a "no-reclamation" idea.

3.6 Double Decking over Gloucester Road

3.6.1 A member of the public has proposed a double-decking idea, which involves the construction of an elevated Trunk Road structure above the existing Connaught Road Central / Harcourt Road / Gloucester Road. The idea being to make use of the air space above the existing road corridor for Trunk Road construction.

3.6.2 Connection to Connaught Road Central is proposed through a multi-storey car park building at Rumsey Street or Shun Tak Centre. Leaving aside for now the practicality of having Trunk Road traffic circulating up and down through a car park building to access or exit the Trunk Road, and the road network connectivity requirements in Central, constructing a bridge deck or flyover over the length of Gloucester Road, in the WDII project area, is not feasible.

3.6.3 If flyovers are constructed above existing roadways, there must be space for the bridge piers and foundations. The Trunk Road is a dual 3-lane carriageway with an overall elevated deck width of around 30m. This will need to span clear across the existing Gloucester Road, including access flyovers such as Tonnochy Road Flyover and Arsenal Street Flyover, and keep clear of the numerous pedestrian bridges that currently span over Gloucester Road.

3.6.4 A portal support structure for the Trunk Road will be required. **Figure 3.10** illustrates the arrangement at two of the critical sections along Gloucester Road. As can be seen, an extremely bulky structure will be required that will result in the loss of existing traffic lanes in both the east-bound and west-bound carriageways of Gloucester Road. Moreover, the structure will be very high, in order to pass over the existing elevated structures along Gloucester Road (Trunk Road level would be at around +23mPD, ie at around the 5^{th} or 6^{th} floor level of the adjacent buildings along Gloucester Road). Visual impacts and the blocking effects of the double-deck structure will be severe.

3.6.5 Traffic impacts are of primary concern when considering the feasibility of this double-deck idea. During construction, two lanes on Gloucester Road will need to be closed in both east-bound and west-bound directions to allow for the portal frame construction and contractor's working space. With the Gloucester Road corridor already filled to capacity with roads, there is no spare road space for temporary traffic diversions. Then, once the Trunk Road is complete, there will be a permanent loss of one lane in both directions.

3.6.6 The consequence will be a loss of around 30% to 40% of road capacity in both directions during construction and a permanent loss of around 25% of road capacity in both directions after construction. This loss of road capacity, from a major strategic road corridor that is already operating over capacity and will continue to operate at or near capacity even after the implementation of the Trunk Road, cannot be tolerated.

3.6.7 From both visual and traffic impacts points of view, the suggested double-deck arrangement along Gloucester Road is considered to be not feasible. Similar conclusions can be readily drawn for double-decking along Connaught Road Central and Harcourt Road.

3.7 Full Flyover Idea

3.7.1 It has been suggested by a member of the Sub-committee on WDII Review that a Trunk Road in the form of flyover starting from CRIII project boundary all the way to the connection with the IEC should be presented for consideration by the public. This suggestion is in respect of new land formation not being required for flyover, putting aside the question of whether the bridge piers in the harbour would constitute reclamation.

3.7.2 The major obstacle for a Trunk Road in the form of flyover starting from the CRIII project boundary is the existing development in Wan Chai North, in particular, the HKCEC Phase I and the HKCEC Extension, and their connecting Atrium Link bridge, which form a physical barrier to elevated road structures (as discussed in Section 2). Full flyover options cannot rise to a high enough level to pass over the HKCEC and/or the Atrium Link (para 2.5.1).

3.7.3 Referring to Section 2.6, all Trunk Road alignments must pass through the HKCEC water channel in tunnel, in reclamation. Only after passing through the water channel can the Trunk road rise up onto flyover, therefore a so-called “full flyover” option (having no new land formation) is not possible.

3.8 Total Offshore Idea

3.8.1 Following on from the full flyover idea above, an idea of having the Trunk Road alignment completely offshore (ie not constrained by the connecting point with CRIII to the west of the HKCEC) has been considered.

3.8.2 A flyover running through the middle of the harbour would clearly be unacceptable, due to marine impacts: pleasure, ferry and commercial shipping would be affected.

3.8.3 A Trunk Road tunnel running offshore will be constrained by the crossing beneath the MTR Tsuen Wan Line and the CHT. Similar to the case for a deep tunnel described in Section 3.2, a Trunk Road alignment that turns northwards into to the harbour from the connection with the Central Interchange in CRI will not be able to drop down deep enough to pass beneath the MTR immersed tube tunnel with sufficient clearance.

3.8.4 Therefore, “total offshore” ideas for the Trunk Road alignment are not feasible.

3.9 Quasi No-Reclamation Idea

3.9.1 Another suggestion from a member of the Sub-committee on WDII Review is that, even if the top of the Trunk Road tunnel structure is above the existing seabed level, as long as the top of structure is below sea level, this should be presented as an alternative choice instead of constructing the tunnel in reclamation. The preference being that even a shallow water area should be returned to the harbour.

3.9.2 **Figures 3.11** and **3.12** show the alternative arrangement for a Trunk Road tunnel option at Wan Chai and North Point respectively, if a minimum of 1m of water depth is provided above the tunnel protection layer at mean low water level.

3.9.3 This shallow water depth is inadequate for navigation access by the range of vessels (pleasure craft and ferries) that would require access to the waterfront. In particular, the Wan Chai North cross harbour ferry services would be compromised and there would be no access to landing steps along the existing seawalls.

3.9.4 Furthermore, the Trunk Road tunnel structure would be exposed to damage from ship impact, including ocean going vessels in the nearby navigation fairways (and the consequences of structural damage to the road tunnel would be severe). Protection in the form of a rubble mound bund, or breakwater, would be required, as shown in Figures 3.11 and 3.12.

3.9.5 As a result, the perceived benefits of "seeing a water surface" along the shoreline rather than reclamation are offset by the reclamation formed by the offshore protective breakwaters. This "quasi no-reclamation", or "shallow water", Trunk Road idea:

- nevertheless has a tunnel structure above seabed level that constitutes reclamation under the PHO;
- results in additional reclamation for the protective breakwaters;
- compromises marine access to the waterfront, including essential ferry services;
- results in reclamation that cannot be put to use for harbour-front enhancement.

3.9.6 The areas of reclamation of this "quasi no-reclamation", or "shallow water", idea, can be compared with the saving in land formation along the shoreline that would otherwise be required under the conventional approach of having cut-and-cover tunnel in reclamation. This could be viewed as 'water area saved', as shown in Figures 3.11 and 3.12, and is the area of land (reclamation) that is not required if the tunnel structure were to be left unprotected below sea level, albeit offset against the reclamation areas of the protective breakwaters and the reclamation areas of the tunnel structure above seabed level.

3.9.7 When examining the areas of reclamation of the "shallow water idea" and the conventional approach having cut-and-cover tunnel in reclamation, the following observations are made:

Location	"Shallow Water Idea"		Offset against conventional approach of cut-and-cover tunnel in reclamation
	Reclamation for Protective Breakwaters	Area of tunnel structure above seabed (= 'reclamation')	Water Area Saved (area of land formation not required if "shallow water idea" is implemented)
Wan Chai	2.5ha	1.5ha	4.5ha
North Point	0.7ha	0.2ha	0.5ha

3.9.8 In view of the above concerns/issues, and without any material benefit in terms of real reduction of reclamation, the "quasi no-reclamation" idea with the provision of shallow water above the Trunk Road tunnel structure is not considered a practical or reasonable idea to be pursued.

3.10 Conclusion of the Review of No-Reclamation Alignments

3.10.1 All suggested alignments for the Trunk Road, and forms of construction, have been examined with a view to determining if there are any that do not require any reclamation for the Trunk Road construction.

3.10.2 It is concluded that there are no "no-reclamation" alignments for the Trunk Road, and even offshore or inland alignments are not feasible. Consequently, it must be accepted that at least some reclamation will be required for Trunk Road construction.

4 TRUNK ROAD FORM OF CONSTRUCTION

4.1 Introduction

4.1.1 In reviewing Trunk Road tunnel options, cut-and-cover tunnel construction is considered to be a technically feasible form of construction for implementation of the Trunk Road. Determination of the practicable and feasible form of tunnel construction has taken into account alternative construction methods that may be considered appropriate along the different sections of the WDII project area. Possible variations of Trunk Road cut-and-cover tunnel are examined, with a view to determining practically feasible tunnel ideas that can be consolidated with harbour-front enhancement ideas for carrying forward to the Realization Stage of this project.

4.1.2 There is broad support from the public for a tunnel option, especially where this can incorporate suggested harbour-front enhancement ideas while at the same time provide for the functional requirements of the Trunk Road. However, a flyover option is also technically feasible. Notwithstanding that there appears to be little public support for a flyover option, it is the opinion of the Sub-committee on WDII Review that this option should be given further consideration insofar as it does represent a scheme requiring a lesser area of new land formation. At issue is which option, tunnel or flyover, would comply with the PHO. Accordingly, this section also examines a possible Trunk Road flyover idea and compares it with the Trunk Road in tunnel.

4.1.3 The possible Trunk Road option arising from these investigations is also examined in respect of flexibility for future submerging of the IEC. The intention being that any Trunk Road scheme that is proposed now will not inhibit such a possibility, for longer term planning for the enhancement of the harbour-front, albeit that this may not arise in the foreseeable future and would need to be justified by relevant social, environmental and economic considerations.

4.2 Alternative Tunnel Construction Methods

4.2.1 As described previously, the Trunk Road crossing over the MTR tunnel, at the western end of the HKCEC water channel, and the shallow tunnel (above seabed level) passing through the HKCEC water channel, means that the most practical construction approach in this area will be to construct the Trunk Road as a cut-and-cover tunnel after reclamation along the shoreline to the west of the HKCEC and the water body between the two seawalls of the Convention Centres. This reclamation will also accommodate the slip road connections in Wan Chai North.

4.2.2 Along the Wan Chai shoreline, the Trunk Road tunnel remains above the seabed level, therefore, again, cut-and-cover tunnel constructed in reclamation is considered the appropriate form of construction in this area.

4.2.3 Immersed tube tunnel form of construction may be used where the tunnel lies just below seabed level; reclamation would not be required for this form of tunnel construction. However, this form of construction is not suitable where the tunnel level rises above

seabed level, as the exposed tunnel section would then be at risk of damage from ship impact, anchors, etc, the tunnel structure would be more susceptible to degradation in an aggressive marine environment, and the protrusion of the tunnel structure above the seabed would restrict marine access to the shoreline. Also, even where the tunnel lies below seabed level, the soft seabed material would need to be excavated so that the immersed tube units lie in a trench on a firm foundation. Along the Wan Chai shoreline, this would involve excavating a deep trench immediately adjacent to the existing seawalls, which would undermine these seawalls. Use of immersed tube is therefore considered not feasible in this instance, and the most practical and reasonable form of construction for the Trunk Road tunnel along the Wan Chai shoreline is cut-and-cover, constructed through reclaimed land.

4.2.4 Through the PCWA basin and the CBTS, where the Trunk Road tunnel lies below seabed level, immersed tube or cut-and-cover tunnel construction may be considered. In this case, for cut-and-cover tunnel, temporary reclamation formed to facilitate the tunnel construction can be removed on completion of construction, so that the finished product, ie retention of the existing seabed condition, is the same for both methods. Factors to be considered include: whether the tunnel alignment runs wholly through seabed or partly in existing seabed and partly under existing seawalls and land formation, the latter making cut-and-cover construction more practically feasible (more efficient and cost effective construction with less disruption to existing shoreline facilities and infrastructure) than use of precast immersed tunnel sections that need to be placed in open trenches; the depth of the tunnel (where the tunnel lies at a significant depth below the seabed, for example near the CHT crossing, at –30mPD, major deep and wide trenches will need to be excavated, making immersed tube construction more disruptive with greater impacts); or the tunnel length available for immersed tube construction (short lengths will not be cost effective for the precast fabrication of tunnel units). The form of tunnel construction is an important consideration in respect of avoiding conflict with the SCL, as Trunk Road cut-and-cover tunnel can be constructed across the future SCL alignment with much closer separation allowance. Because the Trunk Road tunnel is on diaphragm wall (piled) supports, it will not be structurally adversely affected by the construction of the SCL tunnels.

4.2.5 Where the Trunk Road tunnel rises up above the seabed to ground level, for the connection with the IEC at the eastern end of the CBTS, cut-and-cover tunnel in reclamation will again be the feasible form of construction.

4.2.6 Deep bored tunnel construction has also been examined (see Section 3.4), but is not recommended due to reduced traffic performance and the need for a larger area of reclamation along the North Point shoreline.

4.2.7 In summary, cut-and-cover tunnel construction is considered to be the practical and feasible form of construction for implementation of the Trunk Road through the HKCEC water channel, along the Wan Chai shoreline and through the CBTS. Permanent reclamation will be required at the HKCEC, along the Wan Chai shoreline and at the eastern end of the CBTS, for the cut-and-cover tunnel, where it lies above the seabed level.

4.3 Trunk Road Tunnel Variations

Trunk Road Tunnel Variation 1

4.3.1 Examination of possible Trunk Road tunnel options leads first to Trunk Road Tunnel Variation 1, shown conceptually in **Figure 4.1**. In this tunnel option, the Trunk Road starts off at the connection with CRIII in cut-and-cover tunnel, crosses over the MTR Tsuen Wan Line tunnel and continues through the HKCEC water channel and along the Wan Chai shoreline, in cut-and-cover tunnel, in reclamation.

4.3.2 The Trunk Road tunnel passes beneath the CHT portal at a level of around –30mPD; this depth is required in order to avoid conflict with the existing rock anchors of the CHT portal structure. The low level of the Trunk Road tunnel means that the tunnel structure lies entirely below the seabed level of the PCWA basin and the CBTS, only rising up above seabed level to ground level to the east of the CBTS, where the Trunk Road then rises up to connect with the existing elevated IEC. Permanent reclamation in the PCWA basin and in the CBTS is not essential. While temporary works will be required (which may include temporary land formation for tunnel construction purposes) these can be removed afterwards and the existing seabed and water area reinstated.

4.3.3 Connection to the IEC is made to the northern side of the existing IEC elevated road structure, which is considered to be the least disruptive form of connection. The existing IEC links back into Causeway Bay (to Victoria Park Road and Hing Fat Street) are retained.

4.3.4 Looking beyond the Trunk Road itself to the need and opportunities for harbour-front enhancement, combining harbour-front enhancement with the functional elements of the Trunk Road leads to a consolidated conceptual scheme, that can be used as the basis for the development of a Concept Plan for the harbour-front under the WDII project. An indicative illustration of what the Consolidated Harbour-Front and Trunk Road Tunnel (Variation 1) scheme might look like, after some broad landscape treatment, is shown in **Figure 4.2**. Further details of this consolidated scheme and associated waterfront opportunities are discussed in the following Section 5.

Trunk Road Tunnel Variation 2

4.3.5 A further variation of the Trunk Road tunnel idea is derived by taking on board one of the written submissions from the public, shown earlier in **Figure 3.8**. One of the major features of this submission is the reconstruction of Victoria Park Road further to the south (within the existing Victoria Park) so as to free up more waterfront space along the southern edge of the CBTS. A landscaped deck is provided over the ground level roads to extend Victoria Park to the waterfront. The Trunk Road tunnel is also aligned further south to connect directly into the IEC at the eastern side of the CBTS, with the existing IEC connections to Victoria Park Road reconstructed as tunnel through the south-eastern corner of the typhoon shelter.

4.3.6 Although 'conceptually correct', the submission does need to be more fully developed with the incorporation of a 'functionally correct' Trunk Road layout, leading to 'Trunk Road Tunnel Variation 2'.

4.3.7 To turn the written submission as shown in Figure 3.8 into a functional Trunk Road option, the following factors affecting the configuration of the Trunk Road and its layout need to be considered, with the road layout adjusted as necessary to meet the functional and safety requirements of the Transport Planning & Design Manual (TPDM):

(i) Trunk Road lane configuration: traffic demand requires a dual 3-lane configuration for the mainline generally, while merging and weaving constraints mean that there will need to be some localised widening to accommodate the entry of slip roads as separate lanes.

(ii) Cross-sectional tunnel dimensions: the correct width of Trunk Road tunnel structure must be allowed for, including allowance for lane configuration, road shoulders, tunnel structure, etc.

(iii) Conflict with the rock anchors at the CHT portal: the tunnel must be pulled back (southwards) to go around the anchorage zone, so as to avoid the conflict.

(iv) Slip Road 8: provision needs to be made for this slip road which caters for traffic from the Causeway Bay and Tin Hau area entering the westbound Trunk Road, going to Central and western Hong Kong Island. However, an eastbound slip road for traffic exiting the Trunk Road in this area, as indicated in the written submission, is not essential and therefore does not need to be provided.

(v) Road design standards: highway design standards for the Trunk Road as well as for the proposed reconstruction of Causeway Bay Flyover and Gloucester Road Flyover, including adequate headroom clearances, must be incorporated in the road layout.

4.3.8 The resulting road layout for Trunk Road Tunnel Variation 2 is illustrated in **Figure 4.3**.

4.3.9 Similar to the case for Trunk Road Variation 1 above, harbour-front enhancement is combined with the functional elements of the Trunk Road to give a consolidated conceptual scheme. **Figure 4.4** gives an indicative illustration of what the Consolidated Harbour-Front and Trunk Road Tunnel (Variation 2) scheme might look like, after some broad landscape treatment.

Trunk Road Tunnel Variation 3

4.3.10 The inland diversion of the alignment in Trunk Road Tunnel Variation 2 to avoid conflict with the rock anchors at the CHT approach ramp structure introduces reverse curves in the road tunnel. Reverse curves in a major highway tunnel are not appropriate. Even where minimum highway design standards can be met, the abrupt changes in curvature and super-elevation will lead to a sudden change in steering attitude of a vehicle negotiating these curves, which could take drivers by surprise. Moreover, vehicles slowing to negotiate the reverse curves will also reduce the traffic performance of the entire Trunk Road. This is an undesirable situation and, especially in tunnels, leads to safety concerns. Situations where vehicles need to slow to negotiate changes in

road alignment, especially where drivers may be caught unaware, create the potential for accidents; the more so where, in tunnels, following vehicles cannot change lanes to avoid vehicles in front of them. The consequences of accidents in tunnels are far more severe than open road situations. As such, these reverse curves should be avoided if at all possible.

4.3.11 Instead of pulling back the tunnel to go around the anchorage zone, conflict with the CHT rock anchors could also be avoided by straightening up the Trunk Road alignment at the CHT, and having the tunnel pass beneath the CHT portal rock anchor zone, similar to the Trunk Road Tunnel Variation 1. By so doing, the alignment concerns of Tunnel Variation 2, expressed above, can be overcome.

4.3.12 **Figure 4.5** shows the resulting Trunk Road Tunnel Variation 3 road layout.

4.3.13 Core features of Tunnel Variation 2 (and the public submission from which this has been derived) are retained in Tunnel Variation 3. These include the idea of reconstructing Victoria Park Road further to the south to free up more waterfront space and the construction of a landscaped deck over the ground level roads to extend Victoria Park to the waterfront, as well as the reconstruction of the existing IEC connections to Victoria Park Road as tunnel through the south-eastern corner of the typhoon shelter. The direct connection of the Trunk Road to the IEC at the eastern end of the CBTS is also retained.

4.3.14 The difference between these two Trunk Road tunnel variations in terms of harbour-front enhancement is simply the lesser extent of reclamation in the CBTS, with Trunk Road Tunnel Variation 3 not having any reclamation at the south-western corner of the typhoon shelter.

4.3.15 Again, combining harbour-front enhancement with the functional elements of the Trunk Road gives a consolidated conceptual scheme. **Figure 4.6** gives an indicative illustration of what the Consolidated Harbour-Front and Trunk Road Tunnel (Variation 3) scheme might look like, after some broad landscape treatment. This scheme is similar to that of Trunk Road Tunnel (Variation 2), except that in this case there would be no change to the existing situation for the promenade in the south-western corner of the CBTS.

4.4 Major Issues of the Trunk Road Tunnel Variations

4.4.1 Examination of the land use, engineering and environmental aspects of the design and construction of the Trunk Road tunnel variations leads to the following issues that are highlighted as being of particular concern:

- more reclamation due to filling in of the corners of the CBTS (south-east and south-west corners for Variation 2, south-east corner for Variation 3);
- major road diversions and traffic impacts during construction (particularly for Variations 2 and 3);
- intrusion into and demolition of Victoria Park for the construction of the realigned Victoria Park Road (both Variations 2 and 3);

- need for the reconstruction of major existing highway structures, including the IEC, Gloucester Road Flyover and the newly constructed Causeway Bay Flyover (both Variations 2 and 3);
- demolition of the Police Officers' Club (Variation 2);
- air quality concern at the tunnel portal, due to close proximity of residential units (all tunnel variations, but more so for Variations 2 and 3).

Area of Reclamation

4.4.2 All the Trunk Road tunnel variations (Variations 1, 2 and 3) require reclamation along the North Point shoreline for cut-and-cover tunnel and tunnel portal construction. However, Tunnel Variations 2 and 3 also result in reclamation in one or more of the corners of the CBTS, which is not required for the Trunk Road Tunnel Variation 1.

4.4.3 Tunnel Variation 2 requires reclamation in the south-western corner of the typhoon shelter for shallow cut-and-cover Trunk Road tunnel construction, and in the south-eastern corner of the typhoon shelter for reconstruction of the IEC and the Victoria Park Road connections in tunnel. Tunnel Variation 3 requires reclamation in the south-eastern corner of the typhoon shelter for reconstruction of the IEC and the Victoria Park Road connections in tunnel.

4.4.4 These additional areas of reclamation will need to be justified in meeting the 'overriding public need test' as required by the CFA ruling on the PHO, bearing in mind that an alternative Trunk Road tunnel option is available that does not require these more extensive areas of reclamation.

Road Diversions and Traffic Impacts

4.4.5 Construction of cut-and-cover tunnel across the entrance to the CHT for Trunk Road Tunnel Variation 2 will require major traffic diversions and result in severe disruption at the CHT portal and approach roads area, affecting both northbound and southbound CHT traffic. With the roads in this area already operating well over capacity, major traffic diversions in this area would quite likely result in a gridlock situation during peak hours, for both the Hong Kong Island-bound traffic and the Kowloon-bound traffic. The CHT is an extremely important strategic network link, and gridlock here would have far-reaching effects; this situation is considered intolerable.

4.4.6 Instead, with the Trunk Road passing beneath the CHT portal rather than across the entrance to the CHT, for Trunk Road Tunnel Variations 1 and 3, traffic diversions and disruption at the CHT portal area are avoided.

4.4.7 Extensive temporary road diversions will also be required to facilitate the tie-in to the IEC and the demolition of a considerable length of the existing IEC along the North Point shoreline, for Tunnel Variations 2 and 3. The existing IEC will, in effect, need to be reconstructed as a new (albeit temporary) road of similar proportions to the existing, from the Tong Shui Road interchange to Victoria Park Road. Victoria Park Road and Gloucester Road will also require extensive road diversions for their reconstruction.

4.4.8 These road diversions will inevitably result in traffic impacts and severe disruption to traffic flows. In particular, traffic diversion 'black spots' would be expected at the Tong Shui Road interchange on the IEC, at Victoria Park Road / Hing Fat Street junctions and at the Victoria Park Road / Gloucester Road interface area (including Gloucester Road northbound and Inner Gloucester Road). And, as noted in para 4.4.5 above, Tunnel Variation 2 will also have a traffic diversion black spot at the CHT.

4.4.9 **Figure 4.7** illustrates schematically the areas of major road diversions and the expected traffic diversion black spots for Tunnel Variations 2 and 3. Figure 4.6 also shows the comparative case for the Trunk Road Tunnel Variation 1. As can be seen, the extent of temporary road diversions is very much less for Trunk Road Tunnel Variation 1 and, with the IEC road diversions not intruding into the Tong Shui Road interchange and with the existing IEC connections through to Victoria Park Road being retained, and no reconstruction of Victoria Park Road and the Gloucester Road and Causeway Bay flyovers, there are no particular traffic diversion black spots.

Demolition of Victoria Park

4.4.10 For both Tunnel Variations 2 and 3, the existing Victoria Park Road will be realigned further southwards (inland) to allow more area along the Causeway Bay promenade for an extension of Victoria Park to the harbour-front promenade. These new roads will intrude into the entire northern part of the park and construction of the new roads will require the demolition and reconstruction of this northern part of Victoria Park. In particular, the entire existing raised 'knoll' area in the north-western part of the park will need to be demolished. **Figure 4.8** shows the extent of the intrusion into Victoria Park.

4.4.11 The construction works will cause severe disruption to park users and will remove a large part of the existing leisure area from public use for several years during the construction period. Whilst the new deck over the reconstructed Victoria Park Road will enable the extension of the park to the waterfront and, in terms of area, generally give back the existing area lost to road construction, the existing knoll area of the park is heavily wooded with large mature trees and these cannot be readily replaced on the new deck over Victoria Park Road.

Impacts on Existing Highway Structures

4.4.12 For both Tunnel Variations 2 and 3, the existing IEC (from Victoria Park Road to Tong Shui Road interchange outside City Garden in North Point) will need to be demolished and reconstructed as underpass and at-grade roads. The new Causeway Bay Flyover (currently under construction) and the existing Gloucester Road Flyover will also be demolished and reconstructed to suit the realigned Victoria Park Road layout.

4.4.13 Apart from the resulting traffic impacts due to this demolition of highway structures (as discussed above), there will be a major generation of public fill material to be disposed of and noise and air quality impacts to nearby residences during the demolition period.

4.4.14 In any event, the soundness of a decision to demolish existing road bridges (and especially, in the case of the Causeway Bay Flyover, where these have only recently been constructed) simply to reconstruct them 100m away, is debateable.

Demolition of Police Officers' Club

4.4.15 For Tunnel Variation 2, the Trunk Road alignment will pass beneath the Police Officers' Club (POC). Conflict with the POC foundations, and the cut-and-cover form of construction for this shallow tunnel, mean that the POC will need to be demolished.

Air Quality at the Tunnel Portal

4.4.16 Polluted air emissions from road tunnel portals is always a major concern, especially where there are nearby residential uses. The area of concern for all three tunnel variations is at the eastern tunnel portal at North Point, where there are existing residential buildings close to the shoreline. For Tunnel Variations 2 and 3, the Trunk Road tunnel portal will be located on the line of the existing IEC, in even closer proximity to the residential buildings than Tunnel Variation 1. In the case of Tunnel Variation 1, the portal is located to the north of the existing IEC highway structure, which will provide some shielding and buffer, and there is a greater separation between the tunnel portal and the residential units; there would therefore be a lesser degree of air quality impacts.

4.4.17 Although the acceptability or otherwise of the tunnel portal layout, from the environmental point of view, has yet to be determined, the potential adverse air quality impacts should be borne in mind when examining the appropriateness of these tunnel variation options.

4.5 Comparison of the Trunk Road Tunnel Variations

4.5.1 **Table 4.1** provides a comparison between the Trunk Road Tunnel Variations 1, 2 and 3, in broad terms, in respect of key indicators: area of reclamation, impacts to existing traffic, technical highway concerns and impacts to existing highway structures, impacts to existing development, planning and land use considerations, environmental concerns, time for construction and costs.

4.5.2 It should be noted that the areas of reclamation given in Table 4.1 are the areas of permanent reclamation, and include a notional allowance for reprovisioning requirements (for ferry pier, salt water pumping station, cooling water pumping stations, etc) associated with each of these tunnel variation options.

4.5.3 It should also be noted that there will be a requirement for temporary works (including temporary reclamation) to facilitate cut-and-cover tunnel construction and for temporary traffic diversions. These temporary works will be required in the PCWA basin and in the CBTS. In the CBTS, the extent of the temporary works, for all three tunnel variations, will be such that the existing moorings will need to be relocated outside the typhoon shelter during the construction period.

Table 4.1 Comparison of Trunk Road Tunnel Variations

	Tunnel Variation 1	Tunnel Variation 2	Tunnel Variation 3
Area of permanent reclamation	15 ha	18.5 ha	16.5 ha
Impact to existing traffic	• Some disruption at new tie-in to IEC	• Major disruption due to demolition of IEC and new tie-in to IEC • Major disruption due to reconstruction of Victoria Park Road, Causeway Bay Flyover and Gloucester Road Flyover • Major disruption at CHT approach roads due Trunk Road tunnel construction	• Major disruption due to demolition of IEC and new tie-in to IEC • Major disruption due to reconstruction of Victoria Park Road, Causeway Bay Flyover and Gloucester Road Flyover
Other technical concerns (impacts to highways structures, etc.)	• Localised reconstruction of existing IEC at City Garden for merging with the Trunk Road	• Reverse curves at the CHT area: undesirable for Trunk Road in tunnel • Reconstruction of Victoria Park Road and associated connections and Causeway Bay Flyover and Gloucester Road Flyover • Demolition of existing IEC from Victoria Park Road to City Garden	• Reconstruction of Victoria Park Road and associated connections and Causeway Bay Flyover and Gloucester Road Flyover • Demolition of existing IEC from Victoria Park Road to City Garden
Impacts to existing development	Existing development not affected	POC needs to be demolished	Existing development not affected

		Tunnel Variation 1	Tunnel Variation 2	Tunnel Variation 3
Planning and land use concerns	Along Wan Chai shoreline	Land formed can be used for harbour-front enhancement and pedestrian access to the waterfront	Land formed can be used for harbour-front enhancement and pedestrian access to the waterfront	Land formed can be used for harbour-front enhancement and pedestrian access to the waterfront
	PCWA basin	PCWA basin can be developed into a vibrant marine recreational facility	PCWA basin can be developed into a vibrant marine recreational facility	PCWA basin can be developed into a vibrant marine recreational facility
	Northern side of Victoria Park	Victoria Park can be extended to the harbour-front via a landscaped deck over the ground level roads	Victoria Park is reconstructed with a wide landscaped deck over the ground level roads, to a widened promenade	Victoria Park is reconstructed with a wide landscaped deck over the ground level roads, to a widened promenade
	CBTS	The existing CBTS is preserved as far as possible	Filling in the corners of the CBTS can be used for additional waterfront uses	Filling in the south-east corner of the CBTS can be used for additional waterfront uses
Environ-mental concerns	Noise & Air	• (Lesser) air quality concern at tunnel portal • Noise at tie-in to IEC (short 'new road' section)	• Air quality concern at tunnel portal • Noise along reconstructed IEC (long 'new road' section)	• Air quality concern at tunnel portal • Noise along reconstructed IEC (long 'new road' section)
	Water Quality	No major operational impacts due to the scheme	No major operational impacts due to the scheme	No major operational impacts due to the scheme
	Visual	No significant visual impacts	No significant visual impacts	No significant visual impacts
Time for construction		7 years	8 years	8 years
Costs *(incl WDII works & CWB in WDII)*	Total Construction	HK$20B	HK$28B	HK$25B
	Total Annual Recurrent	HK$110M	HK$125M	HK$123M

4.5.4 As can be seen, neither Tunnel Variation 2 nor 3 perform as well as the Trunk Road Tunnel Variation 1. The major issues associated with the Tunnel Variations 2 and 3 include additional reclamation due to filling in of the corners of the CBTS, major traffic disruption, demolition of a large part of Victoria Park, demolition and then reconstruction of major highway structures, and air quality concerns at the tunnel portal area in North Point. The reclamation issue is particularly important in respect of the PHO; the Trunk Road Tunnel Variation 1 requires a lesser extent of reclamation than that associated with the Tunnel Variations 2 and 3.

4.6 Trunk Road Flyover

4.6.1 **Figure 4.9** shows a Trunk Road flyover option. Same as for the tunnel option, the Trunk Road starts off at the connection with CRIII in cut-and-cover tunnel, crosses over the MTR Tsuen Wan Line tunnel and continues through the HKCEC water channel and along the Wan Chai shoreline, in cut-and-cover tunnel. Alignment constraints through the HKCEC water channel, including the HKCEC atrium link bridge and ground level road access, mean that the Trunk Road will need to stay in tunnel through the HKCEC water channel, only rising up to a tunnel portal along the Wan Chai shoreline. As for the case with tunnel options, reclamation is required along this part of the shoreline for Trunk Road construction.

4.6.2 The road then rises up onto elevated road structure to cross over the PCWA basin, then over Kellett Island (and the CHT portal), and stays on elevated structure to the connection with the existing IEC at the eastern side of the CBTS, at a level of around +14mPD. No permanent reclamation (land formation) is required in the PCWA basin, the CBTS or along the North Point shoreline.

4.6.3 The flyover alignment is kept to the south of the typhoon shelter to minimise physical intrusion into the mooring areas and disruption to the marine users. For this alignment, the new elevated road must tie directly into the IEC at the location of the Hing Fat Street slip roads, with new connections to Victoria Park Road replacing the existing elevated road through the south-eastern corner of the CBTS. The same slip road connections to the local road network in Wan Chai North and in Causeway Bay are provided as for the tunnel option, and the Trunk Road maintains the same overall dual 3-lane configuration.

4.6.4 The net extent of reclamation along the Wan Chai shoreline, which is shown indicatively in Figure 4.9, is considered the minimum for Trunk Road tunnel and portal construction, under the flyover option.

4.6.5 Harbour-front enhancement is somewhat more limited for the Trunk Road flyover option, and is essentially restricted to making use of the land formation along the Wan Chai shoreline. Even here, though, the new waterfront area is partly occupied by the tunnel portal which constrains the extent of leisure area. The PCWA basin cannot be properly used as a marine recreational facility due to the highway bridge piers occupying the water area and the low headroom clearance of the flyover. In Causeway Bay, the new elevated road running along the northern side of Victoria Park and the Causeway Bay promenade makes implementation of a landscaped deck over Victoria Park Road, for an extension of Victoria Park to the waterfront, impractical.

4.6.6 Nevertheless, harbour-front enhancement can be combined with the functional elements of the Trunk Road to give a consolidated conceptual scheme. Similar to the case for Trunk Road tunnel variations above, **Figure 4.10** gives an indicative illustration of what the Consolidated Harbour-Front and Trunk Road Flyover scheme might look like, after some broad landscape treatment.

Comparison of Tunnel and Flyover Options

4.6.7 **Table 4.2** overleaf provides a comparison between the tunnel and flyover options in broad terms, in respect of key indicators: affected area of the Harbour, impacts to existing traffic, technical highway concerns and impacts to existing highway structures, planning and land use considerations, environmental concerns, time of construction, and costs. Trunk Road Tunnel Variation 1 is used as the basis of tunnel option comparison. The key issue that is of concern in respect of the PHO is the area of the Harbour that will be affected by the tunnel and flyover options. Further elaboration of this issue is given in the following paragraphs.

Area of the Harbour affected by the Trunk Road Tunnel and Flyover Options

4.6.8 The PHO requires the Harbour to be protected and preserved as a special public asset and a natural heritage of the Hong Kong people, and establishes a presumption against reclamation in the Harbour. Notwithstanding that there is an overriding need for reclamation for the project, it is essential to find the option that will best serve to protect and preserve the Harbour, with the minimum area of the Harbour affected by reclamation. In this regard, the area of the Harbour affected by the alternative Trunk Road tunnel and flyover options is of greater concern. The flyover structures over water will impinge upon the water area of the Harbour and their visual impacts do not promote the protection and preservation of the Harbour. Moreover, where the marine use of existing water areas is restricted due to the presence of highway structures and the like, these affected water areas may not be regarded as “protected” or “preserved” for the purposes of the PHO.

4.6.9 Therefore, when examining Trunk Road options, and especially when examining the flyover option, the land formation by physical reclamation is taken into account together with the water areas of the Harbour affected by flyover structures in order to come up with an option that may serve best to protect and preserve the Harbour. **Figures 4.11** and **4.12** illustrate these affected areas of the Harbour, for the tunnel and flyover options respectively. These areas, for the tunnel and flyover options, are estimated to be as follows:

Affected Area of Harbour	Tunnel Option [1]	Flyover Option
(a) Land formed [2]	15 ha	11.5 ha
(b) Flyover structures over water [3]	0.5 ha	3 ha
(c) Affected water area [4]	-	4 ha

Notes:
1 Tunnel Variation 1 is used for comparison purposes.
2 Land formed by conventional reclamation.
3 The plan area of elevated highway structures that cross over water.
4 Areas of the Harbour obstructed by Trunk Road structures, or where marine uses are restricted.

4.6.10 The areas of land formed as given above are the areas of permanent reclamation, and include a notional allowance for reprovisioning requirements (for the Wan Chai ferry pier, salt water pumping station, cooling water pumping stations, etc) associated with each of these tunnel and flyover options. These reprovisioning requirements and any associated reclamation will be firmed up when the more detailed Concept Plans are developed, along with possible smoothing out of sharp corners along the shoreline.

4.6.11 It should also be noted that there will be a requirement for temporary works (including temporary reclamation) to facilitate the Trunk Road tunnel construction and for temporary traffic diversions. These temporary works will be required in the PCWA basin and in the CBTS. In the CBTS, the extent of the temporary works, for both the tunnel and flyover options, will be such that at least some of the existing moorings will need to be relocated outside the typhoon shelter during the construction period.

4.6.12 These temporary works areas are over and above the permanent works areas (para 4.6.9 (a) and (b) above), but are not considered as “areas affecting the Harbour” when comparing the alternative options insofar as these are temporary (for the duration of the construction period) and solely for the purpose of achieving the end product (ie in order to ultimately achieve minimum reclamation). The temporary works won’t cause permanent damage to the Harbour. Only the residual areas of the permanent works are assigned to the Trunk Road options as “areas affecting the Harbour”.

Table 4.2 Comparison of Tunnel and Flyover Options

		Tunnel Option	Flyover Option
Affected area of the Harbour: (a) Land formed (b) Flyover structures over water (c) Affected water area		15 ha 0.5 ha -	11.5 ha 3 ha 4 ha
Impact to existing traffic		Some disruption at new tie-in to IEC	• Major disruption at new tie-in to IEC • Major disruption due to reconstruction of Victoria Park Road connections
Other technical concerns (impacts to highways structures, etc)		Localised reconstruction of existing IEC at City Garden for merging with the Trunk Road	Reconstruction of existing IEC from Victoria Park Road to Victoria Centre
Planning and land use considerations	Along Wan Chai shoreline	Land formed can be used for harbour-front enhancement and pedestrian access to the waterfront	Land formed is partly occupied by the tunnel portal which constrains the extent of area for harbour-front enhancement and pedestrian access to the waterfront
	PCWA basin	PCWA basin can be developed into a vibrant marine recreational facility	Highway bridge piers and the low headroom clearance of the flyover restrict the development of the PCWA basin as a recreational facility
	Northern side of Victoria Park	Victoria Park can be extended to the harbour-front via a landscaped deck over the roads	With the flyover running along the northern side of Victoria Park, the landscaped deck over Victoria Park Road and extension of Victoria Park are impractical
	CBTS	The existing CBTS is preserved as far as possible	Part of the water area and the existing promenade will be occupied by bridge piers

		Tunnel Option	Flyover Option
Environmental concerns	Noise & Air	• Air quality concern at tunnel portal • Noise at tie-in to IEC (short 'new road' section of IEC)	Significant air and noise impacts along flyover section in Causeway Bay and reconstructed IEC at North Point ('new road')
	Water Quality	No major operational impacts due to the scheme	No major operational impacts due to the scheme
	Visual	No significant visual impacts	Significant impacts in Wan Chai and (especially) in Causeway Bay (flyover along part of Wan Chai shoreline and through CBTS)
Time for construction		7 years	6 years
Costs *(including WDII works & CWB in WDII)*	Total Construction	HK$20B	HK$11B
	Total Annual Recurrent	HK$110M	HK$75M

4.6.13 In most respects, it is found that the Trunk Road tunnel option (Tunnel Variation 1) performs better than the flyover option. The tunnel option:

- will result in a lesser affected area of the Harbour;
- will cause less traffic disruption during construction;
- will not require any major reconstruction of existing highway structures;
- will have more opportunities for harbour-front enhancement and providing access to the waterfront;
- will cause less extensive air and noise impacts (although air quality at the tunnel portal will need to be carefully addressed);
- will have no significant visual impacts (the flyover, on the other hand, will have significant visual impacts along the harbour-front).

4.6.14 Only in respect of time for construction and costs can the flyover option be seen as performing better than the tunnel option.

4.6.15 The key issue of concern is: "which option would serve best to protect and preserve the Harbour?" In addressing this question, the area of the Harbour that is affected by the Trunk Road options should be taken into account, including not only land formed by reclamation but also the impingement of highway structures on the existing water areas and the restricted use of water areas due to the presence of the highway structures (ie the

areas where the functionality of the Harbour is adversely affected). Add to this the visual aspects of the flyover option (viewed in terms of "preserving the Harbour"), and the Trunk Road tunnel option is clearly the option that would serve best to protect and preserve the Harbour.

4.7 Trunk Road Tunnel – Engineering Proposals

4.7.1 The Trunk Road Tunnel Variation 1 concept (illustrated in Figure 4.1 earlier) has been developed in more engineering detail so as to confirm its engineering feasibility. The Trunk Road tunnel layout through the WDII project area is shown in **Figure 4.13**. This scheme is considered to represent a practically feasible Trunk Road option, that meets minimum reclamation requirements.

4.7.2 The vertical profile of the Trunk Road tunnel scheme, including the section of the Trunk Road through CRIII, is given in **Figure 4.14**.

4.8 Flexibility for Future Submerging of the IEC

4.8.1 There have been suggestions from the public that the existing IEC should be submerged (to be replaced with tunnel structures) to reduce the visual impacts along the Causeway Bay and North Point shoreline. For Tunnel Variations 2 and 3, the existing IEC (from Victoria Park Road to outside City Garden in North Point) is suggested to be demolished and reconstructed as underpass and at-grade roads. However, for the Trunk Road Tunnel Variation 1, the existing IEC is retained.

4.8.2 The possibility of converting the existing elevated IEC into tunnel form in the future, for the Trunk Road Tunnel Variation 1, has been investigated, to ascertain whether, in the event of implementation of this Trunk Road tunnel scheme, any long term proposals for submerging the IEC, beyond the ambit of the WDII project, are not precluded. In examining the highway alignment aspects of such a variation, **Figure 4.15** shows a possible arrangement for reconstructing the existing IEC (from Victoria Park Road to outside City Garden in North Point) under the Trunk Road Tunnel Variation 1 proposal.

4.8.3 Comparing the Trunk Road tunnel schemes in respect of a possible future demolition and reconstruction of the IEC from North Point eastwards, from a highway alignment point of view, the Trunk Road Tunnel Variation 1 scheme will allow this opportunity and, indeed, Tunnel Variation 1 is preferred in this respect, as an extension of the Trunk Road tunnel further eastwards to replace the existing elevated IEC could be carried out with less traffic disruption than would be the case for Tunnel Variations 2 and 3.

4.8.4 It should be stressed, though, that the feasibility of the future submerging of the IEC will depend upon factors other than just the examination of the localised area of highway connection to the IEC, above. The feasibility of such a scheme still needs careful consideration, which will require much more detailed investigation of planning, engineering, traffic, marine and environmental impacts and issues.

5 HARBOUR-FRONT ENHANCEMENT

5.1 The Public's Vision

5.1.1 During the Envisioning Stage consultation, a number of harbour-front enhancement ideas were put forward by the public for consideration. These harbour-front enhancement ideas have been reviewed together with Trunk Road ideas, for the derivation of consolidated harbour-front and Trunk Road ideas. The consolidated ideas would then form the basis of the preparation of the Concept Plan(s) for the development and enhancement of the harbour-front of Wan Chai, Causeway Bay and the adjoining areas in the Realisation Stage of this project.

5.1.2 The general sentiment of the public, in respect of harbour-front enhancement and Trunk Road ideas, expressed through the Envisioning Stage consultation, includes:

- a keen desire for a high quality and vibrant waterfront with good accessibility;
- a preference for having the Trunk Road in tunnel;
- generally, an acceptance of the need for reclamation for shallow tunnel construction at the HKCEC and along the Wan Chai shoreline;
- but, rather have tunnel options that do not result in reclamation in the CBTS.

5.1.3 In the following paragraphs, the harbour-front enhancement ideas put forward by the public are reviewed in relation to the possible Trunk Road tunnel option. Practical and reasonable opportunities for harbour-front enhancement are identified that can be incorporated in the preparation of the Concept Plan(s) in the following Realization Stage.

5.1.4 On the other hand, harbour-front enhancement ideas that require reclamation (or represent reclamation in respect of occupying an area of the Victoria Harbour sea), where this requirement is not provided for by necessary reclamation formed for Trunk Road construction, are not pursued at this stage. The need for reclamation for these harbour-front enhancement ideas will need to be justified in their own right under the PHO, and should therefore be pursued separately to the WDII project proposals.

5.2 Proposed Harbour-front Enhancement Ideas

5.2.1 In view of the obvious need for enhancing the existing harbour-front of Wan Chai, Causeway Bay and adjoining areas, the emphasis in public submissions and public engagement exercises has tended to focus on the land and marine uses that would improve the quality, public amenity and accessibility of the waterfront areas.

5.2.2 Of the harbour-front enhancement ideas that have been received from the public at public forums and charrettes and through written submissions, during the course of the Envisioning Stage consultation process, those that are considered reasonable and worthwhile to pursue include:

(i) making use of the land formation along the Wan Chai shoreline (required for all Trunk Road schemes) for harbour-front enhancement;

(ii) developing the PCWA basin into a vibrant marine recreational facility;

(iii) extending Victoria Park to the harbour-front by decking over Victoria Park Road; or possibly by moving Victoria Park Road southwards into Victoria Park, which would be reconstructed with wide landscaped deck over the roads, thereby creating more waterfront promenade space;

(iv) preserving the existing CBTS as far as possible;

or (as a variation on this theme)

(v) limited reclamation at the two corners of the CBTS, to enhance these areas as landscaped promenade, whilst still retaining the main body of the typhoon shelter and its cultural significance;

(vi) constructing a boardwalk along the North Point shoreline.

5.2.3 **Figure 5.1** highlights these harbour-front enhancement ideas.

5.2.4 These ideas have been examined together with Trunk Road functional requirements to determine, through a holistic approach to harbour-front and transport planning, how the harbour-front enhancement ideas can be combined with the functional needs of the Trunk Road to form a consolidated harbour-front concept.

5.2.5 A practically feasible Trunk Road tunnel option has been proposed in Section 4 above (Figure 4.13). This tunnel option is used as the basis for consolidation of the harbour-front enhancement ideas suggested through public consultation.

5.3 Opportunities for Harbour-front Enhancement

5.3.1 The harbour-front enhancement ideas received from the public (listed above) have been combined with the functional form of the Trunk Road tunnel to examine various opportunities for harbour-front enhancement, making use of the minimum necessary areas of reclamation together with possible shoreline treatment. The following consolidated ideas for harbour-front enhancement and public enjoyment have been identified.

5.3.2 At the connection with CRIII and the HKCEC, reclamation is required for Trunk Road tunnel construction. The area to the west of the HKCEC could be developed as a ‘cultural district’, with spaces for arts and cultural fairs, performance venues, and the like. This could extend to the HKCEC Extension promenade as an ‘expo promenade’ that would include the Golden Bauhinia Square.

5.3.3 Subject to more detailed land use planning evaluation, a landscaped deck could extend from the Hong Kong Academy of Performing Arts (HKAPA) across the ground level roads to the waterfront, linking up the existing and the new cultural and entertainment harbour-front areas.

5.3.4 Another landscaped deck could extend from the Arts Centre and public garden outside the Grand Hyatt Hotel, over Road P2 to the promenade at the west side of the HKCEC Extension. The possibility of linking this up with the HKCEC Atrium Link and roof garden could be examined, turning this landscaped deck into a leisure and informal exhibition area.

5.3.5 Along the Wan Chai shoreline, reclamation is also required for Trunk Road tunnel construction, providing opportunity for the creation of a 'green leisure zone'. A landscaped recreational promenade could be developed incorporating harbour-front cafes and the like to add vibrancy to the waterfront. The reprovisioned Wan Chai ferry pier would be located on this waterfront.

5.3.6 Primary accessibility is envisaged via a landscaped deck that could be constructed over the existing Wan Chai North PTI (subject to land use planning considerations), connecting the existing podium level pedestrian circulation system of Harbour Centre, Great Eagle Centre, China Resources Building, HKCEC and other hinterland development, across Hung Hing Road (which is realigned to tie in with Road P2), to the waterfront and the ferry pier.

5.3.7 The PCWA basin would not be reclaimed, and could be turned into a 'marine recreational zone', for public use, and with mooring facilities for visiting sailing ships providing sight-seeing opportunities for local residents and visitors alike.

5.3.8 There is no residual reclamation in the CBTS for this Trunk Road tunnel option, providing positive response to the suggestion of preserving the CBTS as far as possible and retaining its cultural heritage value (this area could be regarded as the CBTS 'cultural heritage zone'). Whilst some reclamation in the corners of the typhoon shelter would provide further opportunity for waterfront enhancement, such reclamation is not necessary for this Trunk Road scheme and would therefore need to be justified in its own right under the PHO; this is not pursued here.

5.3.9 A landscaped deck over Victoria Park Road enables Victoria Park to be extended to the harbour-front from the existing raised 'knoll' area at the north-western corner of the park; however, in view of the limited promenade area available to provide a landing for this connection at the waterfront, staircase and lift access from the deck to the promenade need to be provided.

5.3.10 An additional connection is proposed to link up the marine recreational zone at the PCWA basin to the CBTS cultural heritage zone, via a pedestrian bridge over the CHT portal area. A bold aesthetic design is called for, to focus attention away from the surrounding road infrastructure. This bridge will enhance the existing limited, and traffic impacted, pedestrian route from the Wan Chai shoreline to the CBTS.

5.3.11 Along the North Point shoreline, where reclamation is required for Trunk Road tunnel construction, another leisure zone along the new shoreline could be created. Harbour-front leisure facilities with views out across the harbour would need to be integrated with landscaping to buffer the road infrastructure behind.

5.3.12 A boardwalk could be extended from this North Point leisure zone, along the North Point shoreline, although possible marine access restrictions and future plans for this stretch of shoreline should be borne in mind. This idea may need to be taken up with harbour-front enhancement planning for the North Point waterfront.

5.3.13 **Figure 5.2** provides an illustration of the consolidated ideas for harbour-front enhancement and Trunk Road tunnel, with the incorporation of the above waterfront opportunities and some broad-brushed landscape treatment.

5.3.14 **Figures 5.3** to **5.5** illustrate similar consolidated harbour-front enhancement ideas for the alternative Tunnel Variations 2 and 3, and for the Trunk Road Flyover.

5.4 Achieving the Public's Vision for Harbour-front Enhancement

5.4.1 Feedback from the public during the Envisioning Stage consultation indicates a desire for having the Trunk Road in tunnel, with acceptance of necessary reclamation along the Wan Chai shoreline that can be used for harbour-front enhancement, and the PCWA basin is turned into a marine recreational facility, but having no (or minimal) reclamation in the CBTS which should be preserved as far as possible. Victoria Park should be extended to the harbour-front by decking over Victoria Park Road.

5.4.2 These harbour-front suggestions from the public have been combined with the functional form of the Trunk Road tunnel to identify consolidated ideas for harbour-front enhancement. These include:

- a cultural district to the west of the HKCEC, for arts and cultural fairs, performance venues, and an expo promenade;
- a green leisure zone along the Wan Chai shoreline, with landscaped recreational promenade;
- a marine recreational zone at the PCWA basin, for public use;
- a cultural heritage zone at the CBTS, preserving the existing typhoon shelter, and with a landscaped deck providing an extension of Victoria Park to the waterfront;
- another leisure zone along the North Point shoreline, with a possible boardwalk extension along the North Point shoreline.

5.4.3 These practical and reasonable ideas for harbour-front enhancement can be further developed and incorporated in the preparation of the more detailed Concept Plan(s) for the project.

6 EFFECTS OF GROUND LEVEL HIGHWAY INFRASTRUCTURE

6.1 Introduction

6.1.1 In the previous section, harbour-front enhancement ideas were examined together with Trunk Road functional requirements to determine, through holistic consideration of harbour-front and transport planning, how the harbour-front enhancement ideas can be combined with the functional needs of the Trunk Road for the derivation of consolidated harbour-front and Trunk Road ideas.

6.1.2 Associated with the Trunk Road are various essential elements of highway infrastructure at ground level, such as tunnel ventilation and administration buildings, the Road P2 ground level road, slip road connections from the Trunk Road to the local road network in the Wan Chai North area, and a slip road connection to Trunk Road in the Causeway Bay area, which ensure functionality and adequate connectivity of the Trunk Road and the local road network.

6.1.3 This highway infrastructure and ground level road connections have been incorporated in the determination of consolidated ideas for harbour-front enhancement. Nevertheless, in view of the emphasis of the HER on harbour-front enhancement and improved accessibility, concerns have been expressed that, this ground level highway infrastructure, in particular the slip roads as they rise up from the Trunk Road tunnel to ground level roads, may compromise the HEC's harbour planning principles by taking up valuable waterfront land use space and affecting pedestrian accessibility.

6.1.4 This section examines the impacts of these roads on the harbour-front planning intentions, to determine whether the HEC's harbour planning principles would be compromised by the presence of these roads.

6.2 Tunnel Ventilation Buildings, Road P2 and Slip Road Connections

6.2.1 Provision of essential transport infrastructure is a key element of the WDII project. The need for the Trunk Road has been demonstrated in a district traffic study to relieve the existing east-west corridor (Connaught Road Central / Harcourt Road / Gloucester Road) which is already operating beyond its capacity.

6.2.2 The district traffic study also confirmed that, in addition to the Trunk Road, a complementary ground level road system comprising an east-west Road P2 and intermediate slip road connections are essential to achieve the objectives of implementing the Trunk Road, that is, to divert traffic away from the existing east-west corridor in order to provide relief to the corridor and to the local road network.

6.2.3 The need for Road P2 and the slip roads has also been confirmed by the Expert Panel, who recognise the need for Road P2 as and important *ad interim* measure in addressing traffic congestion in the Central reclamation area, and who further support the provision of slip roads at the HKCEC area and at the Victoria Park Road / Gloucester Road / Hing Fat Street passageway to magnify the benefits of the Trunk Road.

6.2.4 With the Trunk Road proposed in tunnel over most of its length, tunnel ventilation is an important element in the design and operation of the Trunk Road. Mechanical ventilation systems are required, with clean air being pumped into the tunnel and polluted air being extracted through ventilation buildings. Operation of the tunnel systems also requires a substantial administrative function, which requires administration and operative rooms in an administration building. Planning for the Trunk Road must include these infrastructural facilities.

Tunnel Ventilation Buildings

6.2.5 The ventilation system for the Trunk Road tunnel requires the construction of three buildings: the West Ventilation Building, located at the west portal in CRIII; the Central Ventilation Building, located near the central portion of the Trunk Road tunnel; and the East Ventilation and Administration Building, located at the east portal at the eastern end of WDII.

6.2.6 Ventilation systems requirements have been examined for the new longer Trunk Road tunnel than was originally proposed, and the land requirements for these ventilation and administration buildings reviewed for the upgraded ventilation systems. For the tunnel ventilation of the new Trunk Road tunnel, the West Ventilation Building will continue to occupy the same footprint as the original proposal (although the building height may need to be increased by one floor). The Central Ventilation Building will be a two-storey building that will occupy an area of approximately 0.1ha. This will be located in the highway amenity area in between ground level roads (Road P2 and Slip Road 3), away from the waterfront area and just to the west of the HKCEC, as highlighted in **Figure 6.1**. The East Ventilation Building, which is combined with the Administration Building, will be a three-storey building that will occupy an area of approximately 0.3ha. This building will be located over the footprint of the tunnel structure as to rises to the east portal on the North Point shoreline, as highlighted in **Figure 6.2**.

6.2.7 The ventilation building locations have been chosen such that they can provide for the essential engineering ventilation requirements, without which the Trunk Road tunnel cannot operate, and to minimise as far as possible the impacts on the harbourfront, by locating these facilities within road amenity areas or over the tunnel structures at the portal, where waterfront activities would be limited in any event.

Road P2

6.2.8 The major element of the future ground level road system is Road P2, which runs east-west from CRI to connections with the existing road network in Wan Chai North. Road P2 is a dual 2-lane primary distributor that serves both local east-west movements and the distribution of north-south traffic movements.

6.2.9 In the Central area, Road P2 will relieve the already intolerable traffic congestion at Man Po Street, Man Yiu Street, Man Cheung Street and Connaught Place, by drawing traffic away from the Connaught Road Central bottleneck. If this congestion continues to worsen, it will seriously affect the operations of Exchange Square, Hong Kong Airport Express / Tung Chung Line MTR Station, One and Two International Finance Centres,

hotel developments, ferry piers and other commercial developments in the area. The gridlock will in turn cause traffic blockages in other roads feeding into the area, including Pedder Street and Queen's Road Central.

6.2.10 Moving eastwards, Road P2 also serves to provide access to the existing and new development areas through CRIII and WDII, drawing local traffic away from the Connaught Road Central / Harcourt Road / Gloucester Road corridor. Road P2 enables eastbound connection from the CRI and CRIII areas to the Trunk Road and (extending along Hung Hing Road and Victoria Park Road) to Causeway Bay.

6.2.11 Deteriorating north-south traffic conditions (between the Admiralty and Wan Chai hinterland areas and the northshore and east-west corridor) are due to the current distribution of this traffic along Harcourt Road / Gloucester Road, where major weaving and merging movements on this congested corridor cause delays, and short north-south connecting roads to the northshore area with closely spaced and congested junctions (eg Fleming Road, where blockages at the junctions with Hung Hing Road and Harbour Road causes tailbacks all the way back to Hennessy Road). Road P2 will provide an alternative distribution routeing for the north-south traffic, and the new junctions with the north-south connecting roads along Road P2, with their improved capacity, will relieve the current congestion problems on these roads.

6.2.12 The Road P2 alignment has been planned to run over the top of the Trunk Road tunnel through CRIII and the HKCEC water channel, to the connection with Fleming Road, in order to minimise the overall road "footprint" and the area of land sterilised by highway infrastructure. The area occupied by Road P2 within the WDII project area, albeit within the footprint of the Trunk Road tunnel, is around 1.1ha.

6.2.13 The new junction with Fleming Road / Hung Hing Road will improve traffic conditions along Fleming Road, by moving critical bottleneck junctions (Fleming Road / Hung Hing Road and Fleming Road / Harbour Road) further apart to overcome the current congestion caused by tailbacks along Fleming Road through Harbour Road. **Figure 6.1** highlights the Road P2 layout in the WDII project area.

6.2.14 Along the Wan Chai shoreline, the existing Hung Hing Road in front of the Wan Chai North PTI is realigned to connect with the new Road P2 / Fleming Road junction, but the current Hung Hing Road alignment in front of the Wan Chai Sports Ground is retained. This slight realignment of Hung Hing Road provides additional space at the PTI to relocate the existing bus terminus at Expo Drive East, thus freeing up the area adjacent to the Golden Bauhinia Square for waterfront promenade, while the retention further east of the existing Hung Hing Road alignment means that there is no intrusion by new roads into the new Wan Chai waterfront area.

Slip Roads 1, 2 and 3

6.2.15 The slip road connections in Wan Chai North are also indicated in **Figure 6.1**. Three slip road connections are proposed, to tie into the ground level road layout:

- Slip Road 1, for traffic from Central and the western districts of Hong Kong Island to exit the eastbound Trunk Road tunnel, going to Wan Chai. This slip road also allows traffic connection from the Trunk Road eastbound to Causeway Bay and Tin Hau, as no direct slip road connection from the Trunk Road is provided in Causeway Bay for this movement.

  If this slip road is not built, the traffic would have to use Gloucester Road eastbound and Queensway. Overloaded traffic conditions would occur in particular along Gloucester Road eastbound along the section between Fenwick Street and Fleming Road.

- Slip Road 2, for traffic from the Admiralty and Wan Chai areas to enter the eastbound Trunk Road tunnel, going to the IEC and then North Point and the eastern districts of Hong Kong Island.

  If this slip road is not built, the traffic would have to use Gloucester Road eastbound and Hung Hing Road. As a result, both these roads would be congested, in particular Gloucester Road along the section between Fleming Road and Tonnochy Road.

- Slip Road 3, for traffic from the IEC (ie from North Point and the eastern districts of Hong Kong Island) to exit the westbound Trunk Road tunnel, going to Wan Chai North and beyond to the Wan Chai hinterland and Admiralty.

  If this slip road is not built, the traffic would have to use Victoria Park Road westbound, Gloucester Road westbound and inner Gloucester Road. This diverted traffic would overload Victoria Park Road westbound as well as inner Gloucester Road, with little change from today's congested conditions. In addition, diverted traffic would use Tonnochy Road Flyover to access Wan Chai North, with traffic flow on Harbour Road increasing as a result and the junctions with Fenwick Pier Street and Fleming Road overloaded.

6.2.16 These Wan Chai North slip roads (Slip Roads 1, 2 and 3) provide essential connectivity between the Trunk Road and the local road network, by drawing traffic away from the overloaded sections of Connaught Road Central / Harcourt Road / Gloucester Road. If access to the Trunk Road is not available, it cannot be properly utilised. The demand for a bypass comes not just from traffic from the western side of Hong Kong Island to the eastern side of the Island; traffic to/from intermediate areas such as Admiralty, Wan Chai and Causeway Bay also contribute to the congestion in this area. Restricting access to the Trunk Road for this traffic will undermine its purpose in relieving traffic congestion on the overloaded east-west corridor.

6.2.17 The need for an accessible Trunk Road is supported by traffic studies that indicate a high level of demand for the Wan Chai North slip road access onto and off the Trunk Road. Traffic forecasts indicate a peak hour traffic demand for the three slip roads as high as the flows on some sections of Gloucester Road today. Without access to the Trunk Road, this traffic will remain on the Connaught Road Central / Harcourt Road / Gloucester Road corridor.

Slip Road 8

6.2.18 The slip road connection in Causeway Bay is indicated in **Figure 6.2**, which also shows the proposed landscaped deck over Victoria Park Road, based on the consolidated ideas for harbour-front enhancement and Trunk Road tunnel (as described in Section 5 and illustrated in Figure 5.2). In order to avoid intrusion into the typhoon shelter, and associated reclamation, the slip road is proposed as a tunnel running along the northern boundary of Victoria Park.

6.2.19 Slip Road 8 is proposed for traffic from Causeway Bay, Tai Hang, Fortress Hill and Tin Hau areas to enter the westbound Trunk Road tunnel, going to Central and the western districts of Hong Kong Island. The slip road will divert the heavy traffic flows away from the busy local roads. The only other access to the eastern end of the Trunk Road is via the IEC, with the closest connection to the local road network being at Tong Shui Road, in North Point. Traffic from the Causeway Bay, Tai Hang, Fortress Hill and Tin Hau areas therefore needs Slip Road 8 to access the Trunk Road, otherwise all traffic from these areas going to Central would have to continue using Gloucester Road / Harcourt Road / Connaught Road Central.

6.2.20 The need for an accessible Trunk Road is supported by traffic studies that indicate a high level of demand for this slip road. The addition of Slip Road 8 to the road network not only allows traffic from the Causeway Bay and Tin Hau areas going to the Central and Western districts to bypass the congested Gloucester Road, it also results in an overall reduction of traffic on the Gloucester Road westbound corridor. The relief provided to the existing roads in Causeway Bay, in particular, will be significant: reduced traffic along Gloucester Road, especially in the section outside Excelsior Hotel / Sino Plaza, will largely resolve the current congestion problems in this area and on local roads feeding into this area. Without Slip Road 8, the section of Gloucester Road outside the Excelsior Hotel will continue to operate over capacity, as will roads feeding into this area, such as Gloucester Road Flyover. The current congested situation in this area will continue, even with the Trunk Road itself in place.

6.3 The Effects of Slip Roads 1, 2 and 3 on Harbour Planning

6.3.1 As an overview to harbour-front planning, the HEC has established a number of harbour planning principles which should be followed when examining Trunk Road and harbour-front enhancement schemes (refer to section 1.2). There is a concern that the slip roads may compromise these harbour planning principles, specifically by sterilising valuable waterfront space that could otherwise be used for quality waterfront development, and by affecting accessibility by cutting off pedestrian access to and along the harbour-front.

6.3.2 **Figure 6.3** illustrates the accessibility potential of the consolidated ideas for the Wan Chai North area. In addition to a continuous east-west waterfront promenade, a number of north-south linkages could possibly be provided:

- via a landscaped deck over Road P2 from the HKAPA (subject to further land use planning assessment) to the waterfront at the western end of WDII and linking to the CRIII waterfront;

- via a landscaped deck over Road P2 from the Arts Centre and public garden outside the Grand Hyatt Hotel, to the promenade at the west side of the HKCEC Extension;
- through the HKCEC Atrium Link from the existing podium level walkway system in Wan Chai to the HKCEC Extension and surrounding waterfront;
- via a landscaped deck over the existing Wan Chai North PTI (subject to land use considerations) and over Road P2 to the Wan Chai waterfront and ferry pier;
- via a proposed footbridge over Road P2 connecting the existing Wan Chai Training Pool podium to the Wan Chai leisure waterfront;
- via a proposed footbridge along Wan Shing Street and over Hung Hing Road, that can link up with existing footbridges back into Causeway Bay.

6.3.3 These grade separated connections can be supplemented by at-grade pedestrian connections at the signalised junction of Road P2 / Fleming Road.

6.3.4 As can be seen from Figure 6.3, none of the Slip Roads 1, 2 or 3 (highlighted in the figure) impinge upon these proposed pedestrian connections or waterfront access routes. The slip roads are located outside the main access desire lines in landscaped amenity areas. The presence of the slip roads does not affect harbour-front accessibility.

6.3.5 **Figure 6.4** shows the Wan Chai North area without the slip roads, to illustrate whether there would be any significant gain in harbour-front planning terms. The main activity nodes in this area are highlighted, being a cultural and entertainment zone to the west of the HKCEC, an Expo Promenade to the north of the HKCEC Extension and a green leisure zone along the Wan Chai shoreline to the east of the HKCEC Extension.

6.3.6 These activity nodes link back directly to the hinterland with connections as discussed above, and are linked to each via the continuous waterfront promenade access.

6.3.7 The areas that would otherwise be occupied by the slip roads are indicated: as can be seen, they do not affect, and are not affected by, the activity nodes or their linkages. The slip road areas would remain as landscaped highway amenity areas, not waterfront activity areas. The area occupied by the ground level slip roads is not significant, in total only around 0.65ha. The absence of the slip roads does not result in any enhancement of the activity nodes or entertainment or leisure zones. There would therefore be no major gain in harbour-front planning terms, if the slip roads were to be omitted.

6.3.8 On the other hand, the inclusion of the slip roads will improve vehicle access to Wan Chai North and the future waterfront, but without forming barriers to pedestrian access to the waterfront.

6.4 The Effects of Slip Road 8 on Harbour Planning

6.4.1 As for the case with Slip Roads 1, 2 and 3, there is a concern that the slip road in Causeway Bay may compromise HEC's harbour planning principles, by sterilising waterfront space that could otherwise be used for quality waterfront development, and by affecting accessibility by cutting off pedestrian access to and along the harbour-front.

6.4.2 **Figure 6.5** illustrates the accessibility potential of the consolidated ideas for the Causeway Bay area (incorporating the Trunk Road tunnel base idea). In addition to a continuous east-west waterfront promenade, the major north-south linkage is provided via the landscaped deck that creates an extension of Victoria Park to the Causeway Bay waterfront.

6.4.3 This grade separated connection would be supplemented by at-grade pedestrian connections at the signalised junctions at Victoria Park Road / Hing Fat Street, providing access from the Tin Hau area.

6.4.4 As can be seen from Figure 6.5, Slip Road 8 (highlighted in the figure) does not impinge upon any of these proposed pedestrian connections or waterfront access routes. The slip road is located outside the waterfront area and the presence of the slip road does not affect harbour-front accessibility.

6.4.5 **Figure 6.6** shows the Causeway Bay waterfront area without the slip road, to illustrate whether there would be any significant gain in harbour-front planning terms. The primary activity routes in this area are highlighted, being the main pedestrian flow paths along the waterfront and back into Victoria Park.

6.4.6 The area that would otherwise be occupied by the slip road is indicated: as can be seen, this does not affect, and is not affected by, the activity routes (or pedestrian flow paths). Although there is a small loss of park space (around 0.2ha) along the northern boundary of Victoria Park, there would therefore be no major gain in harbour-front planning terms, if the slip road were to be omitted.

6.5 Summary of Ground Level Highway Infrastructure Impacts

6.5.1 Trunk Road tunnel ventilation requires the provision, within the WDII project area, of a Central Ventilation Building and an East Ventilation and Administration building. These buildings, which house essential infrastructure without which the tunnel cannot operate, are located within road amenity areas or over the footprint of the Trunk Road tunnel structure in less sensitive waterfront promenade areas. These facilities will not compromise harbour-front accessibility or planning.

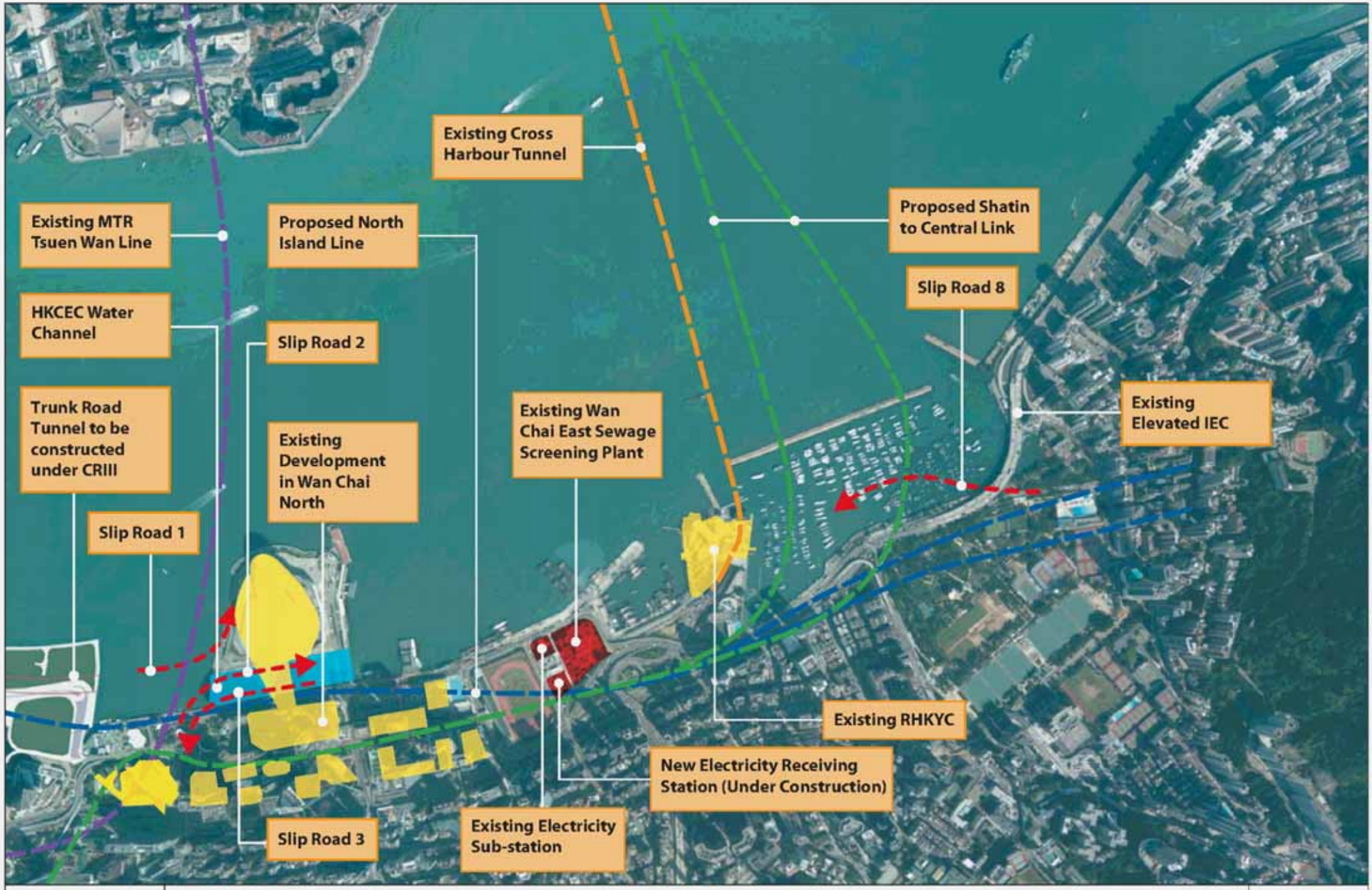
6.5.2 Road P2 is an essential element of the new road network, serving local east-west traffic movements and the distribution of north-south movements. Road P2 is planned to run within the footprint of the Trunk Road, to minimise the area sterilised by highway infrastructure. The road does not impinge upon the new waterfront promenade area, and pedestrian connections over the top of Road P2 ensure that the road does not compromise harbour-front accessibility.

6.5.3 Three slip road connections (Slip Roads 1, 2 and 3) to the Trunk Road are proposed in Wan Chai North, for traffic from Central and western Hong Kong Island, and for traffic from the IEC and eastern Hong Kong Island, to/from Wan Chai and surrounding areas. The slip roads enable traffic to be diverted away from the Connaught Road Central / Harcourt Road / Gloucester Road corridor and ensure that the Trunk Road is properly

and effectively utilised. These slip roads tie into a ground level road layout, of which Road P2 is the major component.

6.5.4 A slip road connection (Slip Road 8) to the Trunk Road is also proposed in Causeway Bay, taking traffic from the Causeway Bay, Tai Hang, Fortress Hill and Tin Hau areas to Central and the western districts of Hong Kong Island.

6.5.5 The effects of these slip roads on harbour-front accessibility and harbour-front planning have been examined. The location of the slip roads is such that they do not impinge upon any proposed pedestrian connections or waterfront access routes. Therefore, the presence of the slip roads does not affect harbour-front accessibility. Neither does the presence of the slip roads affect the envisaged waterfront activity nodes or their linkages, and there would be no major gain in harbour-front planning terms if the slip roads were to be omitted. Rather, the slip roads provide a beneficial improvement in terms of vehicular access to Wan Chai North, Causeway Bay and the waterfront area.



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WAN CHAI DEVELOPMENT PHASE II – PLANNING AND ENGINEERING REVIEW

TRUNK ROAD ALIGNMENT CONSTRAINTS

FIGURE 2.1

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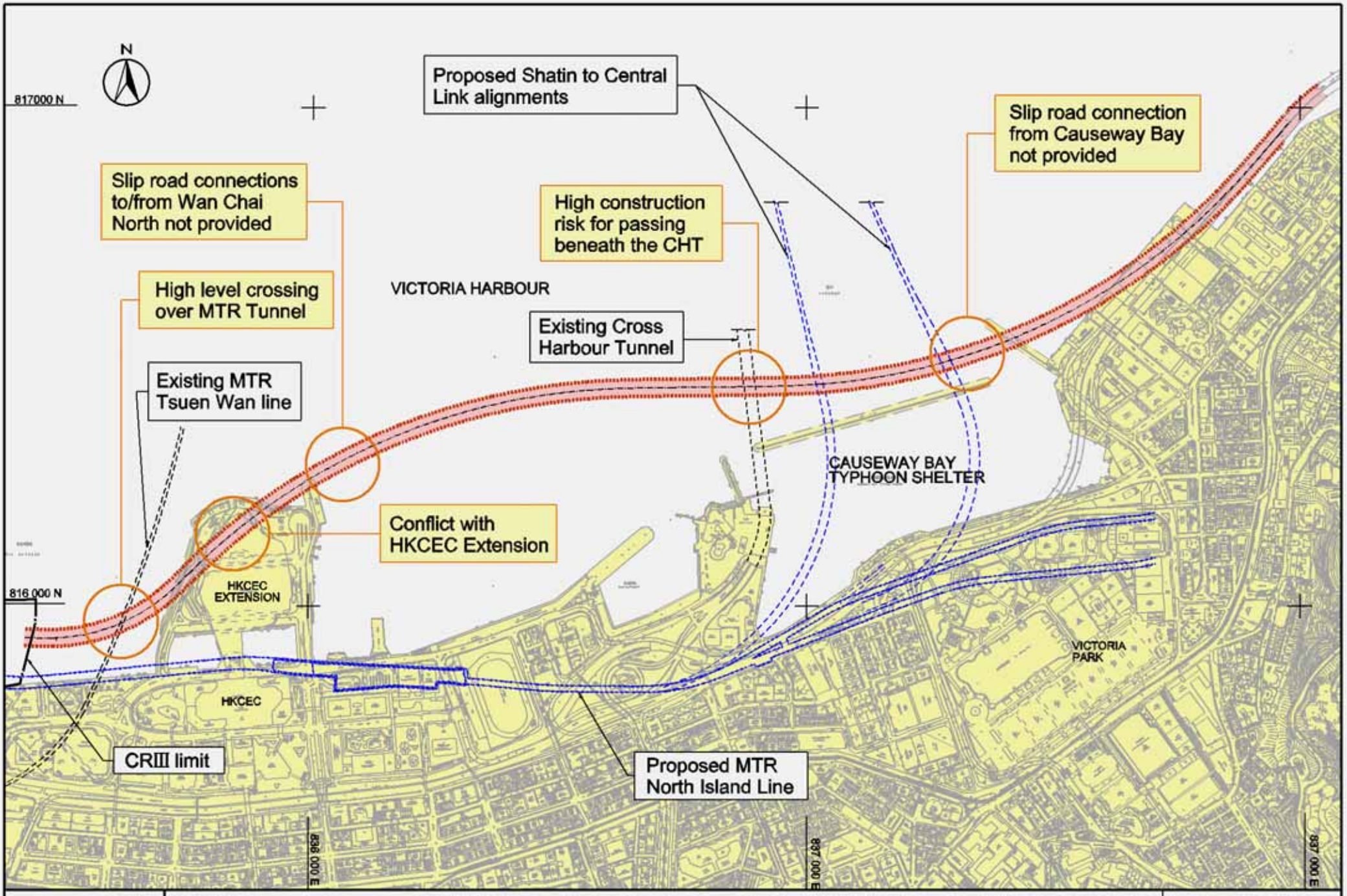
WAN CHAI DEVELOPMENT PHASE II – PLANNING AND ENGINEERING REVIEW

TRUNK ROAD ALIGNMENT CORRIDORS

FIGURE 2.2



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WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

OFFSHORE ALIGNMENT

FIGURE 2.3

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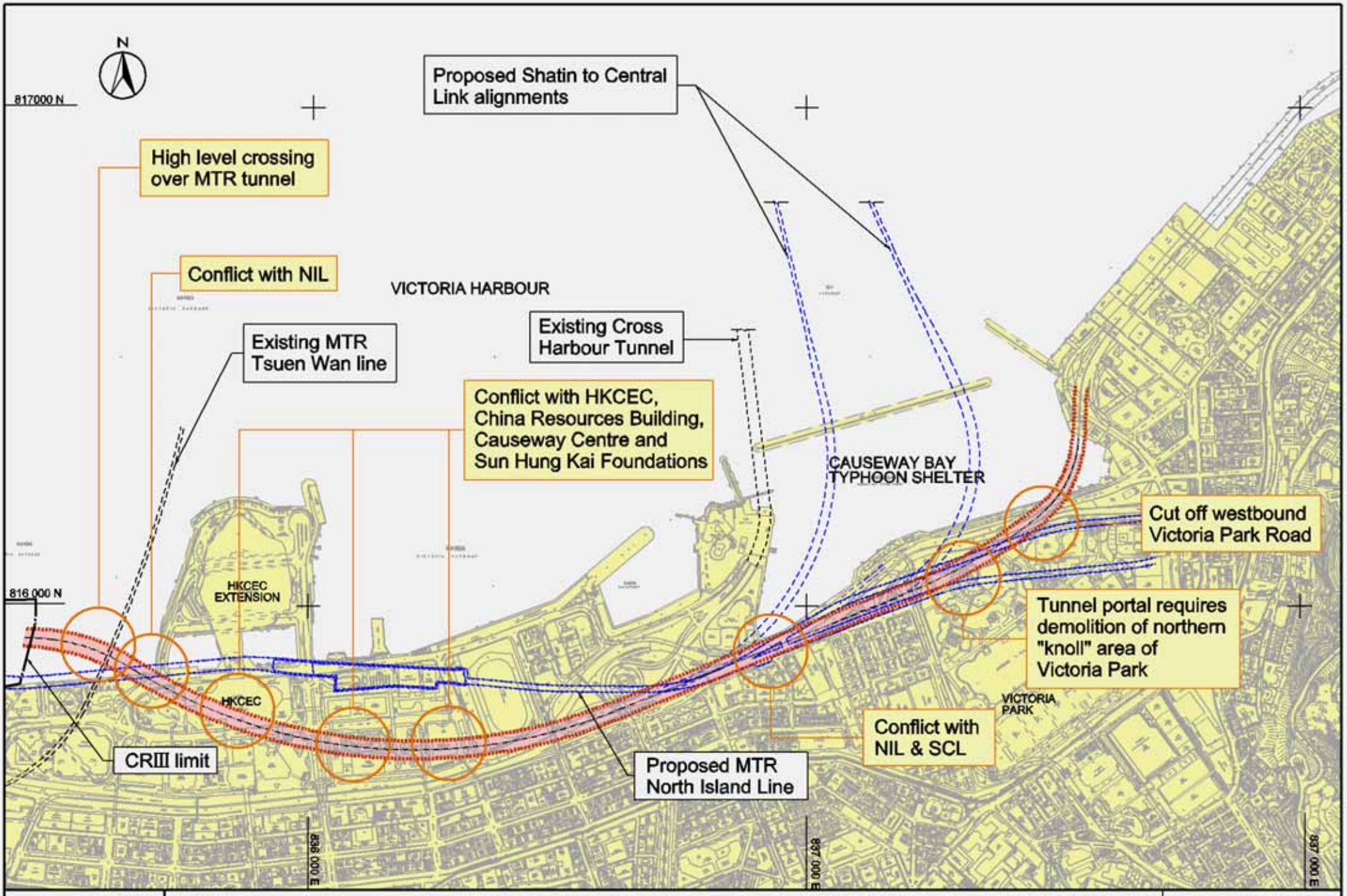

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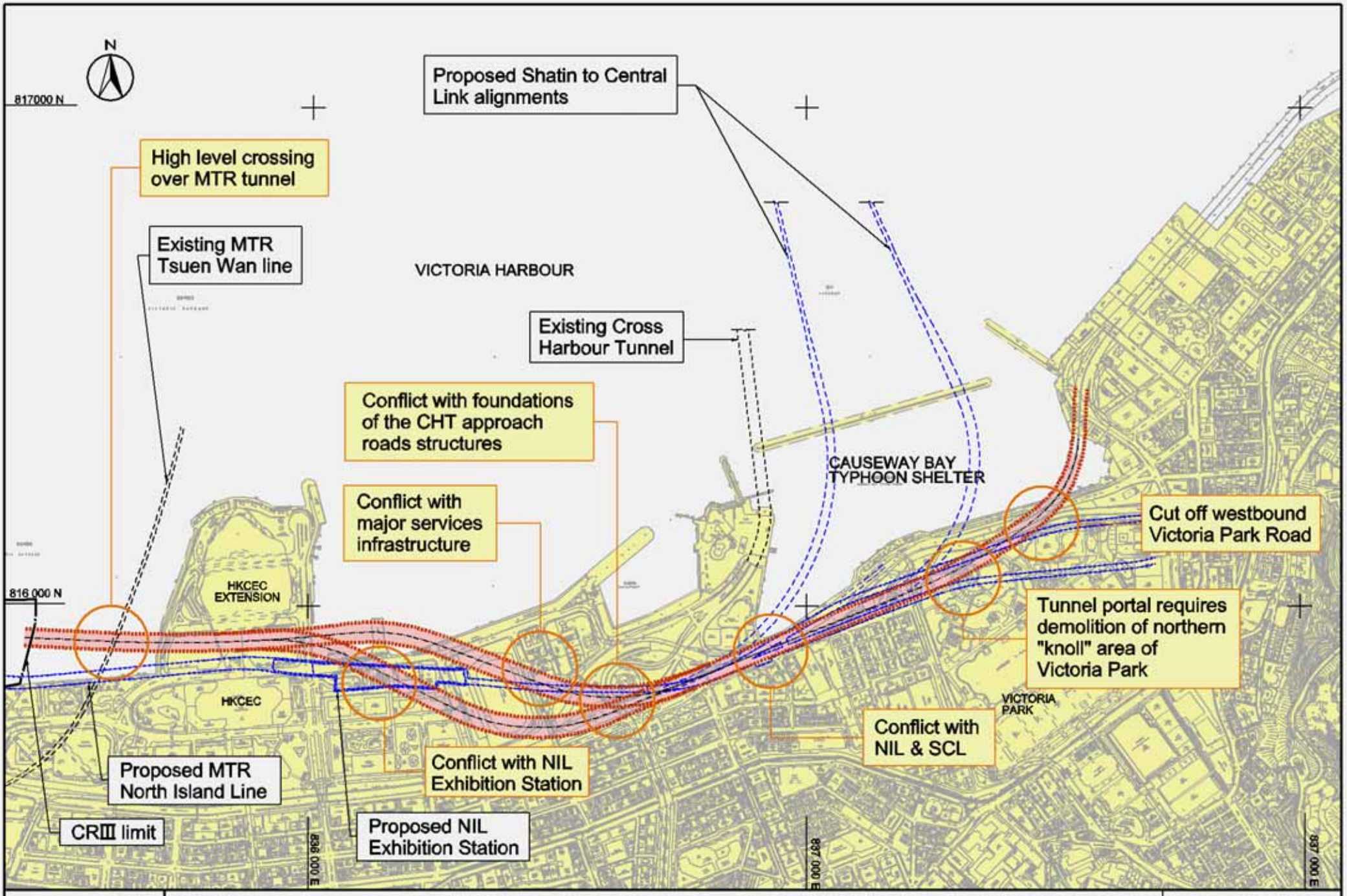
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

INLAND ALIGNMENT

FIGURE 2.4

IC-D11 Q:/PROJECTS/97103/DRAWING/REPORT/HEC COMBINED PAPER 1/FIG2.4.DGN/MAR. 06/A4 SCALE 1:10000



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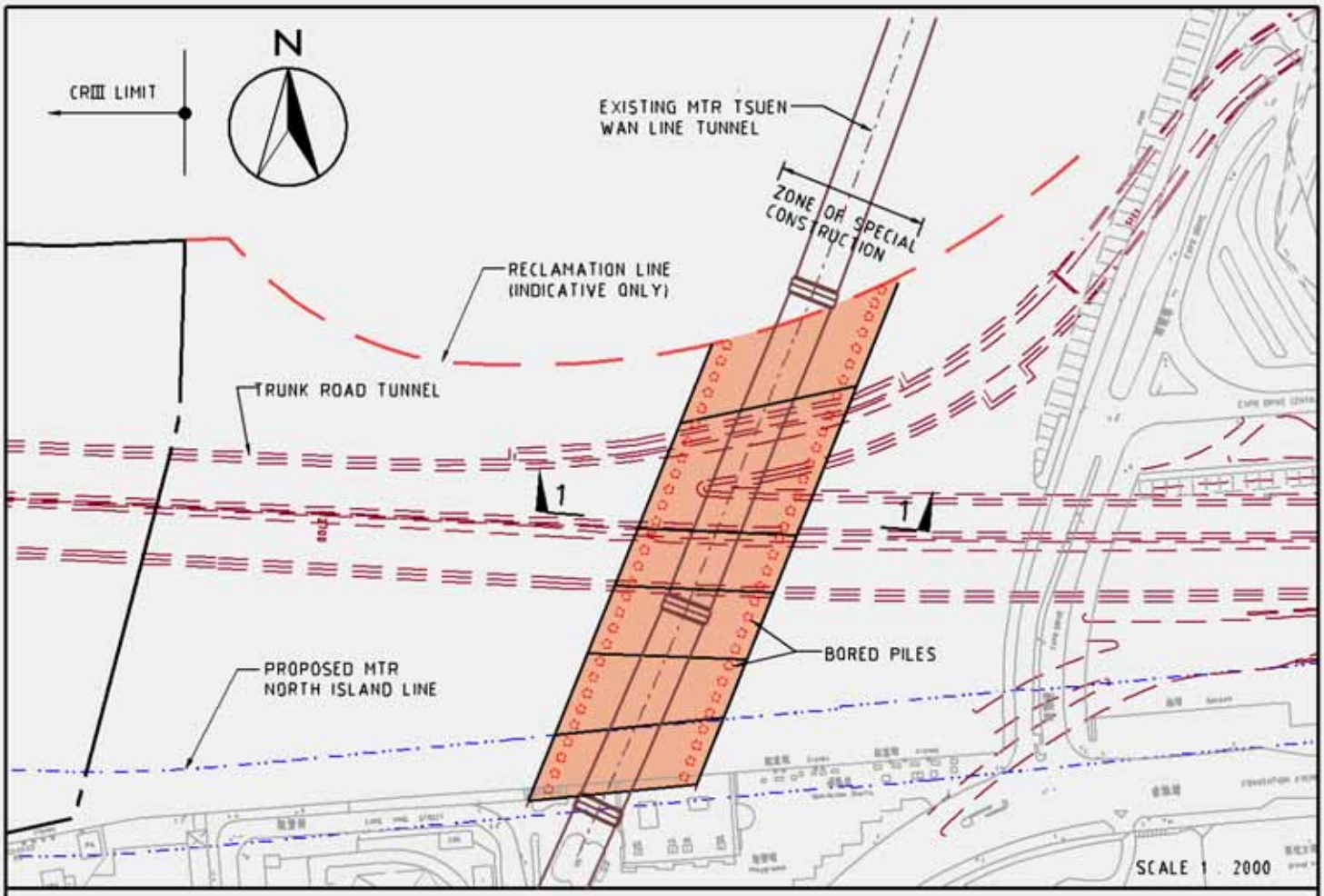
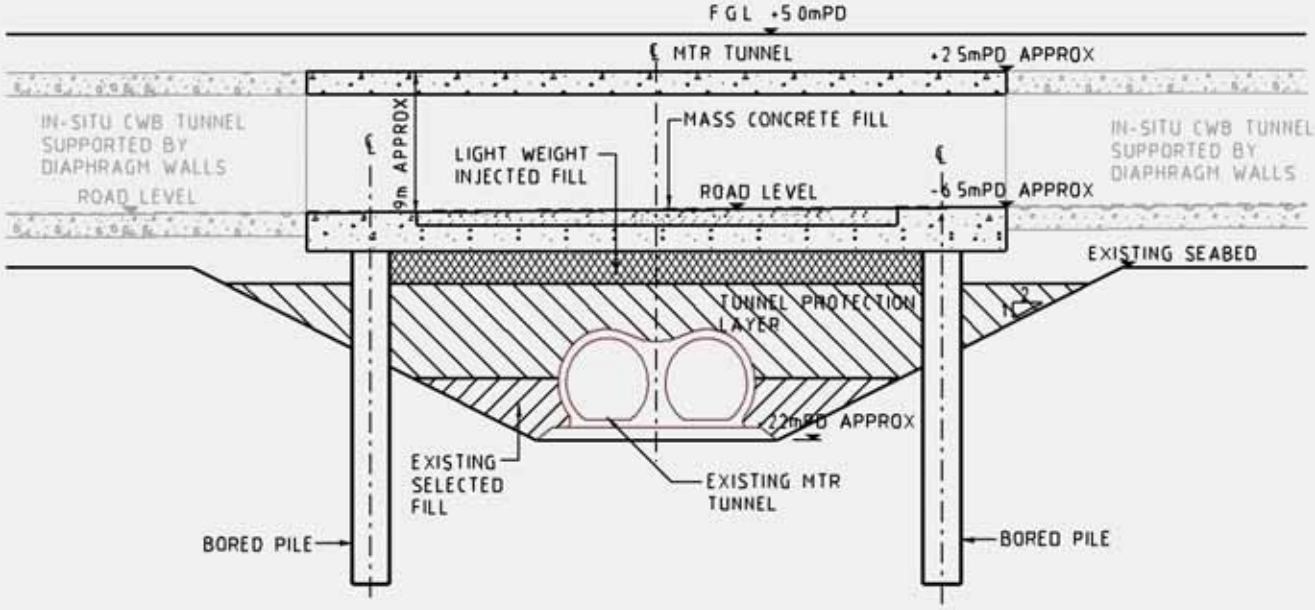
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

ALTERNATIVE INLAND ALIGNMENTS

FIGURE 2.5

IC-011 Q:/PROJECTS/97103/DRAWING/REPORT/HEC COMBINED PAPER 1/FIG2.5.DGN/MAR. 06/A4 SCALE 1:10000





SECTION 1-1
(ILLUSTRATIVE SECTION OVER MTR TSUEN WAN LINE)

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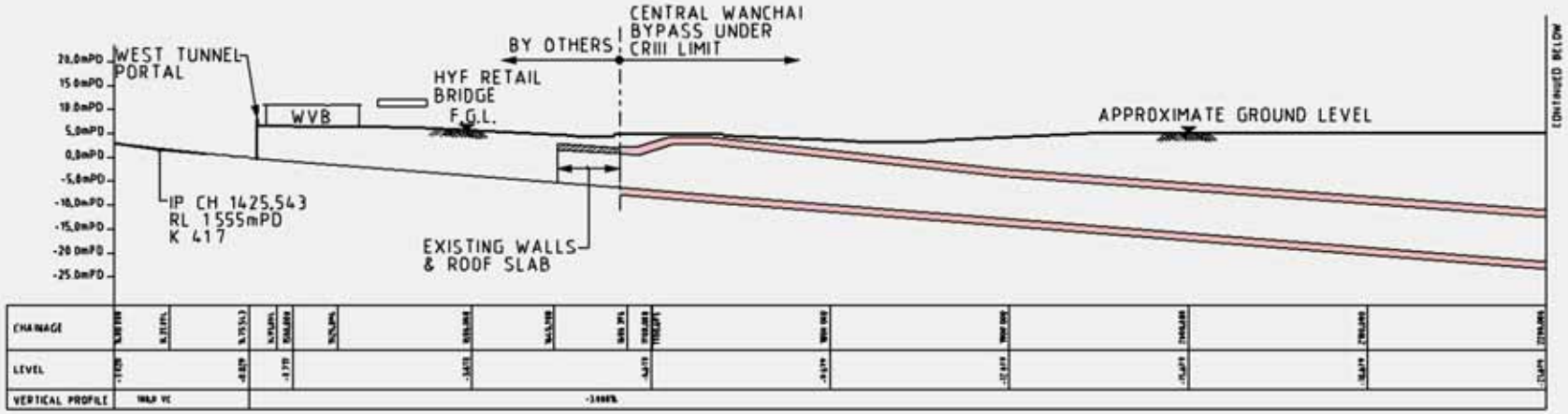
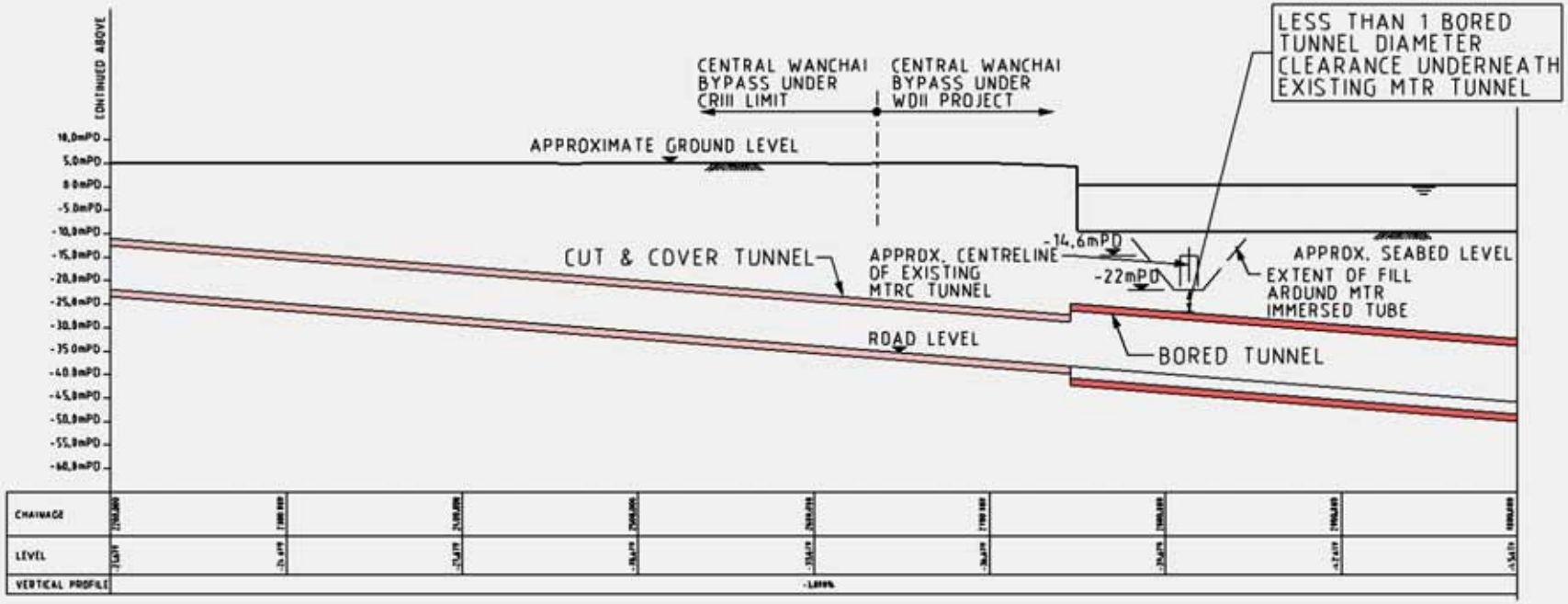
TRUNK ROAD TUNNEL CROSSING OVER EXISTING MTR TUNNEL

FIGURE 3.1

(SZ01) $FILE$



VERTICAL PROFILE
HORI SCALE 1:4000
VERT SCALE 1:500



VERTICAL PROFILE
HORI. SCALE 1:4000
VERT. SCALE 1:1500

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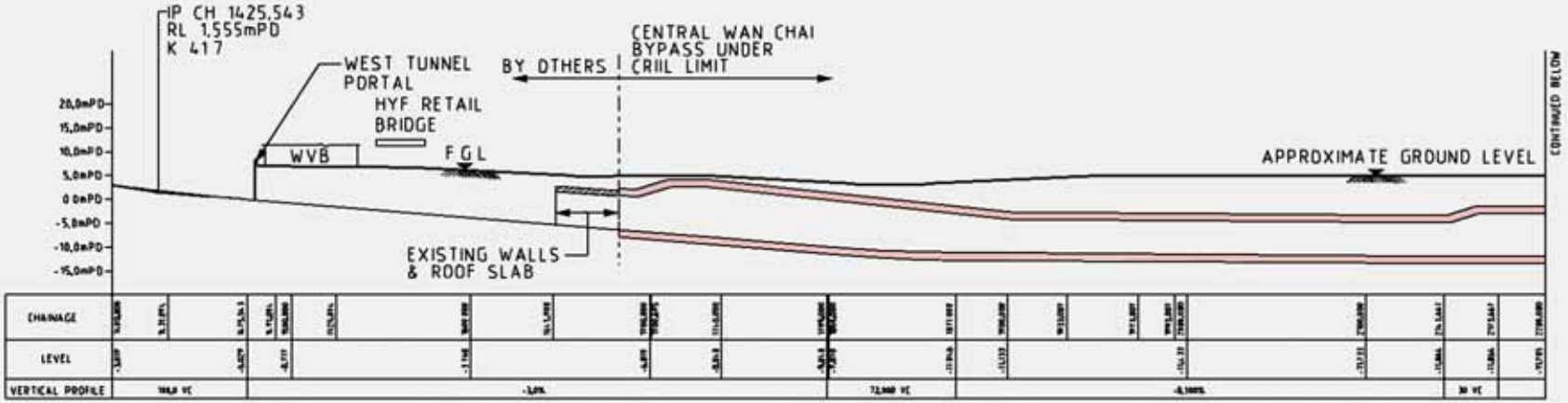
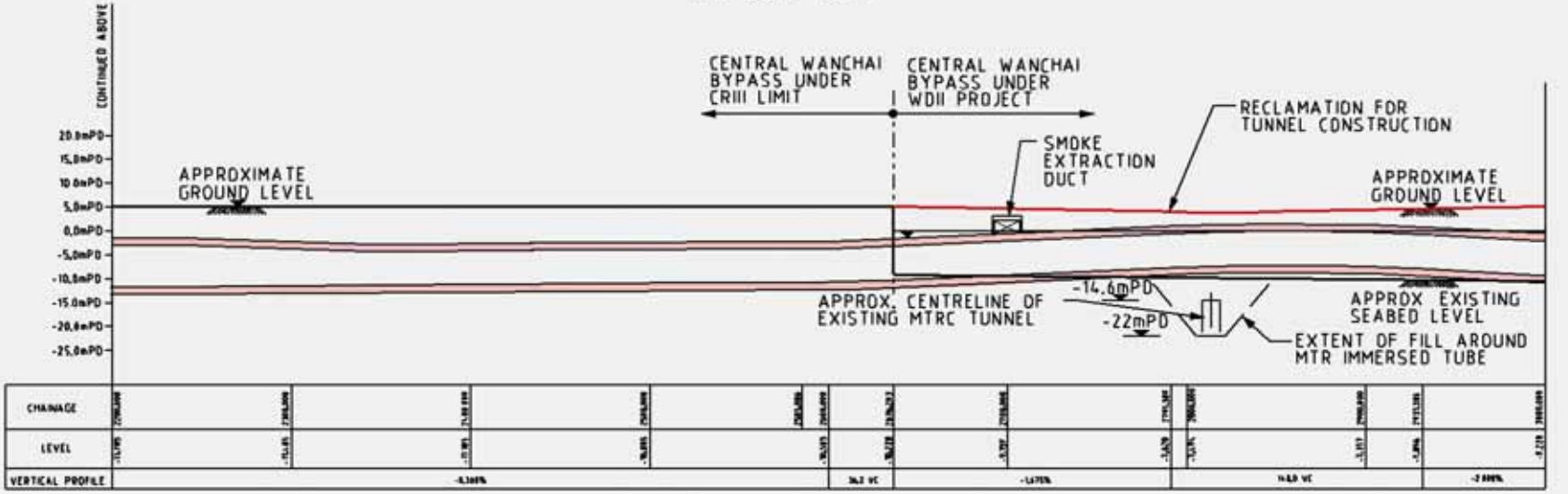
TRUNK ROAD BORED TUNNEL BENEATH MTR TUNNEL

FIGURE 3.2

ISZOI $FILE$



VERTICAL PROFILE
HORI. SCALE 1:4000
VERT SCALE 1-1500



VERTICAL PROFILE
HORI SCALE 1:4000
VERT. SCALE 1:1500

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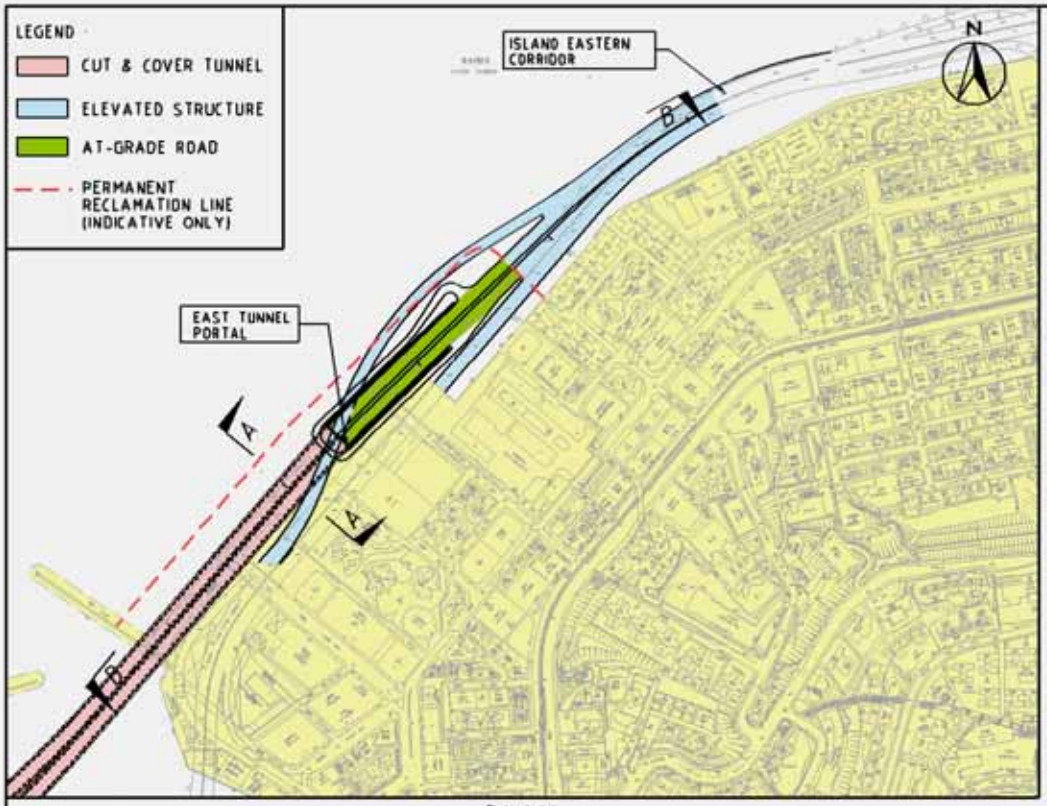
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

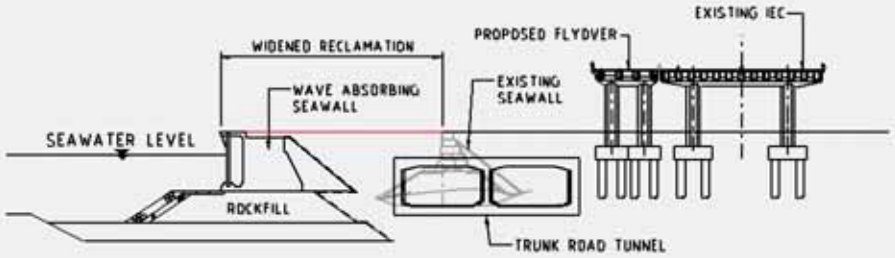
TRUNK ROAD TUNNEL ABOVE MTR TUNNEL

FIGURE 3.3

ISZ01 $FILE$



PLAN
SCALE 1:6000



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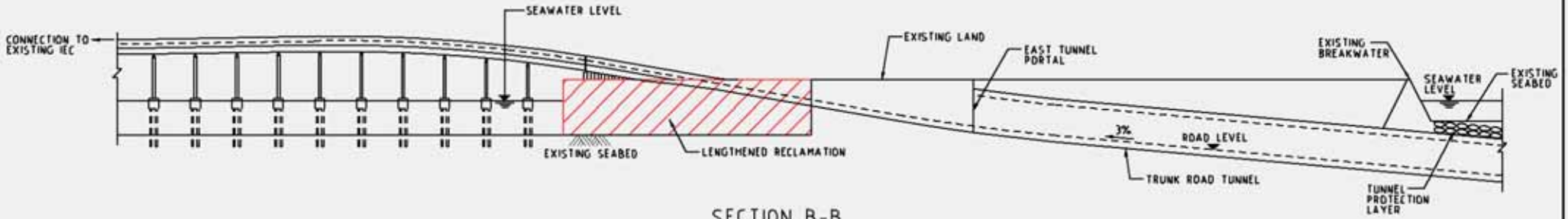
SCALE 1:1000



SECTION B-B
SCALE HOR. 1:3000
VER. 1:1000

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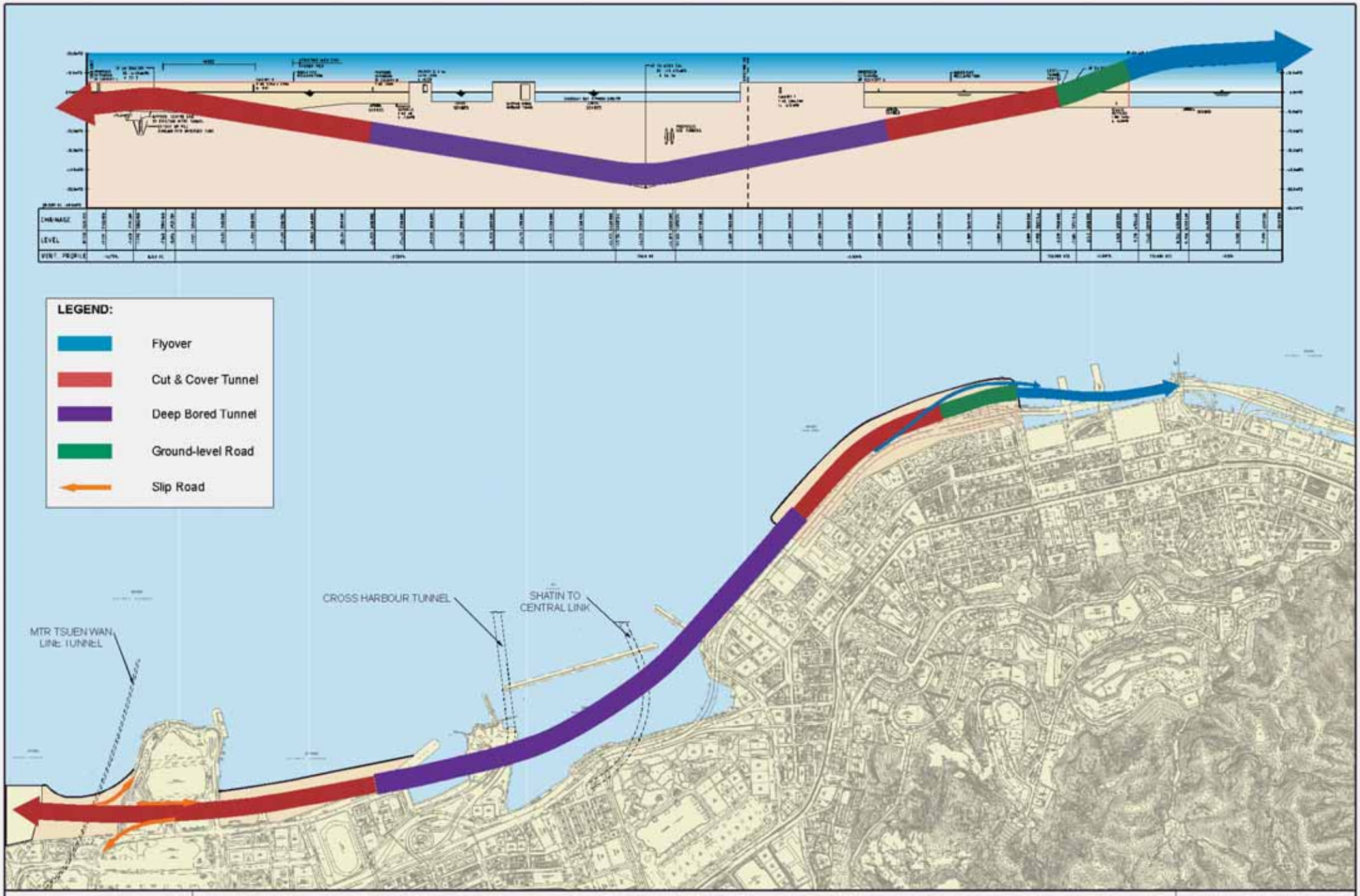
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

RECLAMATION AT NORTH POINT

FIGURE 3.4

ISZDI $FILES



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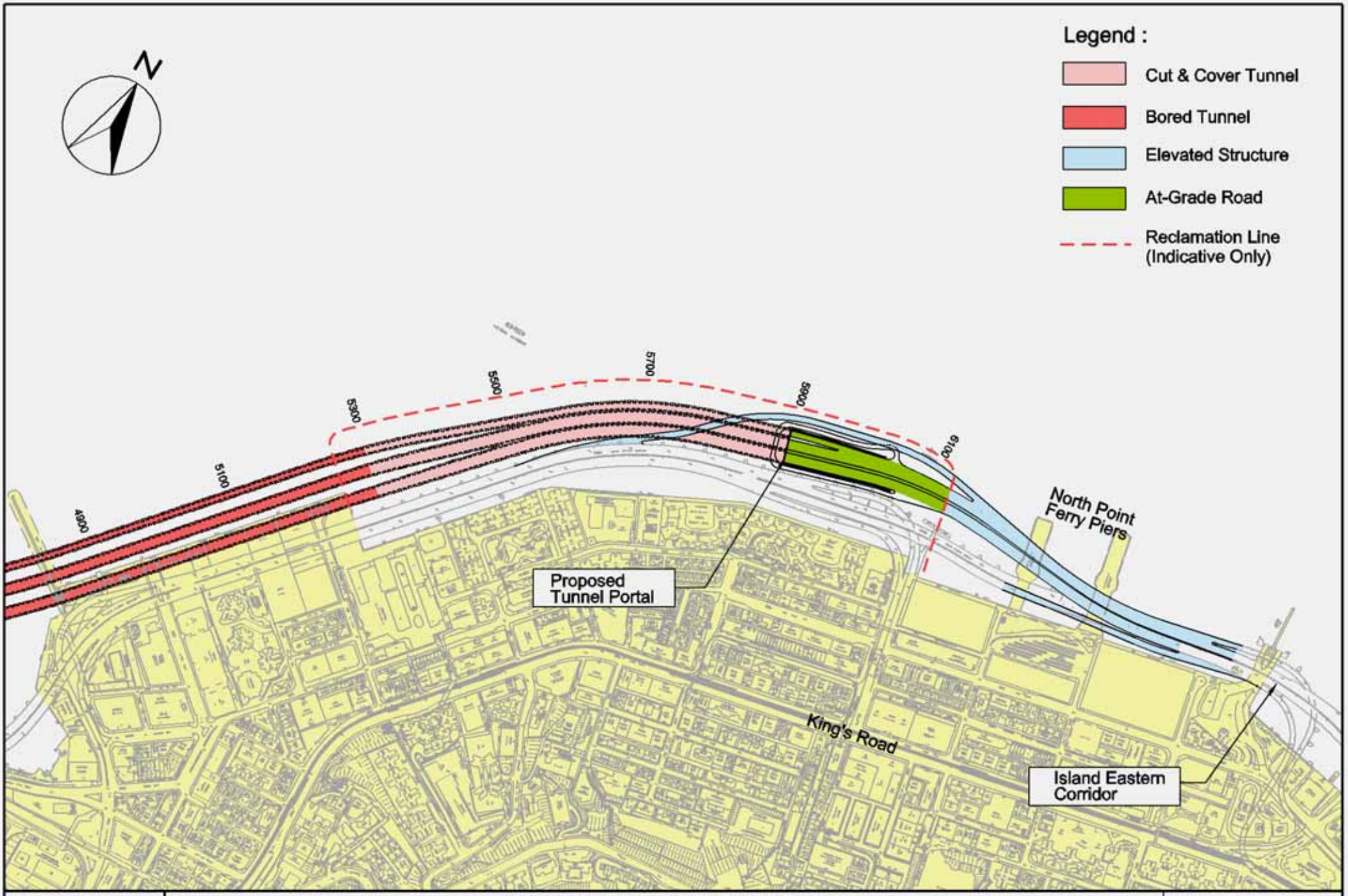
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

TRUNK ROAD DEEP TUNNEL OPTION

FIGURE 3.5



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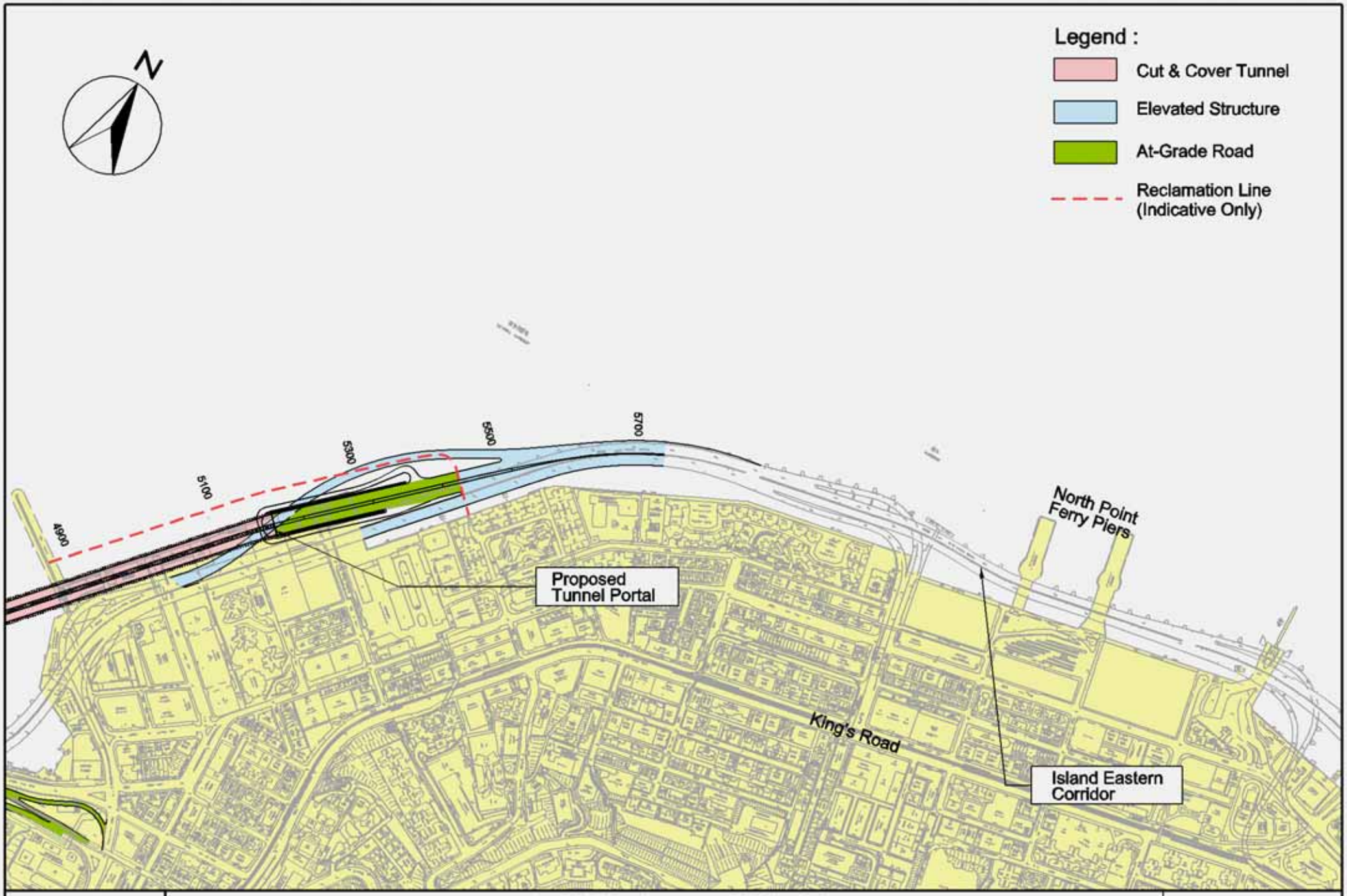
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

DEEP TUNNEL OPTION AT NORTH POINT

FIGURE 3.6

I5ZDI $FILE$



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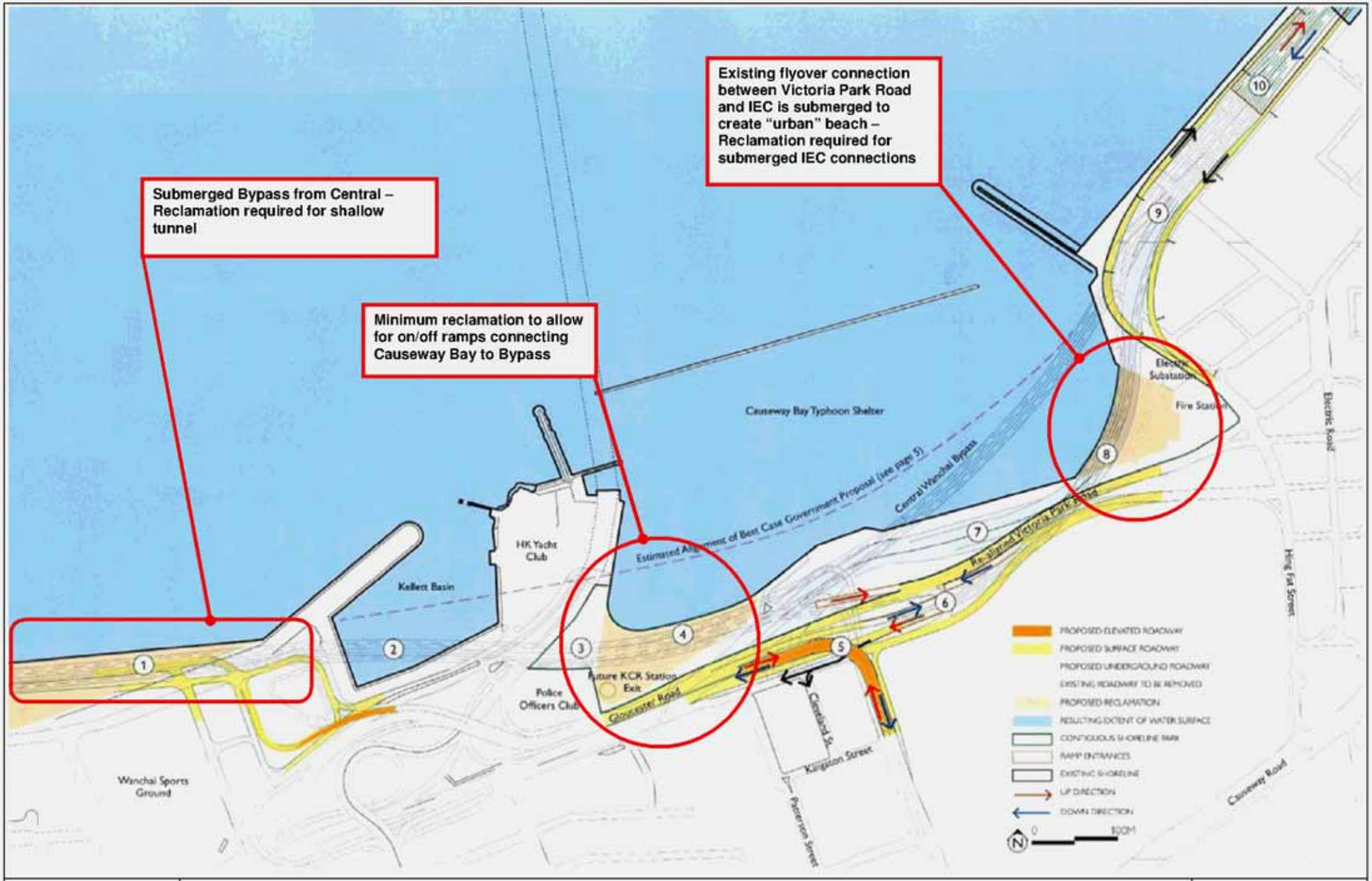
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

ALTERNATIVE TUNNEL OPTION AT NORTH POINT

FIGURE 3.7

(C-DII D:/PROJECTS/97103/DRAWING/REPORT/HEC COMBINED PAPER 1/FIG3.7.DGN/MAR, 06/SCALE 1 A4) %7000



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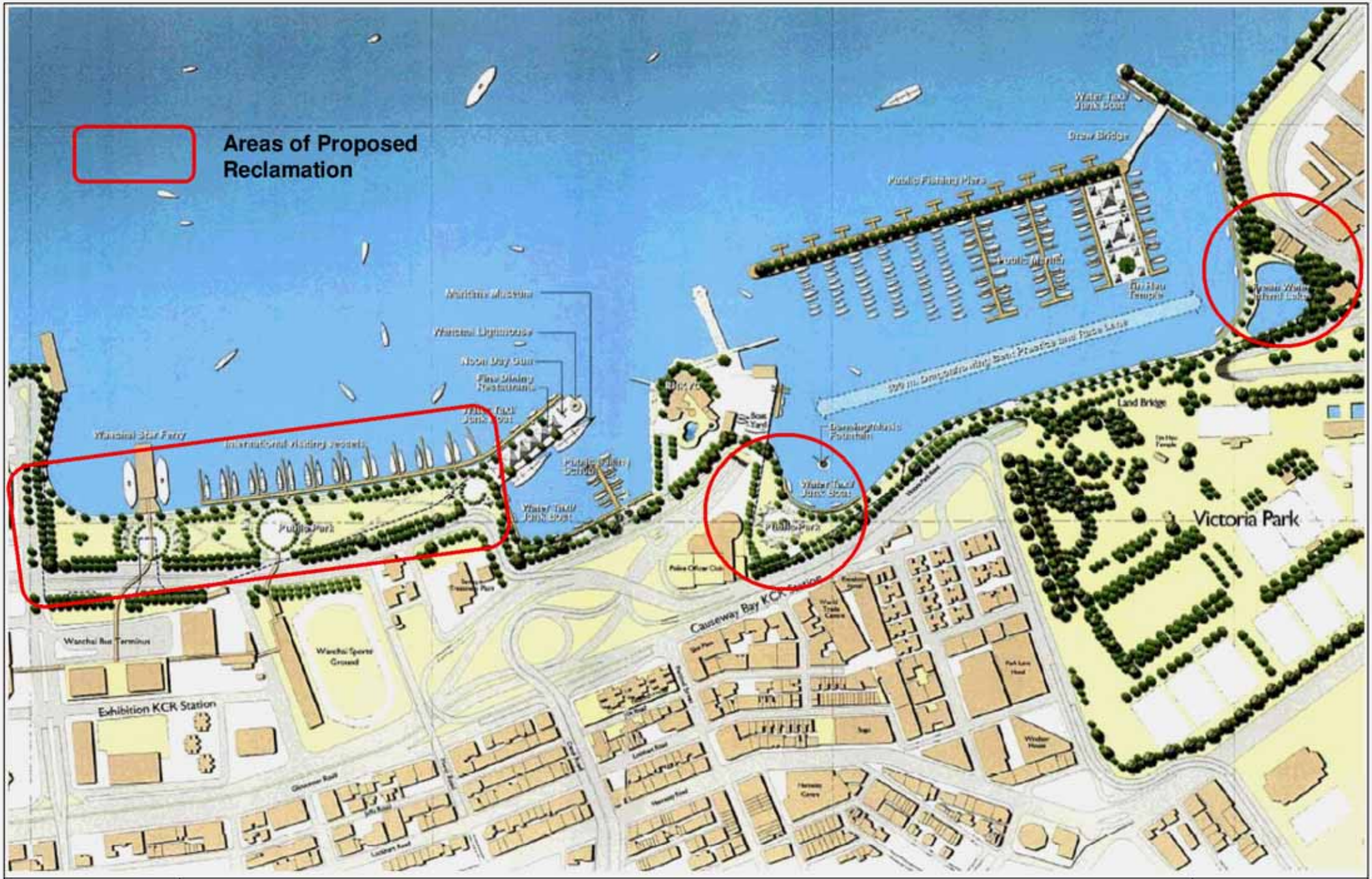
WAN CHAI DEVELOPMENT PHASE II – PLANNING AND ENGINEERING REVIEW

PUBLIC SUBMISSION: SWIRES – RECLAMATION REQUIREMENTS

FIGURE 3.8



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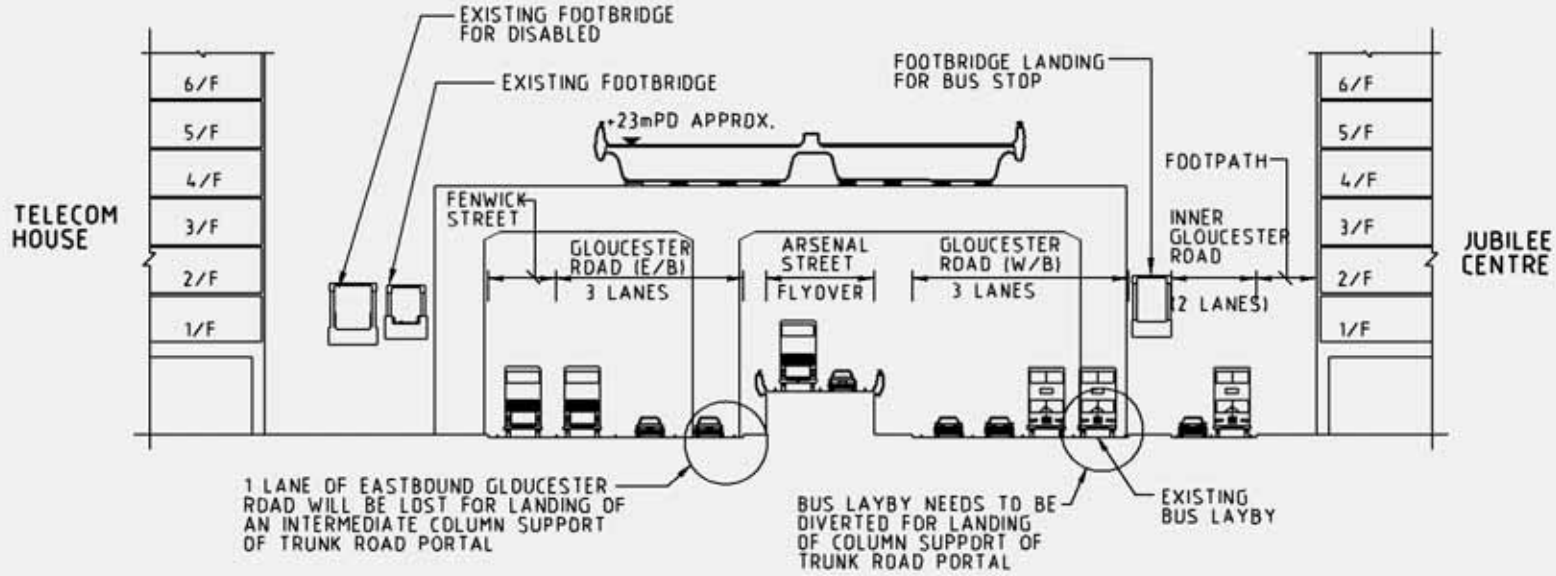
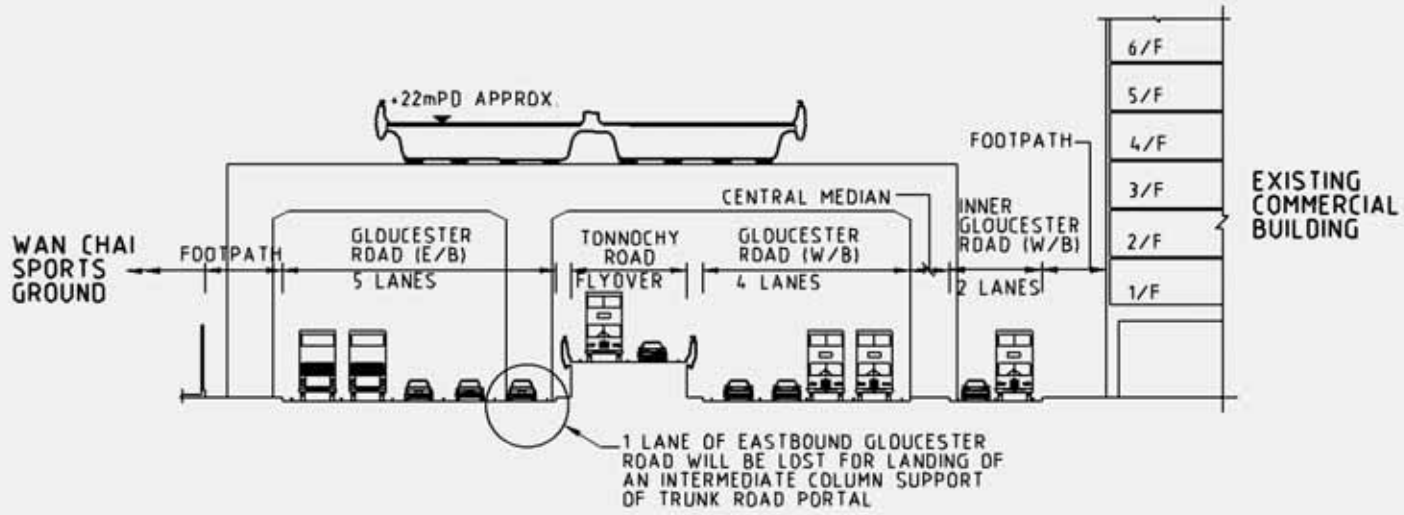
WAN CHAI DEVELOPMENT PHASE II – PLANNING AND ENGINEERING REVIEW

PUBLIC SUBMISSION: RHKYC – RECLAMATION REQUIREMENTS

FIGURE 3.9



CROSS-SECTION OF GLOUCESTER ROAD ADJACENT TO TELECOM HOUSE
WITH DOUBLE-DECKING OF TRUNK ROAD ELEVATED STRUCTURE
SCALE 1 : 500



CROSS-SECTION OF GLOUCESTER ROAD ADJACENT TO WAN CHAI SPORTS GROUND
WITH DOUBLE-DECKING OF TRUNK ROAD ELEVATED STRUCTURE
SCALE 1 : 500

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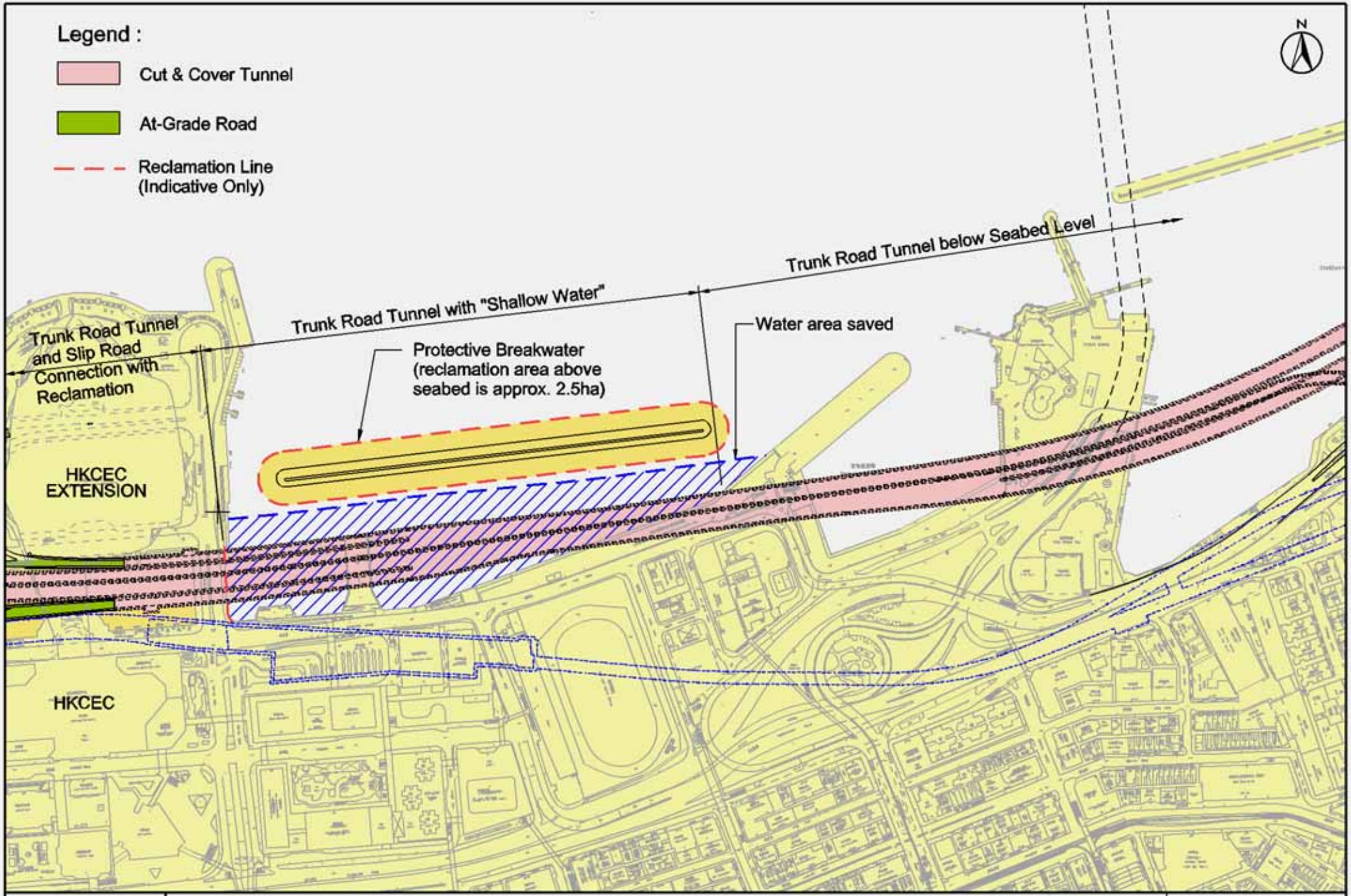
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

ILLUSTRATIVE SECTION SHOWING "DOUBLE-DECK" TRUNK ROAD IDEA

FIGURE 3.10

ISZ01 $FILE$



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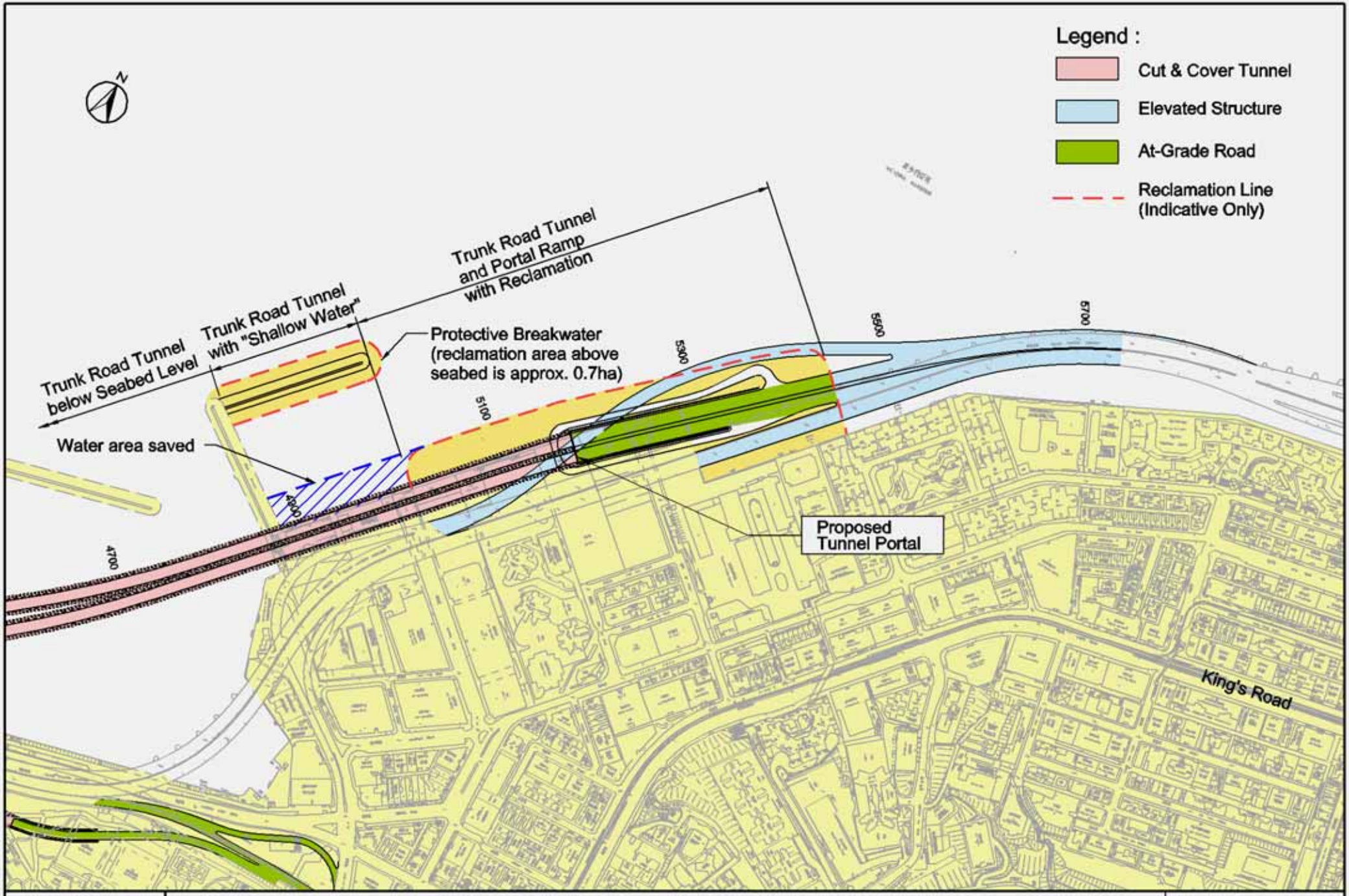
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

ILLUSTRATION OF "SHALLOW WATER" TRUNK ROAD IDEA - WAN CHAI

FIGURE 3.11

ISZ01 $FILE$



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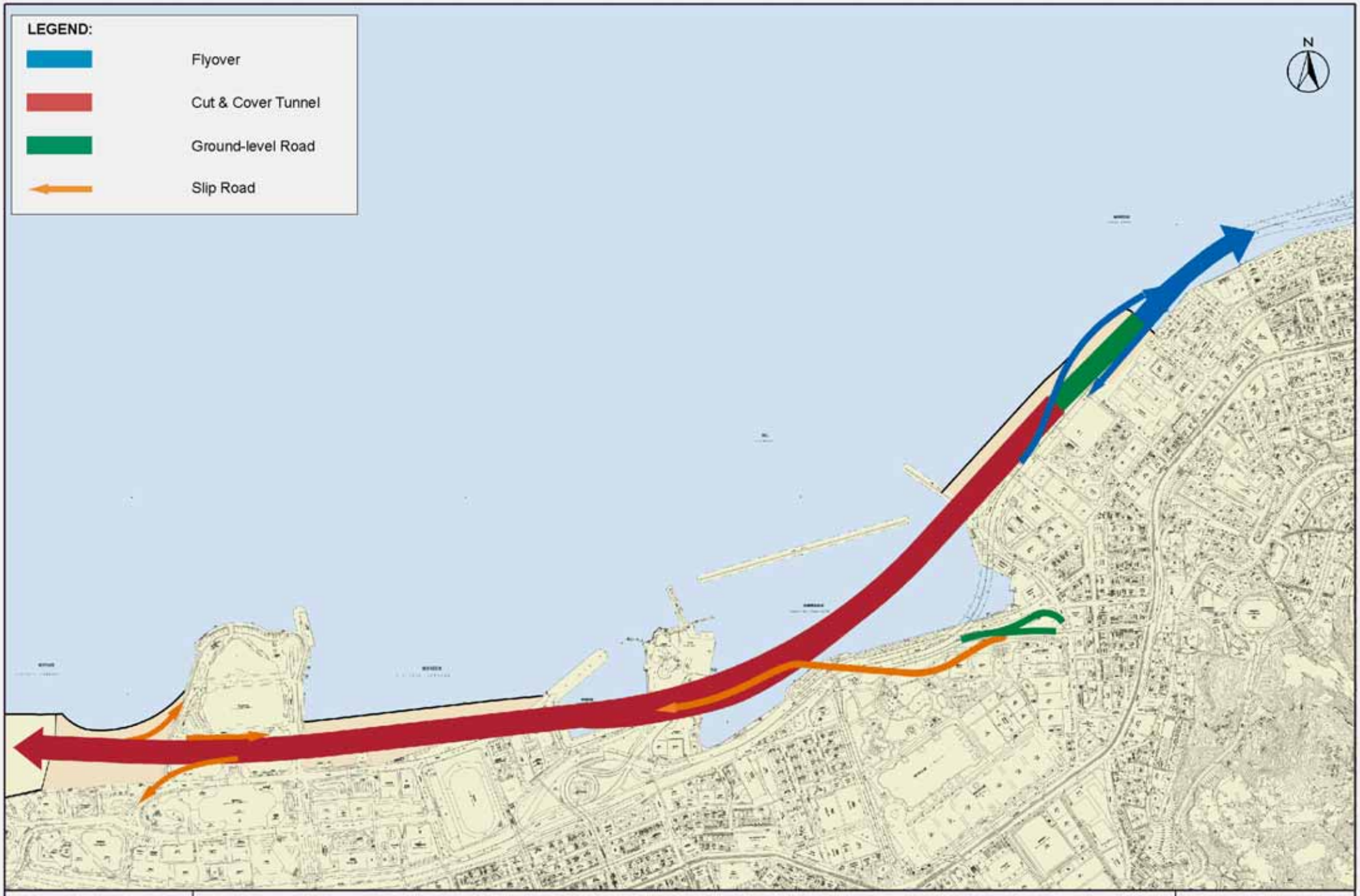
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

ILLUSTRATION OF "SHALLOW WATER" TRUNK ROAD IDEA - NORTH POINT

FIGURE 3.12

ISZ01 $FILE$



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WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

TRUNK ROAD TUNNEL VARIATION 1

FIGURE 4.1

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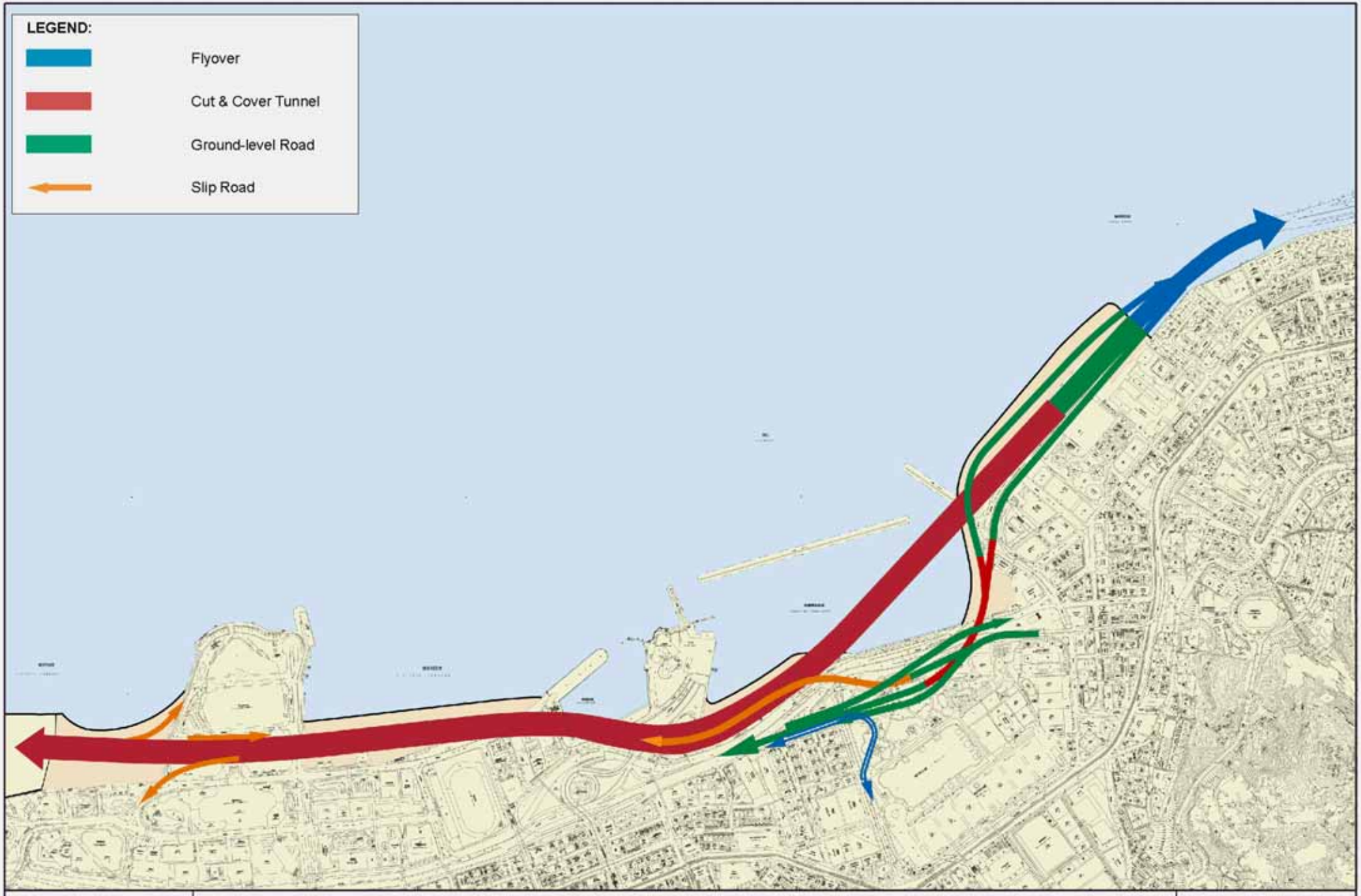
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

CONSOLIDATED HARBOUR - FRONT & TRUNK ROAD TUNNEL (VARIATION 1)

FIGURE 4.2



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WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

TRUNK ROAD TUNNEL VARIATION 2

FIGURE 4.3

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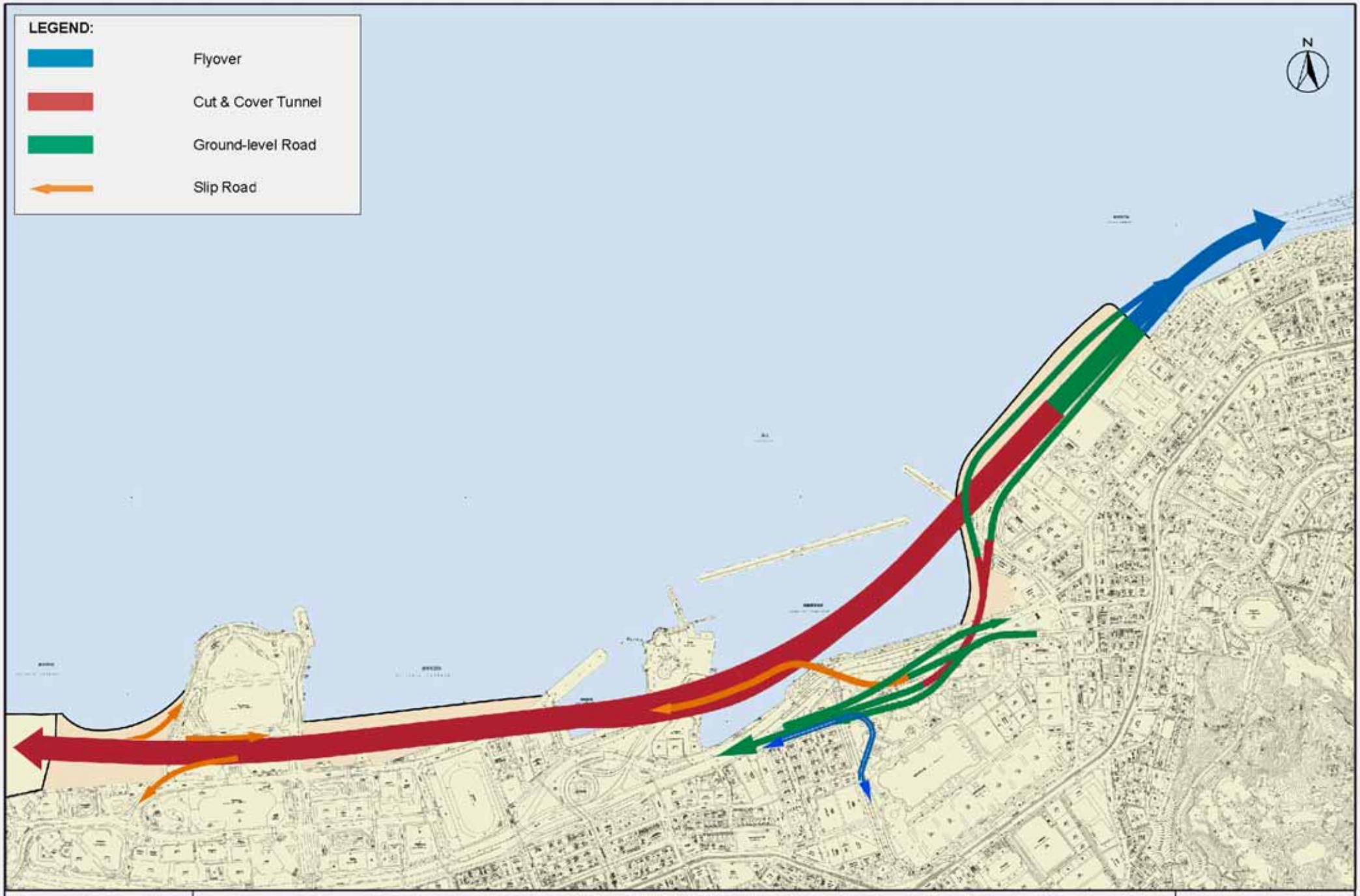
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

CONSOLIDATED HARBOUR - FRONT & TRUNK ROAD TUNNEL (VARIATION 2)

FIGURE 4.4



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WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

TRUNK ROAD TUNNEL VARIATION 3

FIGURE 4.5

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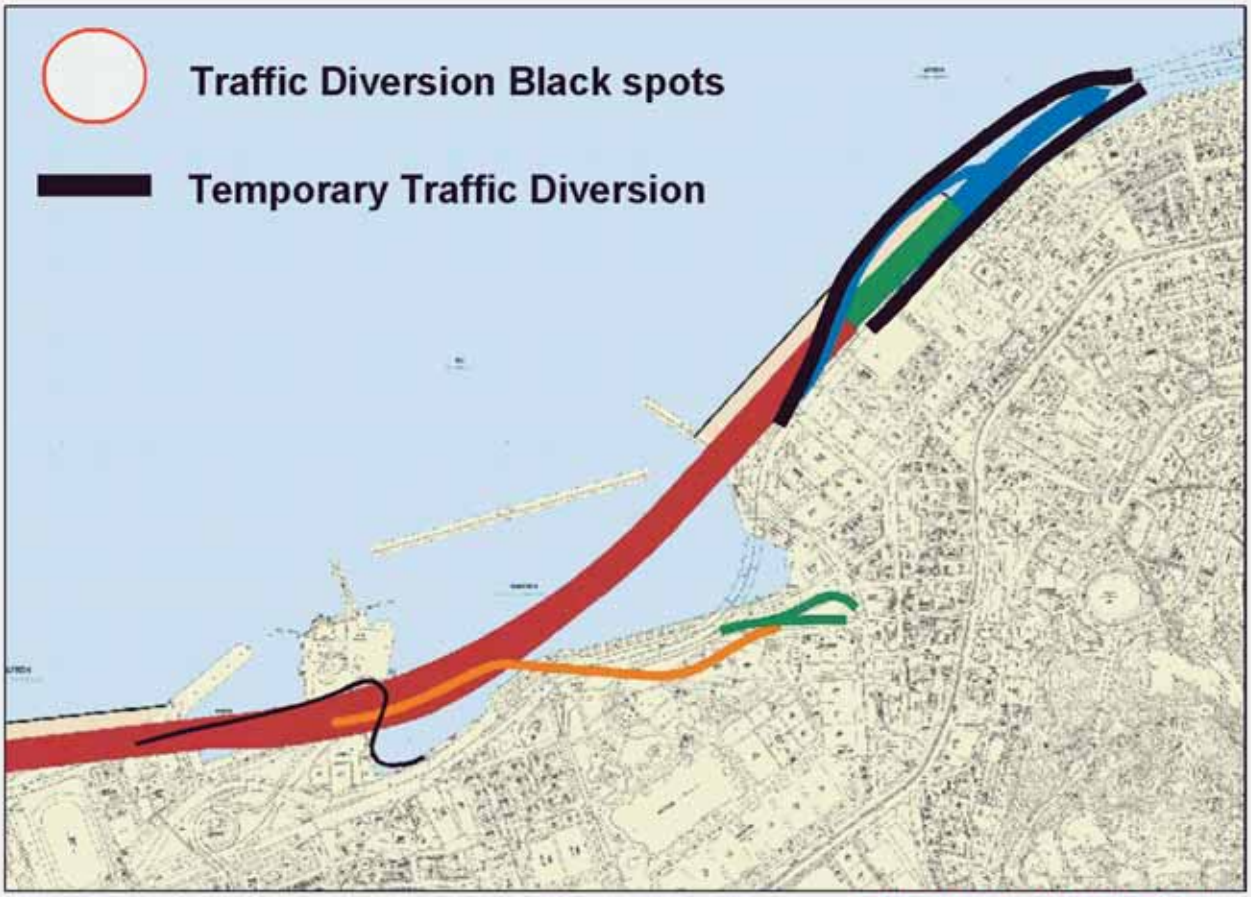
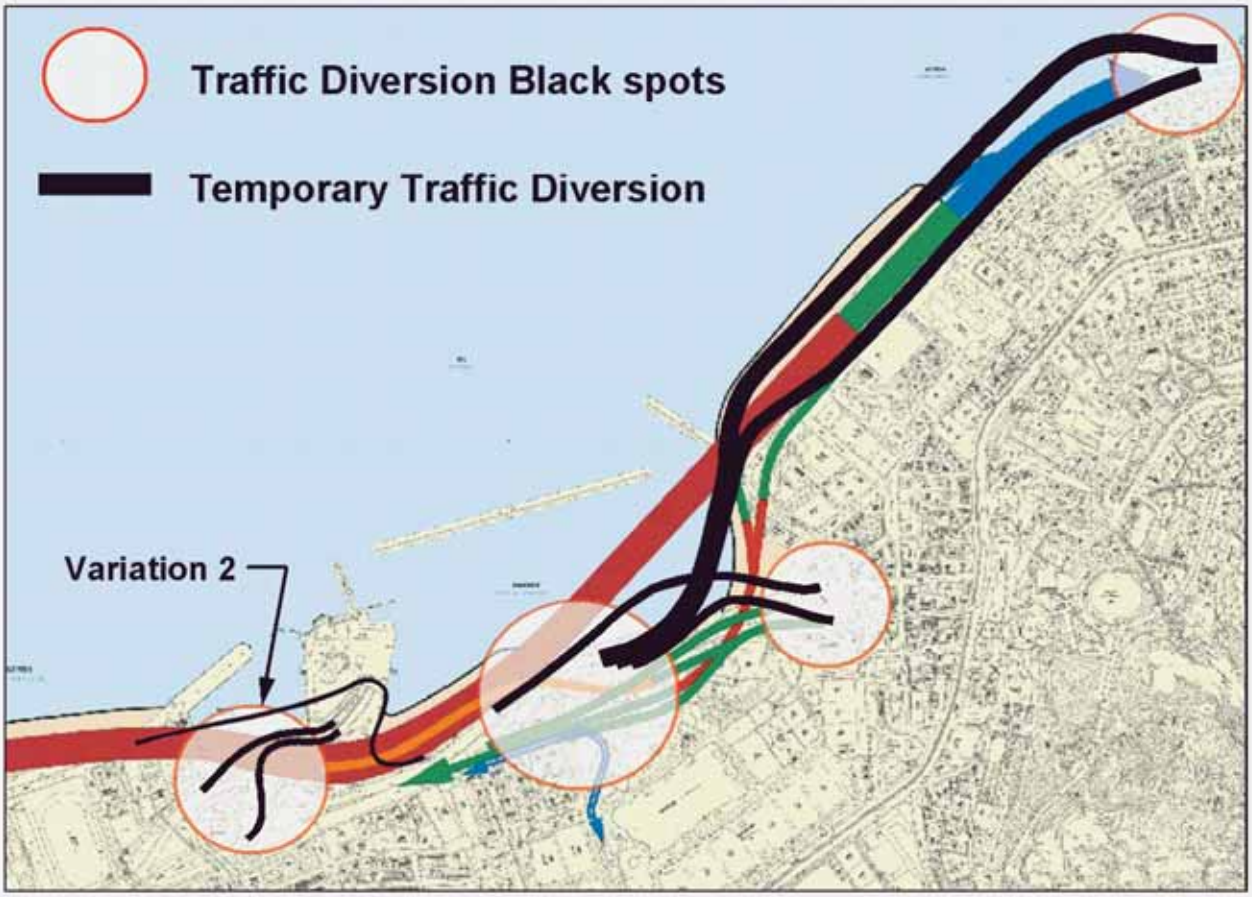
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

CONSOLIDATED HARBOUR - FRONT & TRUNK ROAD TUNNEL (VARIATION 3)

FIGURE 4.6



TUNNEL VARIATION 1



TUNNEL VARIATIONS 2 & 3

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WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

EXTENT OF TEMPORARY ROAD DIVERSIONS

FIGURE 4.7

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WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

INTRUSION INTO VICTORIA PARK – TUNNEL VARIATIONS 2 & 3

FIGURE 4.8

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WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

TRUNK ROAD FLYOVER

FIGURE 4.9

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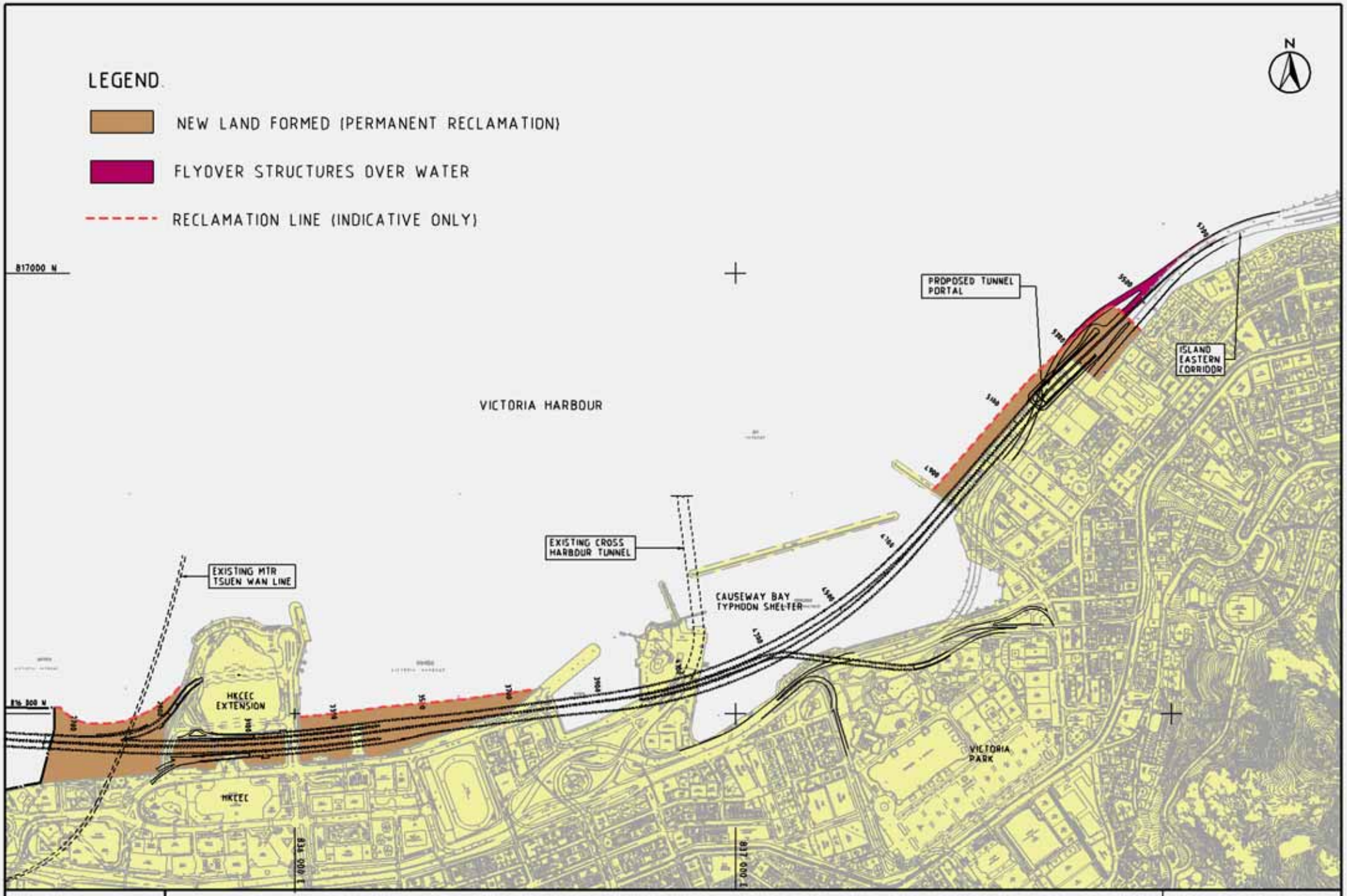
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

CONSOLIDATED HARBOUR - FRONT & TRUNK ROAD FLYOVER

FIGURE 4.10



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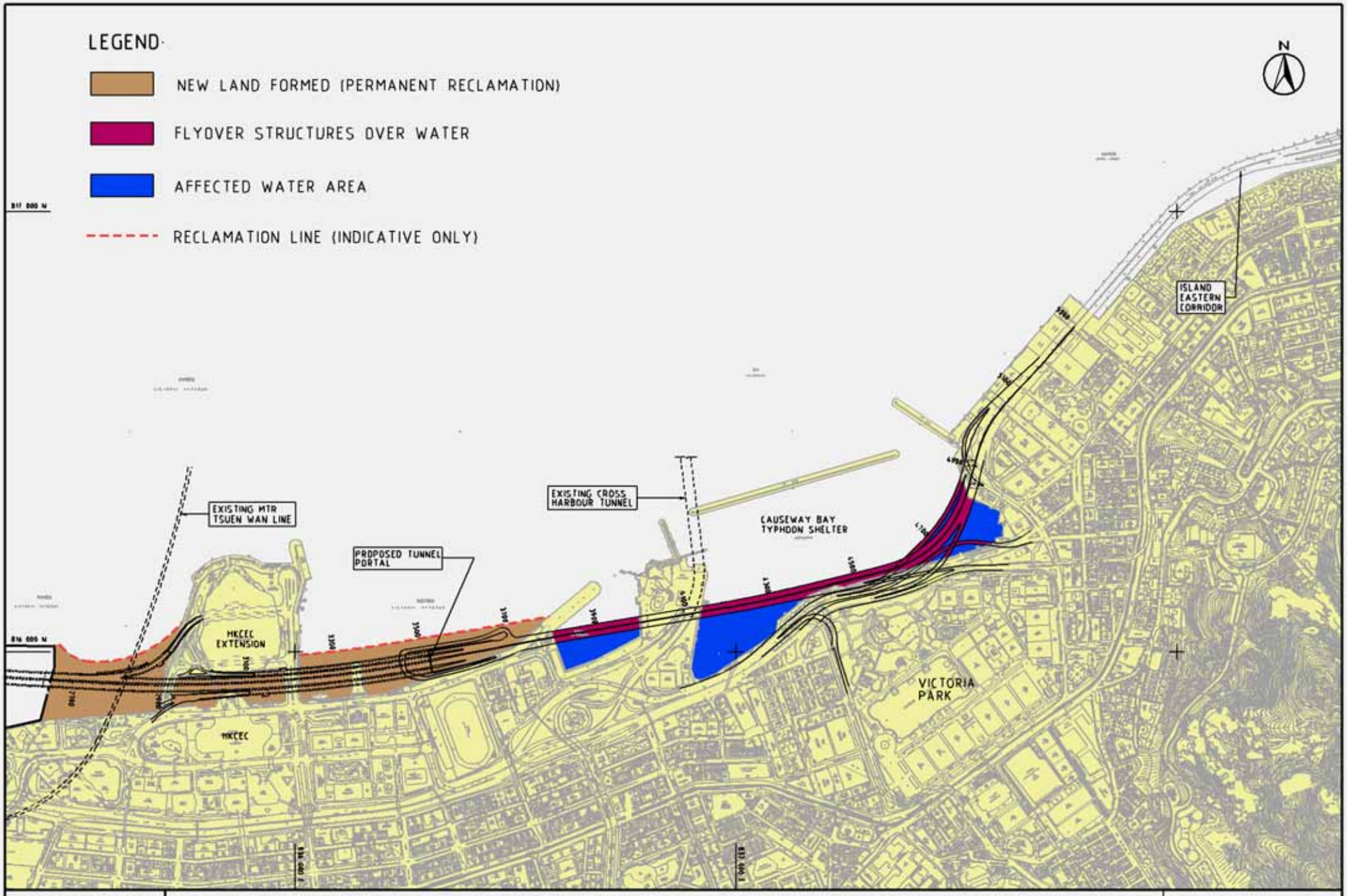
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

AFFECTED AREAS OF THE HARBOUR - TUNNEL

FIGURE 4.11

IC-D11 Q:/PROJECTS/97103/DRAWING/REPORT/HEC COMBINED PAPER 1/FIG4.11.DGN/MAR. 06/SCALE 1:8000



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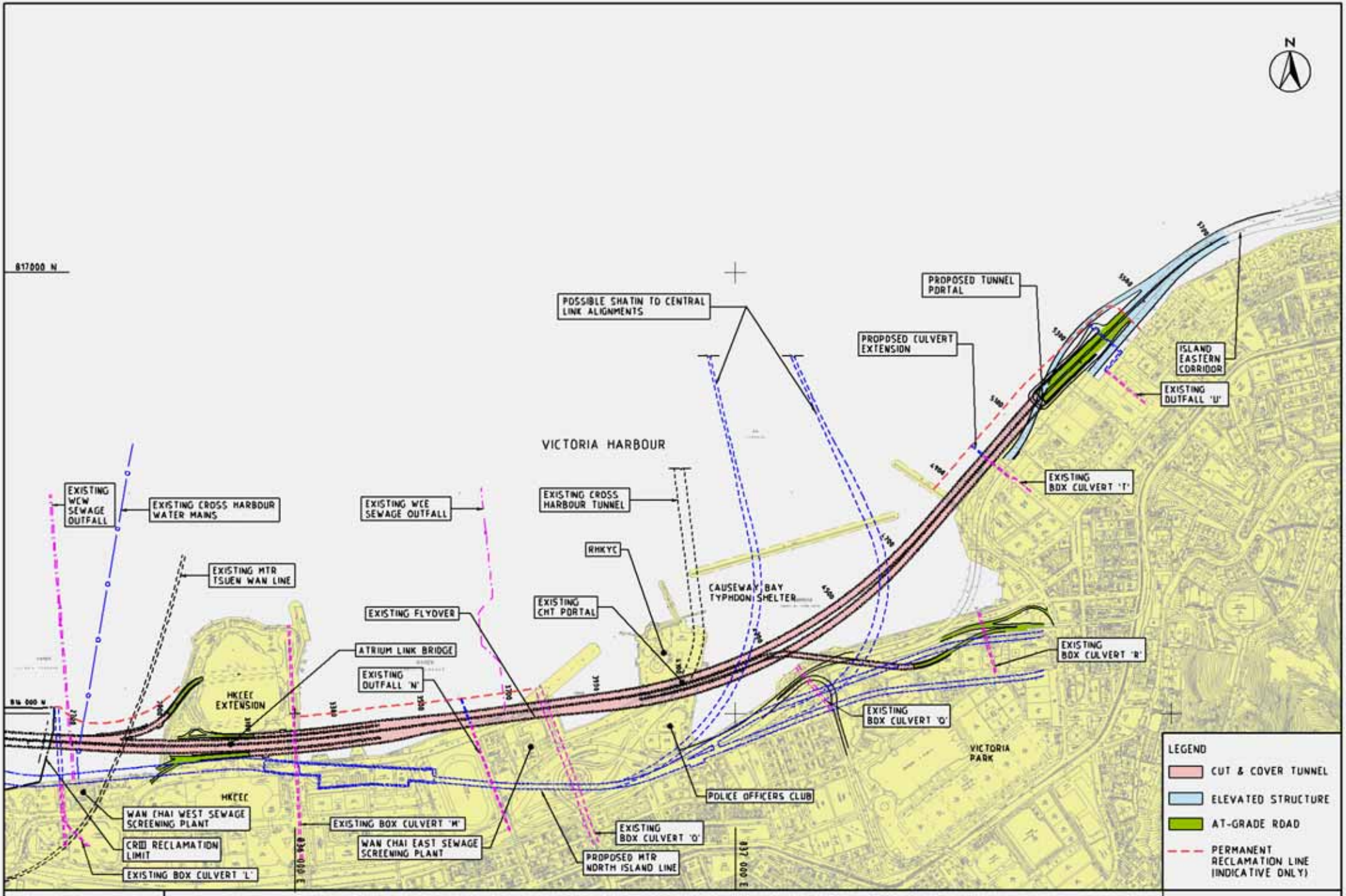
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

AFFECTED AREAS OF THE HARBOUR - FLYOVER

FIGURE 4.12

IE-011 D:/PROJECTS/97103/DRAWING/REPORT/HEC COMBINED PAPER 1/FIG4.12.DGN/MAR. 06/SCALE 1.8000



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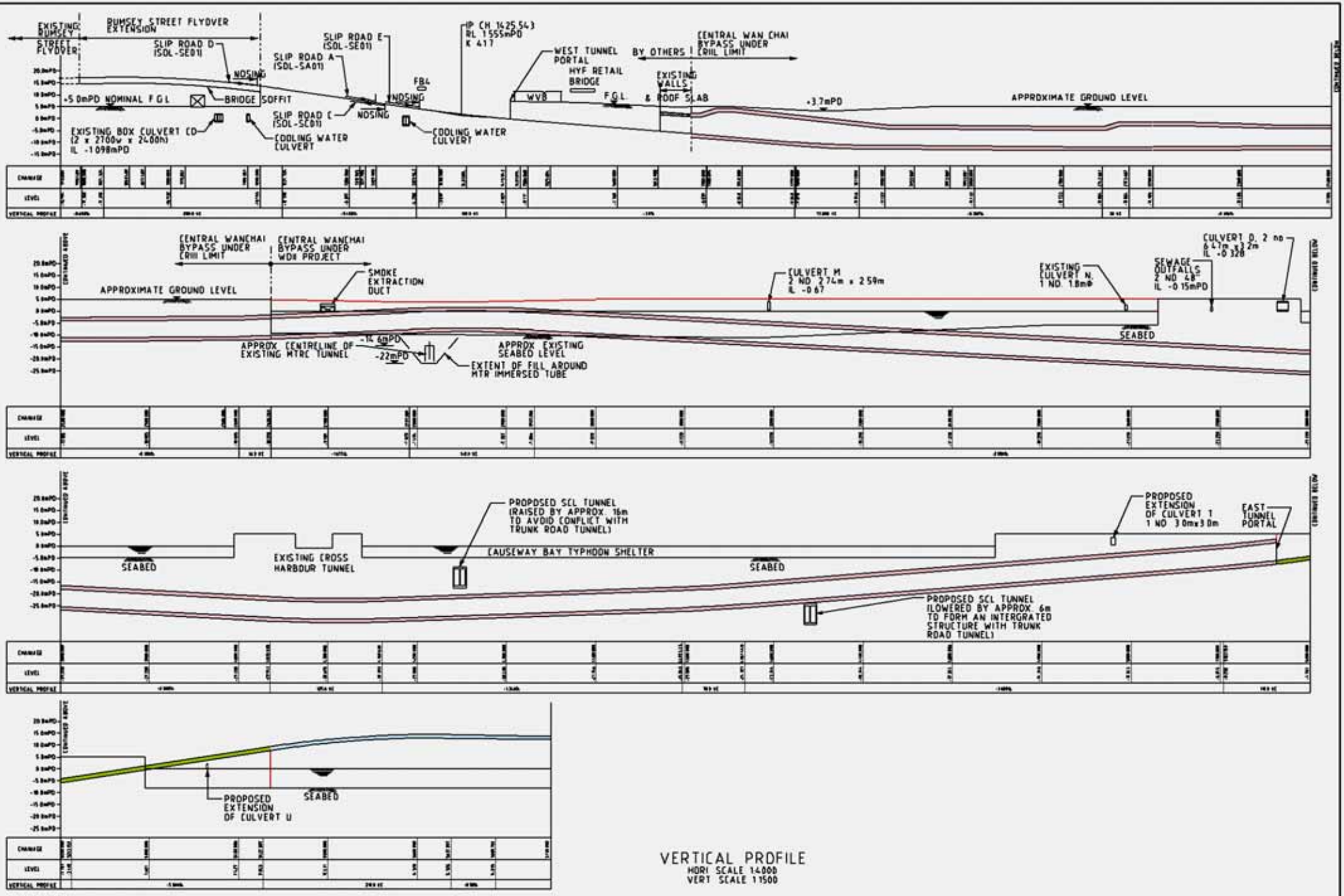
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

TRUNK ROAD TUNNEL OPTION

FIGURE 4.13

ISZDI $FILES



VERTICAL PROFILE
HORI SCALE 1:1000
VERT SCALE 1:1500

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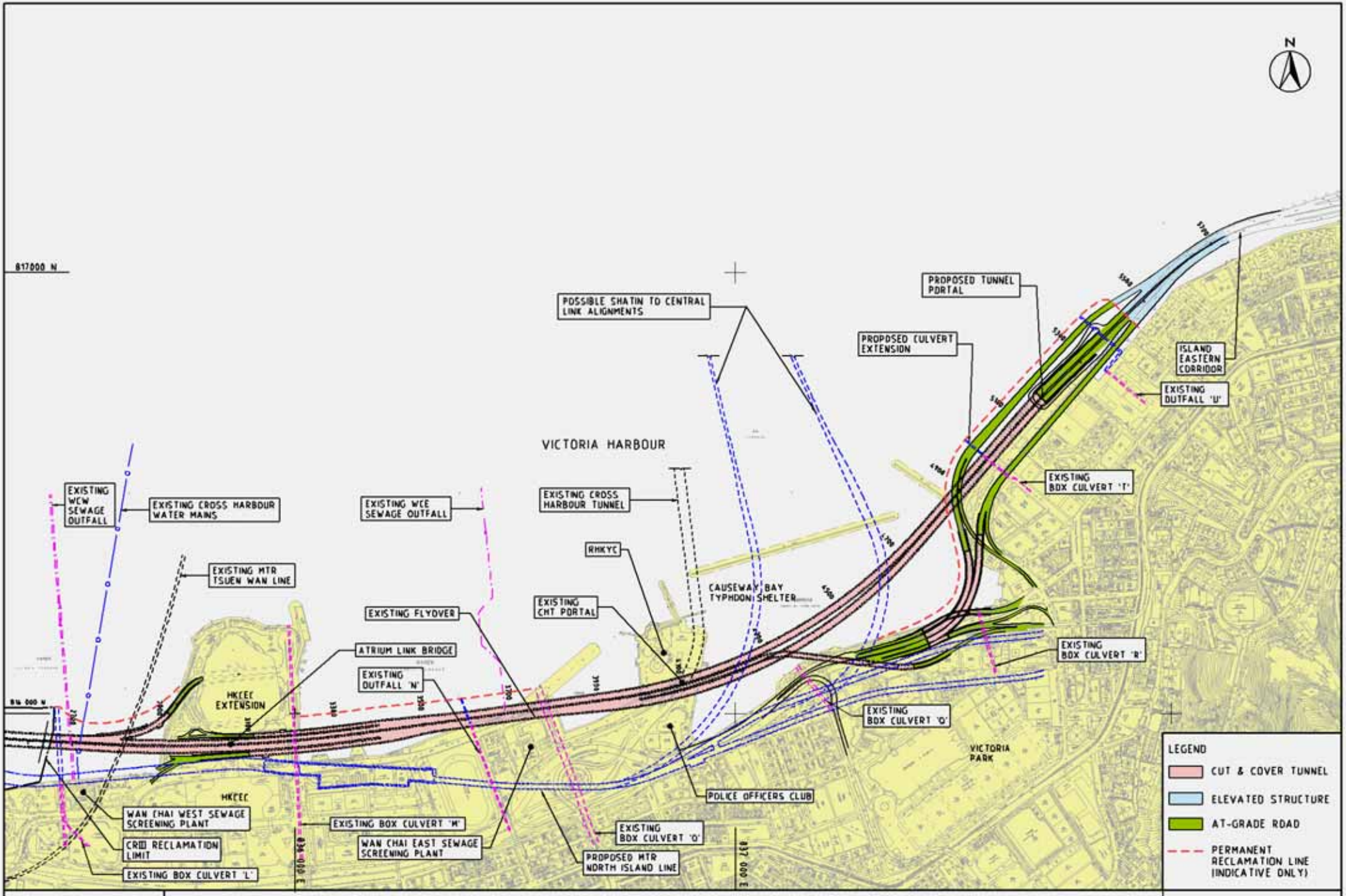
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

TRUNK ROAD TUNNEL OPTION - VERTICAL PROFILE

FIGURE 4.14

I5201 $FILE$



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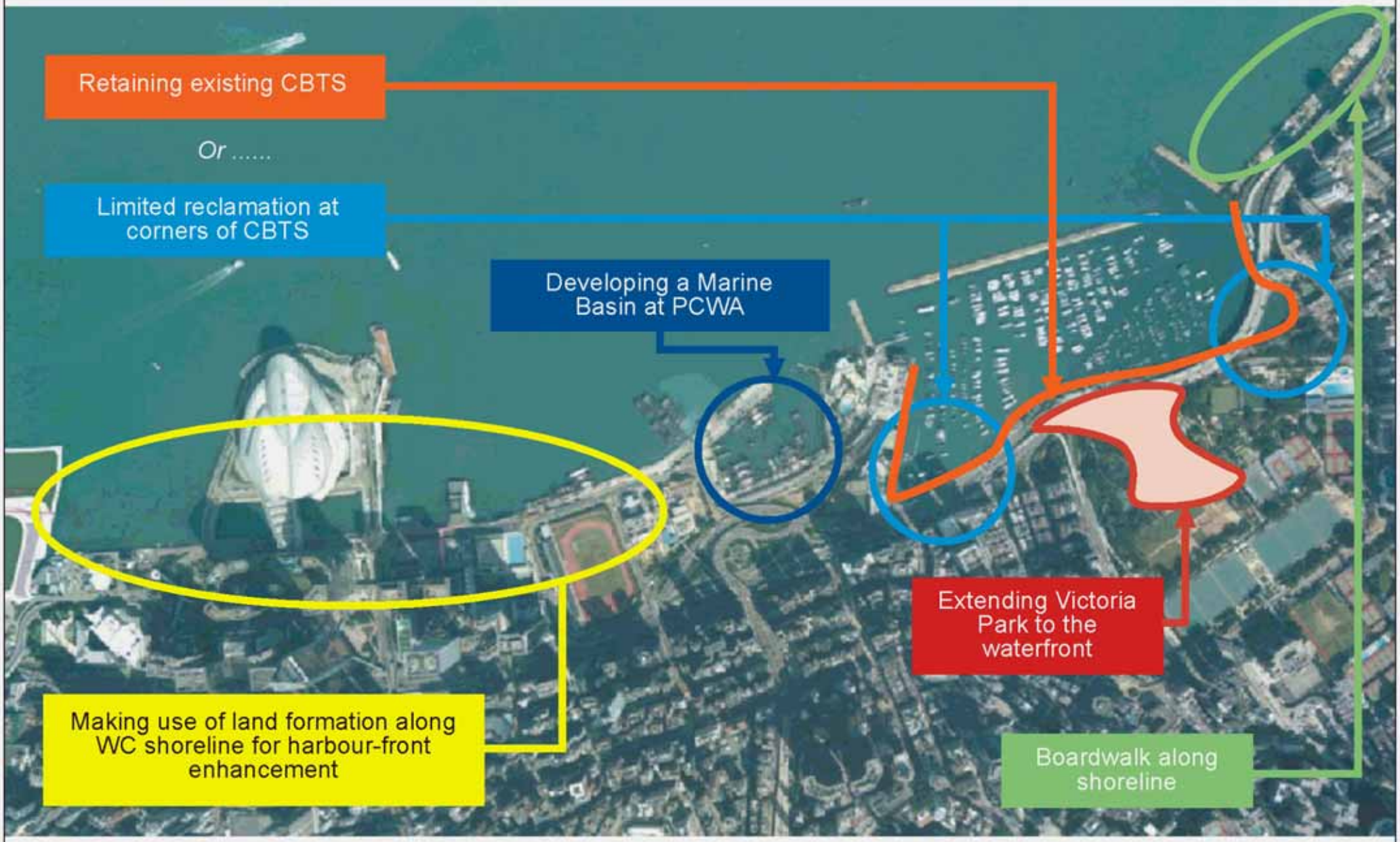
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

MODIFICATION OF TRUNK ROAD TUNNEL OPTION FOR FUTURE SUBMERGING OF IEC

FIGURE 4.15

IC-011 Q:/PROJECTS/9710J/DRAWING/REPORT/HEC COMBINED PAPER 1/FIG4.15.DGN/MAR. 06/SCALE 1.8000



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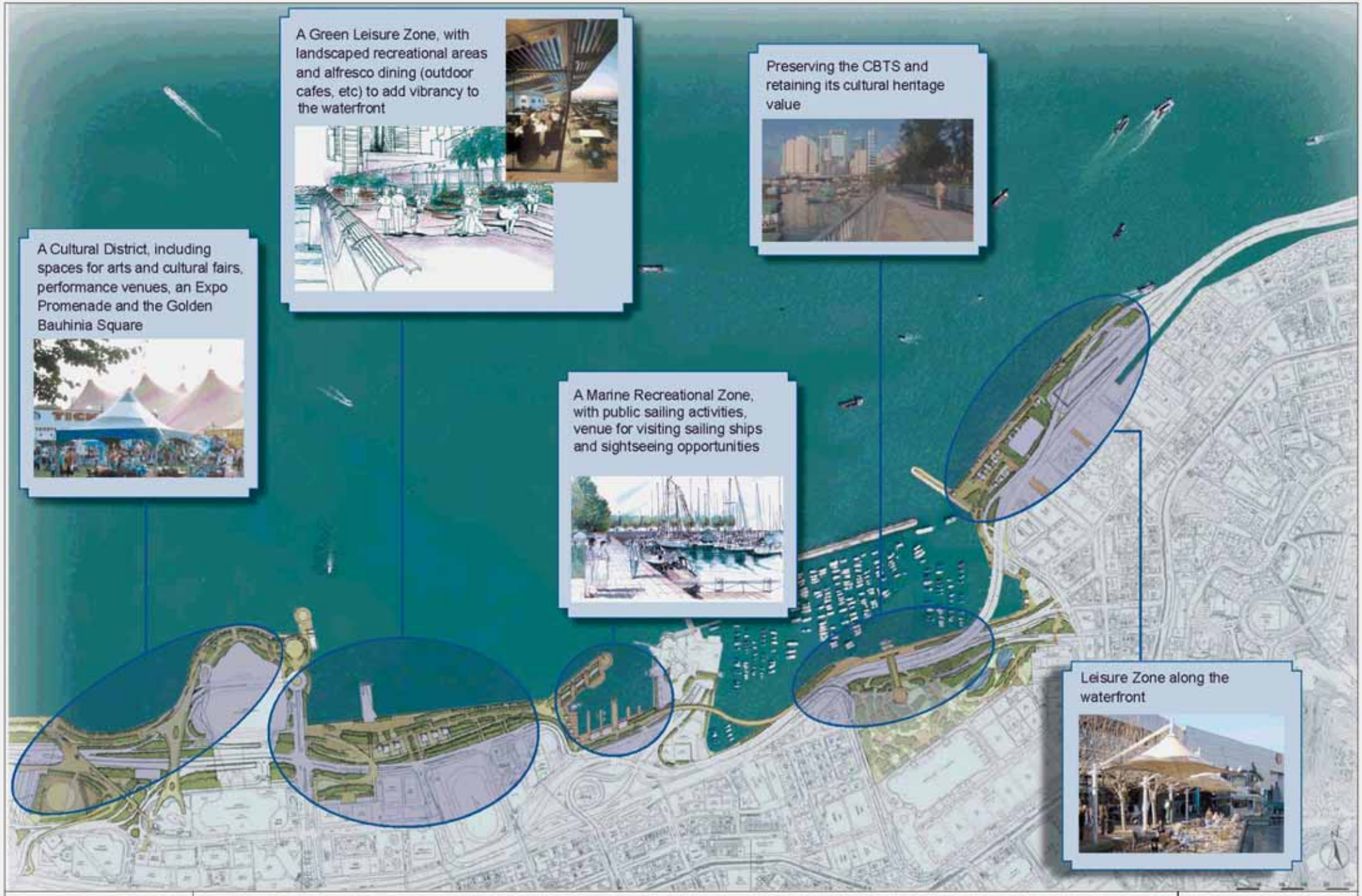
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

PROPOSED HARBOUR-FRONT ENHANCEMENT IDEAS

FIGURE 5.1



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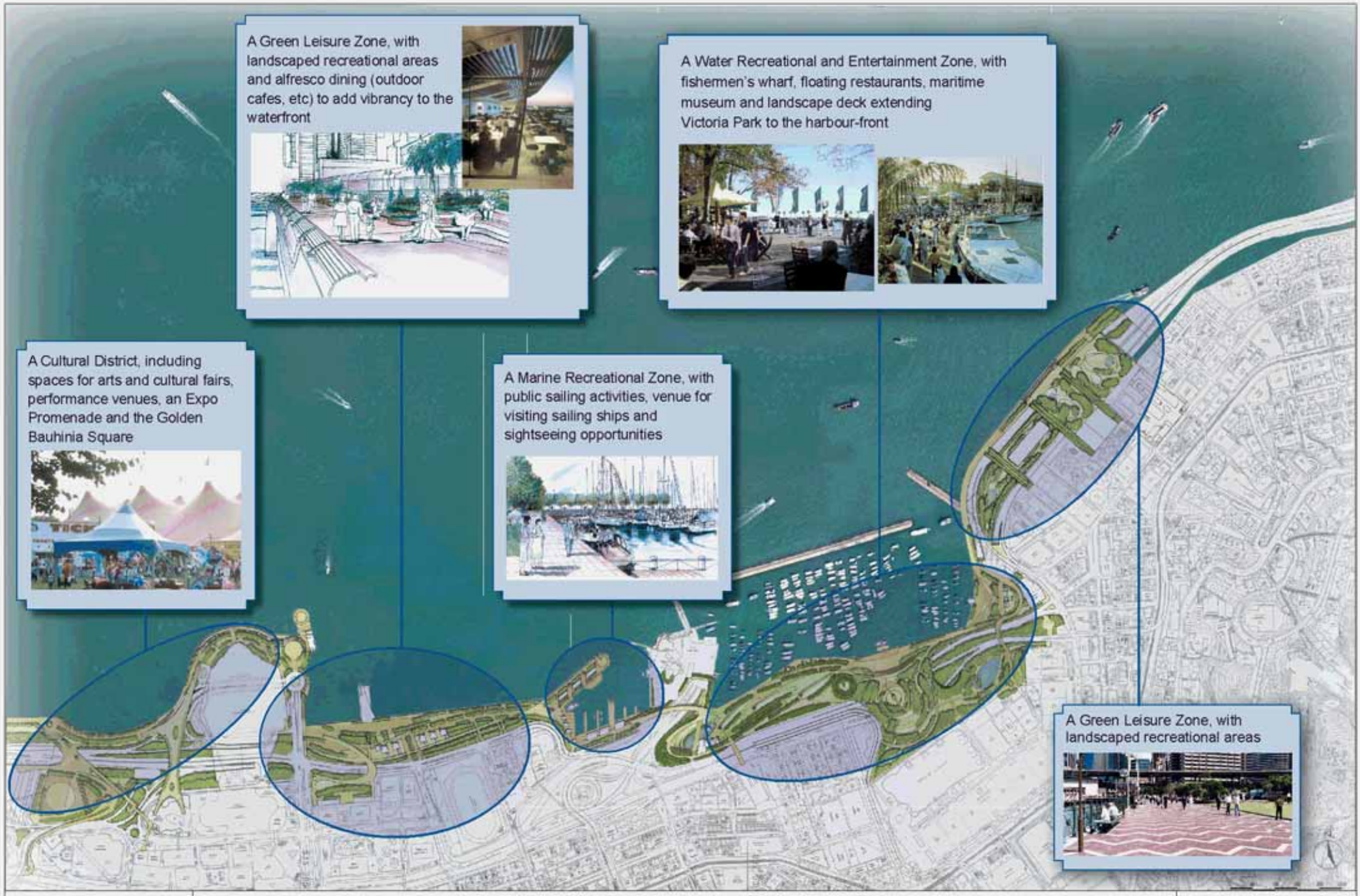
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

CONSOLIDATED HARBOUR - FRONT ENHANCEMENT IDEAS WITH TRUNK ROAD TUNNEL (VARIATION 1)

FIGURE 5.2



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WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

CONSOLIDATED HARBOUR - FRONT ENHANCEMENT IDEAS WITH TRUNK ROAD TUNNEL (VARIATION 2)

FIGURE 5.3

A Green Leisure Zone, with landscaped recreational areas and alfresco dining (outdoor cafes, etc) to add vibrancy to the waterfront

A Water Recreational and Entertainment Zone, with fishermen's wharf, floating restaurants and landscape deck extending Victoria Park to the harbour-front

A Cultural District, including spaces for arts and cultural fairs, performance venues, an Expo Promenade and the Golden Bauhinia Square

A Marine Recreational Zone, with public sailing activities, venue for visiting sailing ships and sightseeing opportunities

A Green Leisure Zone, with landscaped recreational areas

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WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

CONSOLIDATED HARBOUR - FRONT ENHANCEMENT IDEAS WITH TRUNK ROAD TUNNEL (VARIATION 3)

FIGURE 5.4

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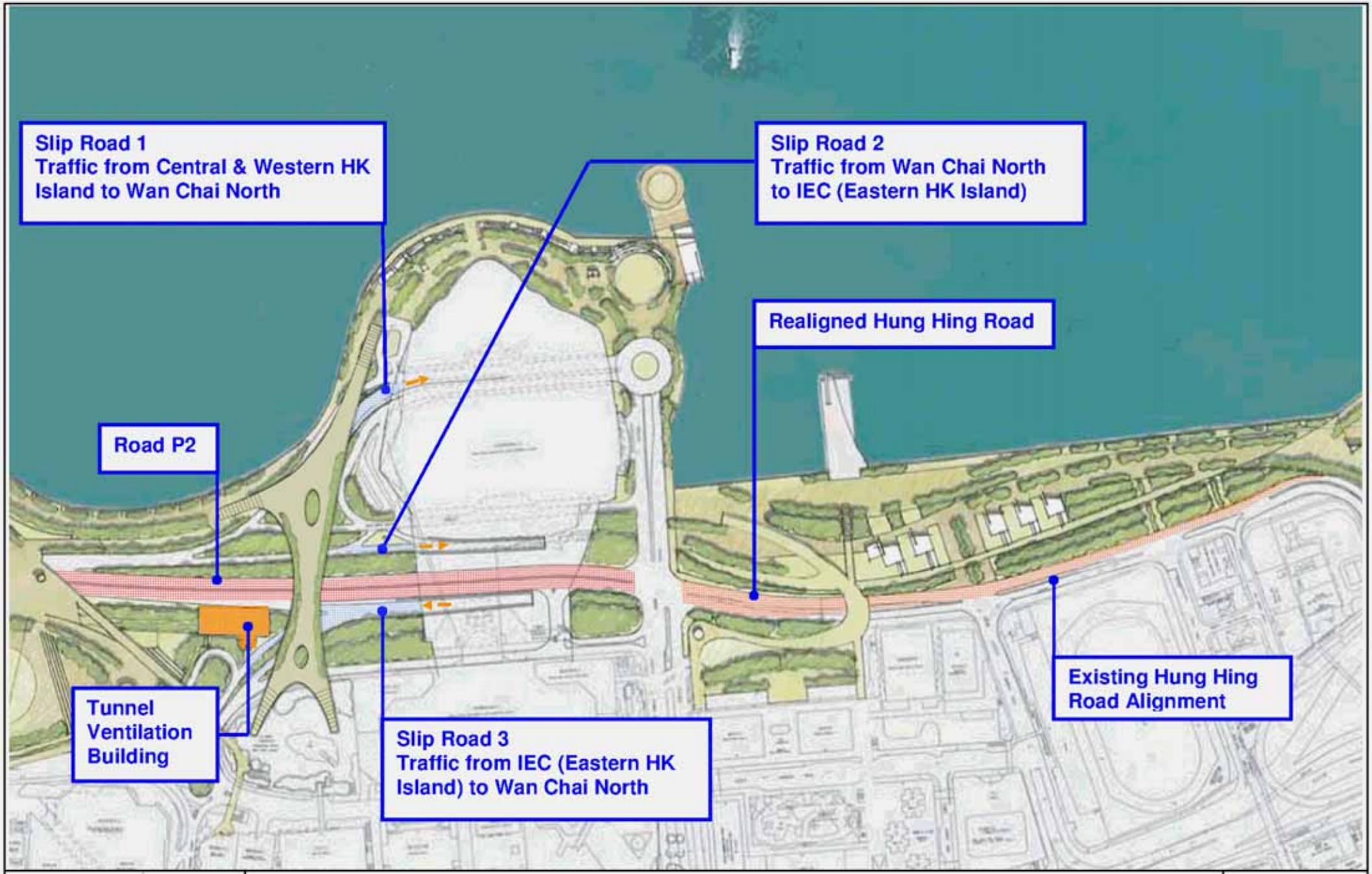
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

CONSOLIDATED HARBOUR - FRONT ENHANCEMENT IDEAS WITH TRUNK ROAD FLYOVER

FIGURE 5.5



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WAN CHAI DEVELOPMENT PHASE II – PLANNING AND ENGINEERING REVIEW

TUNNEL VENTILATION BUILDING, ROAD P2 & SLIP ROADS IN WAN CHAI NORTH

FIGURE 6.1

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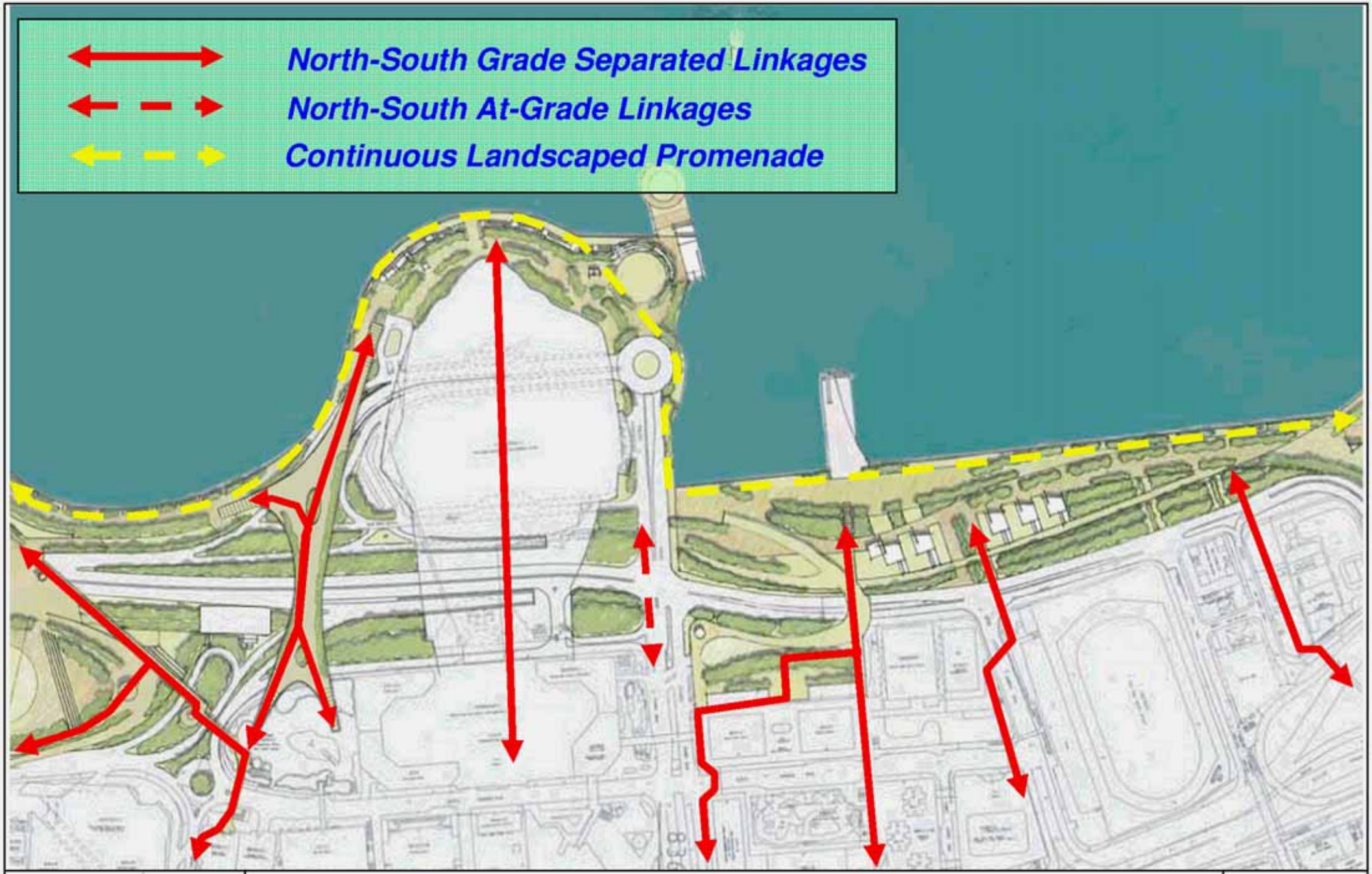
WAN CHAI DEVELOPMENT PHASE II – PLANNING AND ENGINEERING REVIEW

TUNNEL VENTILATION BUILDING & SLIP ROAD IN CAUSEWAY BAY

FIGURE 6.2



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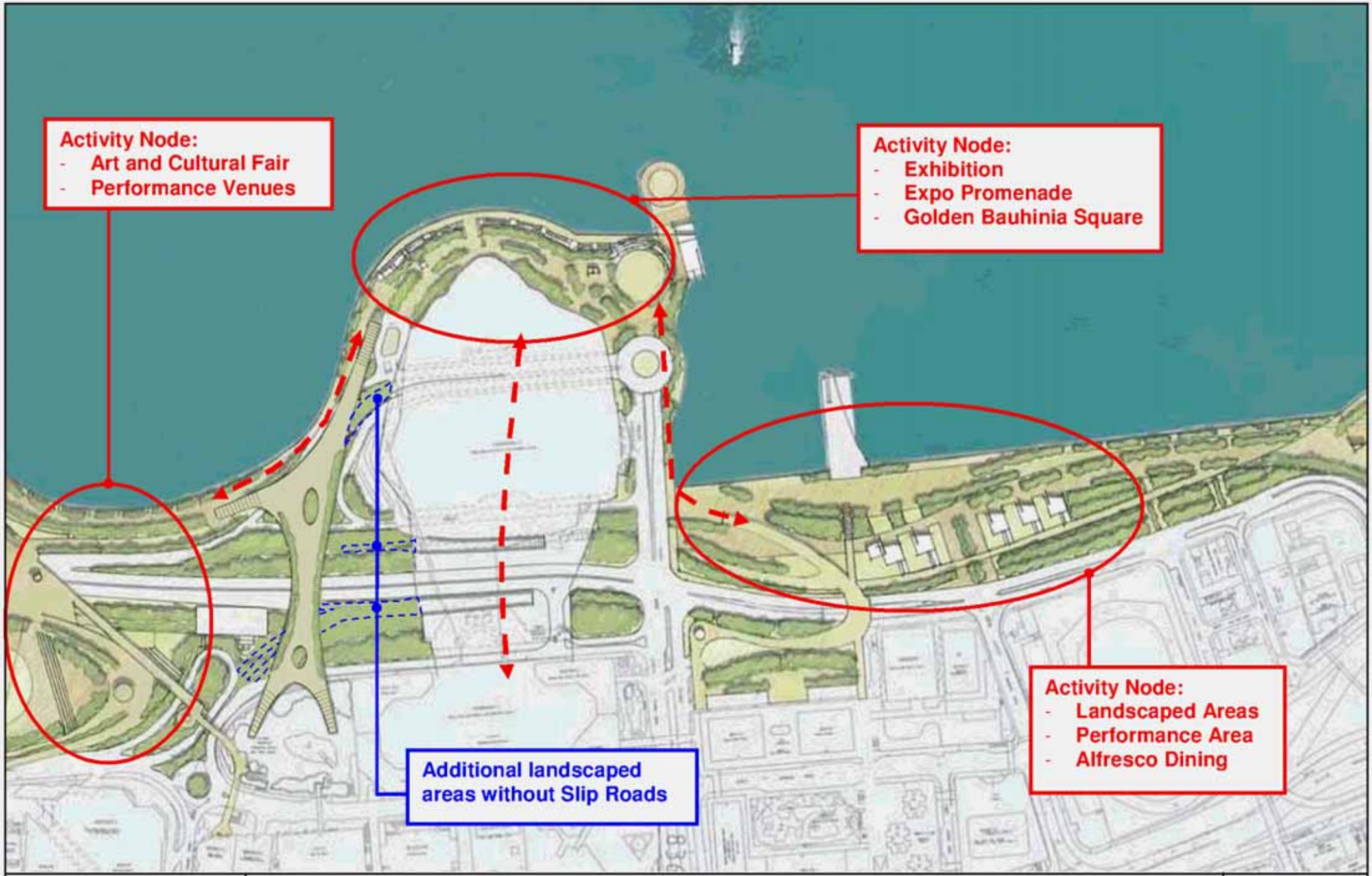
WAN CHAI DEVELOPMENT PHASE II – PLANNING AND ENGINEERING REVIEW

HARBOUR-FRONT ACCESSIBILITY IN WAN CHAI NORTH

FIGURE 6.3



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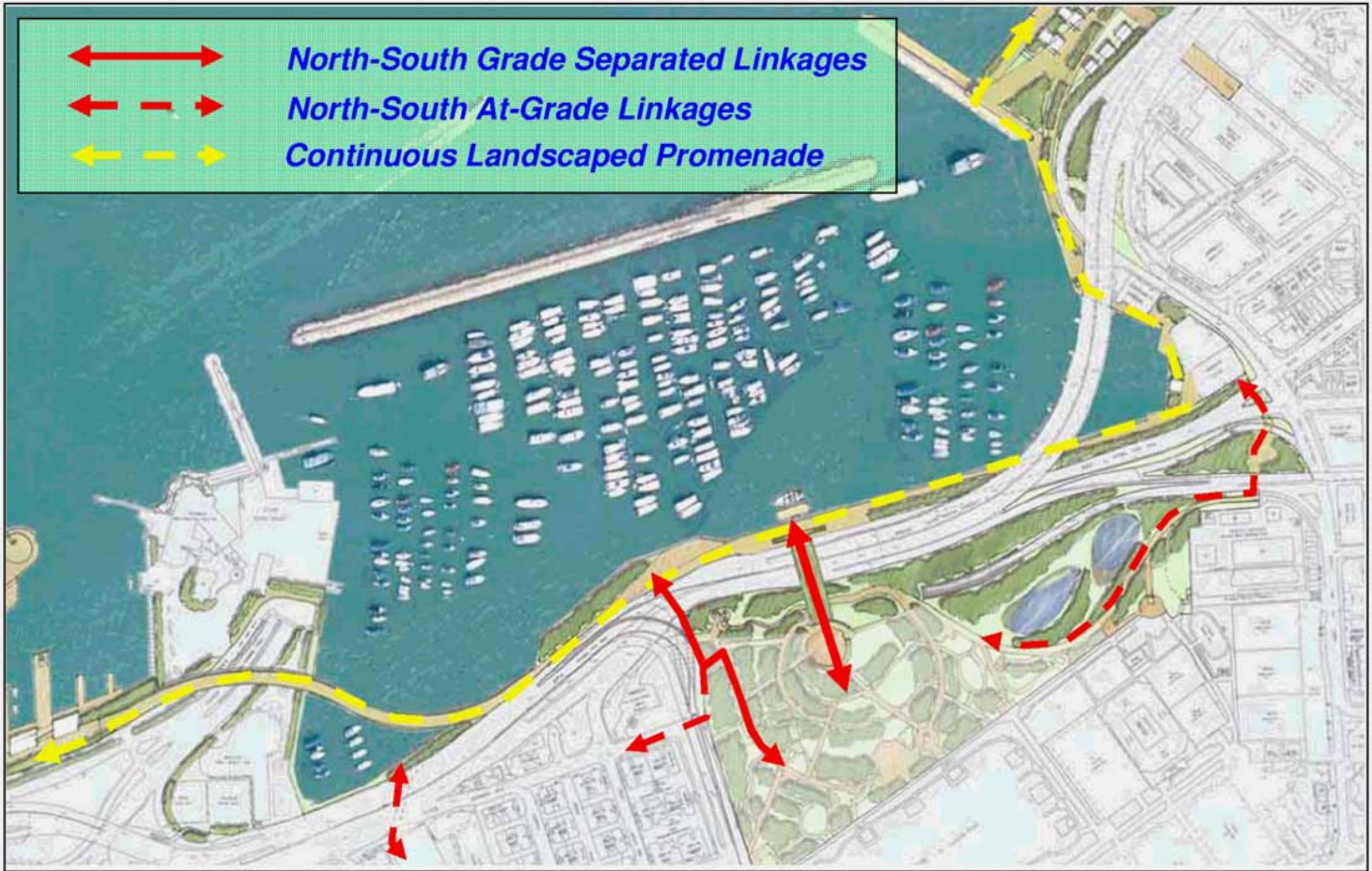
WAN CHAI DEVELOPMENT PHASE II – PLANNING AND ENGINEERING REVIEW

EFFECTS OF DELETING SLIP ROADS IN WAN CHAI NORTH

FIGURE 6.4



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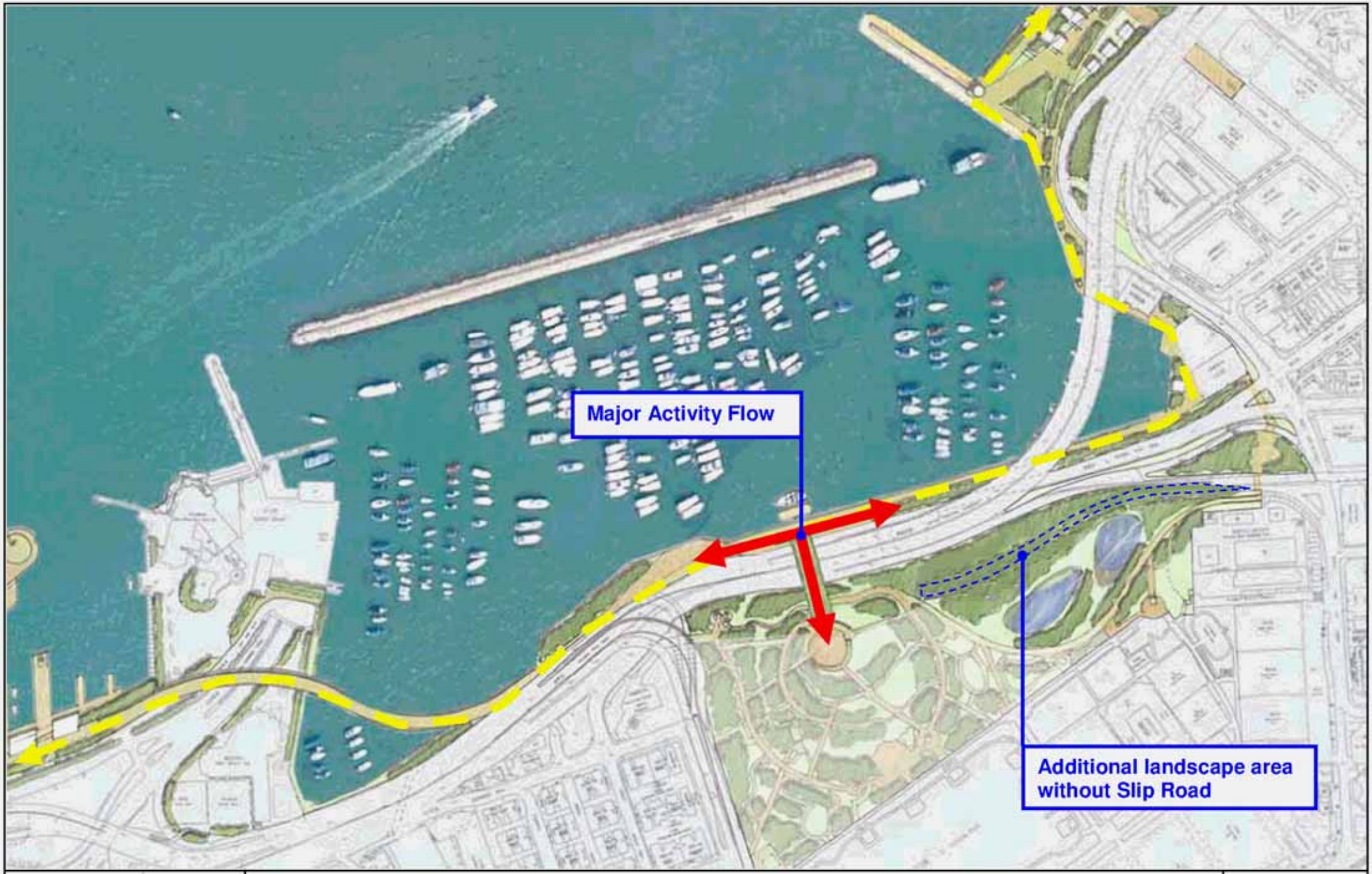
WAN CHAI DEVELOPMENT PHASE II – PLANNING AND ENGINEERING REVIEW

HARBOUR-FRONT ACCESSIBILITY IN CAUSEWAY BAY

FIGURE 6.5



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WAN CHAI DEVELOPMENT PHASE II – PLANNING AND ENGINEERING REVIEW

EFFECTS OF DELETING SLIP ROAD IN CAUSEWAY BAY

FIGURE 6.6

SUMMARY OF REPORT ON TRUNK ROAD ALIGNMENTS & HARBOUR-FRONT ENHANCEMENT

INTRODUCTION

The Envisioning Stage of the "Harbour-front Enhancement Review – Wan Chai, Causeway Bay and Adjoining Areas" (HER) was completed in November 2005. Public engagement activities convened in this stage included: five public forums, two community design charrettes, opinion surveys, an Expert Panel Forum on Sustainable Transport Planning and Central-Wan Chai Bypass and a Consolidation Forum. These public engagement activities were well received by the public and valuable suggestions and ideas were received.

Generally speaking, there is consensus on the harbour-front enhancement ideas. Having considered the whole package of recommendations of the Expert Panel, the HEC Sub-committee on Wan Chai Development Phase II Review (Sub-committee) supported the construction of a Central – Wan Chai Bypass (CWB). However, detailed design of surface transport infrastructure is subject to further study, specifically the impact on harbour-front land use and enjoyment, and reclamation.

In accordance with the request by the Sub-Committee, the Consultants for the Wan Chai Development Phase II (WDII) Review (Consultants) have submitted four papers on Deep Tunnel Option, Inland Alignments for the Trunk Road, Slip Roads 1, 2 and 3 at Wan Chai and Slip Road 8 at Causeway Bay, and "No-reclamation" Alignments for the Trunk Road respectively, for consideration by the Sub-Committee at the meeting of 9 March 2006.

At that meeting, the Sub-Committee members asked for further information on the overall Trunk Road design, including horizontal and vertical alignments and harbour-front enhancement ideas. The Consultants have subsequently prepared a comprehensive report titled "Trunk Road Alignments & Harbour-front Enhancement" to provide the required information. Several ideas, with the Trunk Road and harbour-front enhancement planned holistically, together with their

pros and cons and considerations with respect to the the Protection of the Harbour Ordinance (PHO) are also presented for consideration.

This summary highlights the following major issues addressed in the Consultants report:

1. Need for the Trunk Road
2. Trunk Road Route Assessment
3. No-reclamation Alignments
4. Trunk Road Form of Construction
5. Harbour-front Enhancement
6. Effect of Ground Level Highway Infrastructure.

1 NEED FOR THE TRUNK ROAD

1.1 The Central Business District is currently served by the east-west Connaught Road Central/Harcourt Road/Gloucester Road Corridor (Corridor). This Corridor is primarily a dual four-lane urban trunk road serving as a key east-west link for Hong Kong Island North. As an Urban Trunk Road, it bears the responsibility of carrying the long-haul traffic between east and west of Hong Kong Island. This Corridor is already operating beyond its capacity as can be observed on site. Previous and recent strategic transport studies have predicted further increase in traffic demand along the east-west Corridor, and confirmed the need for a parallel waterfront Trunk Road, the CWB, to avoid more extensive and frequent traffic congestion and even gridlock in the road network.

1.2 Traffic management and fiscal measures are already in place to maximize the capacity of the existing road network and suppress traffic demand. Further measures including electronic road pricing (ERP) have also been considered. All these existing and proposed measures, however, cannot resolve the traffic congestion problem along the east-west corridor. In other words, the CWB is essential, and ERP can complement the CWB but cannot replace it.

1.3 An Expert Panel Forum on Sustainable Transport Planning and Central-Wan Chai Bypass (Expert Panel) comprising leading local and overseas experts in the transport and planning fields has reviewed on the sustainable transport planning for the northern shore of Hong Kong Island including the need for the CWB. In the "Report of the Expert Panel on Sustainable Transport Planning and Central-Wan Chai Bypass", the Expert Panel supports the construction of the CWB, the provision of two sets of planned slip roads at Wan Chai and Causeway Bay, and Road P2.

2 TRUNK ROAD ROUTE ASSESSMENT

2.1 Key Considerations

2.1.1 In assessing the alignment of the Trunk Road through the WDII project area, the following constraints have to be considered:

- At the western end, connecting to the Trunk Road tunnel to be constructed under the Central Reclamation Phase III (CRIII) project is required;
- At the eastern end, the Trunk Road needs to connect to the existing elevated Island Eastern Corridor (IEC) flyover structure;
- Provision of slip road connections near Hong Kong Convention and Exhibition Centre (HKCEC), and at Victoria Park Road, Gloucester Road and Hing Fat Street;
- Avoid affecting the MTR Tsuen Wan Line tunnel structure;
- Avoid affecting the Cross Harbour Tunnel (CHT) or conflicting with the rock anchor at the tunnel approach portal;
- Allowance for the proposed rail infrastructure : Shatin to Central Link (SCL) and North Island Line (NIL) ; and
- Avoid affecting existing services infrastructure such as electricity sub-stations and sewage treatment plants and the basement or piled foundations of existing developments along Wan Chai North, such as the HKCEC Extension, Grand Hyatt Hotel, Wan Chai Towers, Central Plaza, Renaissance Harbour View Hotel, Great Eagle Centre, Harbour Centre, China Resources Building and Sun Hung Kai Centre, etc.

2.2 Trunk Road Route Alignment

2.2.1 Three corridors have been considered when examining possible Trunk Road alignments:

- “Offshore” alignment
- “Inland” alignment
- “Foreshore” alignment

2.2.2 In view of the above-mentioned key constraints, the “offshore” and inland alignments are found not feasible due to conflict with existing development and infrastructure. The most reasonable and practical Trunk Road routing is along the foreshore of Wan Chai and Causeway Bay.

3 NO-RECLAMATION ALIGNMENTS

3.1 As the construction of the Trunk Road needs to comply with the requirements of the PHO, the first consideration in the holistic planning and design of the Trunk Road is the possibility of an option that could avoid reclamation completely (commonly known as "no-reclamation" alignment).

3.2 The Need for Reclamation

3.2.1 In the west, the Trunk Road will extend the tunnel to be constructed within the CRIII area eastward to pass above the existing tunnel structure of the MTR Tsuen Wan Line as passing underneath it is not feasible. At the crossing point, the Trunk Road tunnel structure will be above sea level and hence requires reclamation. The slip roads at Wan Chai North will also require reclamation as they rise above seabed to their portals at ground level.

3.2.2 In the east, the Trunk Road needs to connect to the existing IEC flyover. If the Trunk Road is to be built in the form of tunnel, the transition from tunnel to flyover will require reclamation for the ground level tunnel portal construction.

3.2.3 It is therefore concluded that all schemes for the Trunk Road alignment through the WDII project area will require reclamation.

3.3 Deep Tunnel Option

3.3.1 The idea of constructing the Trunk Road by tunnel boring machine (Deep Tunnel Option) with a view to avoiding or minimizing reclamation has also been explored. It was found that the extent of reclamation required would be more than constructing the Trunk Road tunnel by the cut-and-cover method. Because of the big level difference, Slip Road 8 at Causeway Bay could not be provided, resulting in a functionally inferior Trunk Road. The Consultants suggested that there is no justification to pursue the Deep Tunnel Option.

3.4 Other Public Ideas

3.4.1 Other ideas from members of the public said to be able to avoid reclamation have also been examined. It is found that these ideas are either technically not feasible or in fact would involve at least some reclamation.

3.5 Based on the above, it is therefore concluded that there is no possible "no-reclamation" alignment for the Trunk Road.

4 TRUNK ROAD FORM OF CONSTRUCTION

4.1 Two forms for constructing the Trunk Road, namely the tunnel option and the flyover option, have been examined by the Consultants. The following paragraphs briefly describe and compare these different options and ideas.

4.2 Tunnel Option

4.2.1 For the tunnel option for constructing the Trunk Road, three variations, as described below, together with their corresponding harbour-front enhancement ideas are considered. Figures showing these three variations are at **Figures 1 to 6**. Key features of the three variations are briefly described as follows:

Variation 1

4.2.2 The Trunk Road tunnel to be constructed under CRIII will be extended eastward to pass underneath the existing rock anchors of the CHT portal structure, and continues the tunnel to the east of the Causeway Bay Typhoon Shelter (CBTS) and connects to the northern side of the existing IEC.

Variation 2

4.2.3 The Trunk Road tunnel to be constructed under CRIII will be extended eastward to pass underneath the CHT at a position to the south of that in Variation 1 to avoid the rock anchor zone, and continues the tunnel to the east of the CBTS and connects directly into the IEC by reconstructing a section of the existing IEC. For widening the harbour-front promenade adjoining the CBTS and provision of a wide landscaped deck for extending Victoria Park to the harbour-front, the Victoria Park Road and associated connecting roads would be realigned inland.

Variation 3

4.2.4 Except that the tunnel passes underneath the rock anchors of the CHT portal as in Variation 1, other arrangements will be similar to Variation 2.

4.3 Flyover Option

4.3.1 Under the flyover option, the tunnel to be constructed under CRIII will be extended eastward, and will rise up onto an elevated road structure at the waterfront opposite to the Wan Chai Sports Ground. **Figures 7 and 8** illustrate this option and the corresponding harbour-front enhancement idea.

4.3.2 The PHO requires the Harbour to be protected and preserved as a special public asset and a natural heritage of Hong Kong people. Therefore, when examining options for the Trunk Road, the one that may serve best to protect and preserve the Harbour should be identified. For the flyover option, the land formation by physical reclamation together with the water areas of the Harbour affected by flyover structures should be taken into account.

4.4 Comparison of Options and Variations

4.4.1 Comparison between the tunnel option and the flyover option is tabulated in **Table 1**.

Table.1 Comparison of Tunnel and Flyover Options

	Tunnel Option	**Flyover Option**
Affected area of the Harbour: (a) Land formed (b) Flyover structures over water (c) Affected water area	 15 ha 0.5 ha -	 11.5 ha 3 ha 4 ha
Impact to existing traffic	Some disruption at new tie-in to IEC	• Major disruption at new tie-in to IEC • Major disruption due to reconstruction of Victoria Park Road connections
Other technical concerns (impacts to highways structures, etc)	Localised reconstruction of existing IEC at City Garden for merging with the Trunk Road	Reconstruction of existing IEC from Victoria Park Road to Victoria Centre

		Tunnel Option	Flyover Option
Planning and land use considerations	Along Wan Chai shoreline	Land formed can be used for harbour-front enhancement and pedestrian access to the waterfront	Land formed is partly occupied by the tunnel portal which constrains the extent of area for harbour-front enhancement and pedestrian access to the waterfront
	PCWA basin	PCWA basin can be developed into a vibrant marine recreational facility	Highway bridge piers and the low headroom clearance of the flyover restrict the development of the PCWA basin as a recreational facility
	Northern side of Victoria Park	Victoria Park can be extended to the harbour-front via a landscaped deck over the roads	With the flyover running along the northern side of Victoria Park, the landscaped deck over Victoria Park Road and extension of Victoria Park are impractical
	CBTS	The existing CBTS is preserved as far as possible	Part of the water area and the existing promenade will be occupied by bridge piers
Environmental concerns	Noise & Air	• Air quality concern at tunnel portal • Noise at tie-in to IEC (short 'new road' section of IEC)	Significant air and noise impacts along flyover section in Causeway Bay and reconstructed IEC at North Point ('new road')

		Tunnel Option	Flyover Option
	Water Quality	No major operational impacts due to the scheme	No major operational impacts due to the scheme
	Visual	No significant visual impacts	Significant impacts in Wan Chai and (especially) in Causeway Bay (flyover along part of Wan Chai shoreline and through CBTS)
Time for construction		7 years	6 years
Costs*	Total Construction	HK$20B	HK$11B
	Annual Recurrent	HK$110M	HK$75M

***** *(including WDII works & the section of CWB within the WDII project)*

4.4.2 It is found that the tunnel option would serve better to protect and preserve the Harbour. Several key issues are highlighted as follows:

- the affected area of the Harbour under the flyover option will be more;
- the flyover option will have more visual impact and impact on existing traffic and highway structure; and
- the flyover option will limit the opportunities for harbour-front enhancement and improvement to access to harbour-front.

Nevertheless, construction and annual recurrent costs are both lower for the flyover option.

4.4.3 Comparison between the three Trunk Road Tunnel Variations is tabulated in **Table 2**.

Table 2 Comparison of Trunk Road Tunnel Variations

	Tunnel Variation 1	Tunnel Variation 2	Tunnel Variation 3
Area of permanent reclamation	15 ha	18.5 ha	16.5 ha
Impact to existing traffic	• Some disruption at new tie-in to IEC	• Major disruption due to demolition of IEC and new tie-in to IEC • Major disruption due to reconstruction of Victoria Park Road, Causeway Bay Flyover and Gloucester Road Flyover • Major disruption at CHT approach roads due Trunk Road tunnel construction	• Major disruption due to demolition of IEC and new tie-in to IEC • Major disruption due to reconstruction of Victoria Park Road, Causeway Bay Flyover and Gloucester Road Flyover
Other technical concerns (impacts to highways structures, etc.)	• Localised reconstruction of existing IEC at City Garden for merging with the Trunk Road	• Reverse curves at the CHT area: undesirable for Trunk Road in tunnel • Reconstruction of Victoria Park Road and associated connections and Causeway Bay Flyover and Gloucester Road	• Reconstruction of Victoria Park Road and associated connections and Causeway Bay Flyover and Gloucester Road Flyover • Demolition of existing IEC from Victoria Park Road to

		Tunnel Variation 1	Tunnel Variation 2	Tunnel Variation 3
			Flyover • Demolition of existing IEC from Victoria Park Road to City Garden	City Garden
Impacts to existing development		Existing development not affected	Police Officers' Club needs to be demolished	Existing development not affected
Planning and land use concerns	Along Wan Chai shoreline	Land formed can be used for harbour-front enhancement and pedestrian access to the waterfront	Land formed can be used for harbour-front enhancement and pedestrian access to the waterfront	Land formed can be used for harbour-front enhancement and pedestrian access to the waterfront
	PCWA basin	PCWA basin can be developed into a vibrant marine recreational facility	PCWA basin can be developed into a vibrant marine recreational facility	PCWA basin can be developed into a vibrant marine recreational facility
	Northern side of Victoria Park	Victoria Park can be extended to the harbour-front via a landscaped deck over the ground level roads	Victoria Park is reconstructed with a wide landscaped deck over the ground level roads, to a widened promenade	Victoria Park is reconstructed with a wide landscaped deck over the ground level roads, to a widened promenade
	CBTS	The existing CBTS is preserved as far as possible	Filling in the corners of the CBTS can be used for additional waterfront uses	Filling in the south-east corner of the CBTS can be used for additional waterfront uses

		Tunnel Variation 1	Tunnel Variation 2	Tunnel Variation 3
Environ-mental concerns	Noise & Air	• (Lesser) air quality concern at tunnel portal • Noise at tie-in to IEC (short 'new road' section)	• Air quality concern at tunnel portal • Noise along reconstructed IEC (long 'new road' section)	• Air quality concern at tunnel portal • Noise along reconstructed IEC (long 'new road' section)
	Water Quality	No major operational impacts due to the scheme	No major operational impacts due to the scheme	No major operational impacts due to the scheme
	Visual	No significant visual impacts	No significant visual impacts	No significant visual impacts
Time for construction		7 years	8 years	8 years
Costs*	Total Construction	HK$20B	HK$28B	HK$25B
	Annual Recurrent	HK$110M	HK$125M	HK$123M

** (including WDII works & the section of CWB within the WDII project)*

5 HARBOUR-FRONT ENHANCEMENT

5.1 Of the harbour-front enhancement ideas that have been received from the public, those that are considered reasonable and worthwhile to pursue include:

- making use of the land formation along the Wan Chai shoreline for harbour-front enhancement;
- developing the PCWA basin into a vibrant marine recreational facility;
- extending Victoria Park to the harbour-front;
- preserving the existing CBTS as far as possible, or limited reclamation at the two corners of the CBTS;
- constructing a boardwalk along the North Point shoreline.

5.2 Consolidating the above harbour-front enhancement ideas, Figures 2, 4, 6 and 8 illustrate the consolidated harbour-front enhancement and Trunk Road ideas.

5.3 Practical and reasonable harbour-front enhancement ideas consolidated with the Trunk Road tunnel option is described briefed as follows:

- a cultural district to the west of the HKCEC, for arts and cultural fairs, performance venues, and an expo promenade;
- a green leisure zone along the Wan Chai shoreline, with landscaped recreational area and alfresco dining (outdoor cafes, etc.) to add vibrancy to the waterfront;
- a marine recreational zone at the PCWA basin with public sailing activities, venue for visiting sailing ships and sightseeing opportunities;
- a water recreational and entertainment zone at the CBTS, preserving the existing typhoon shelter, and with a landscaped deck providing an extension of Victoria Park to the waterfront;
- another green leisure zone along the North Point shoreline, with landscaped recreational areas.

5.4 For the flyover option, there will only be a cultural district to the west of the HKCEC and a green leisure zone along the Wan Chai shoreline.

6 EFFECTS OF GROUND LEVEL HIGHWAY INFRASTRUCTURE

6.1 The effects of two sets of slip roads, Road P2 and associated ground level highway infrastructure on harbour-front planning have been examined with reference to the HEC's Harbour Planning Principles. It is concluded that these ground level highway infrastructure will not compromise harbour-front accessibility or planning.

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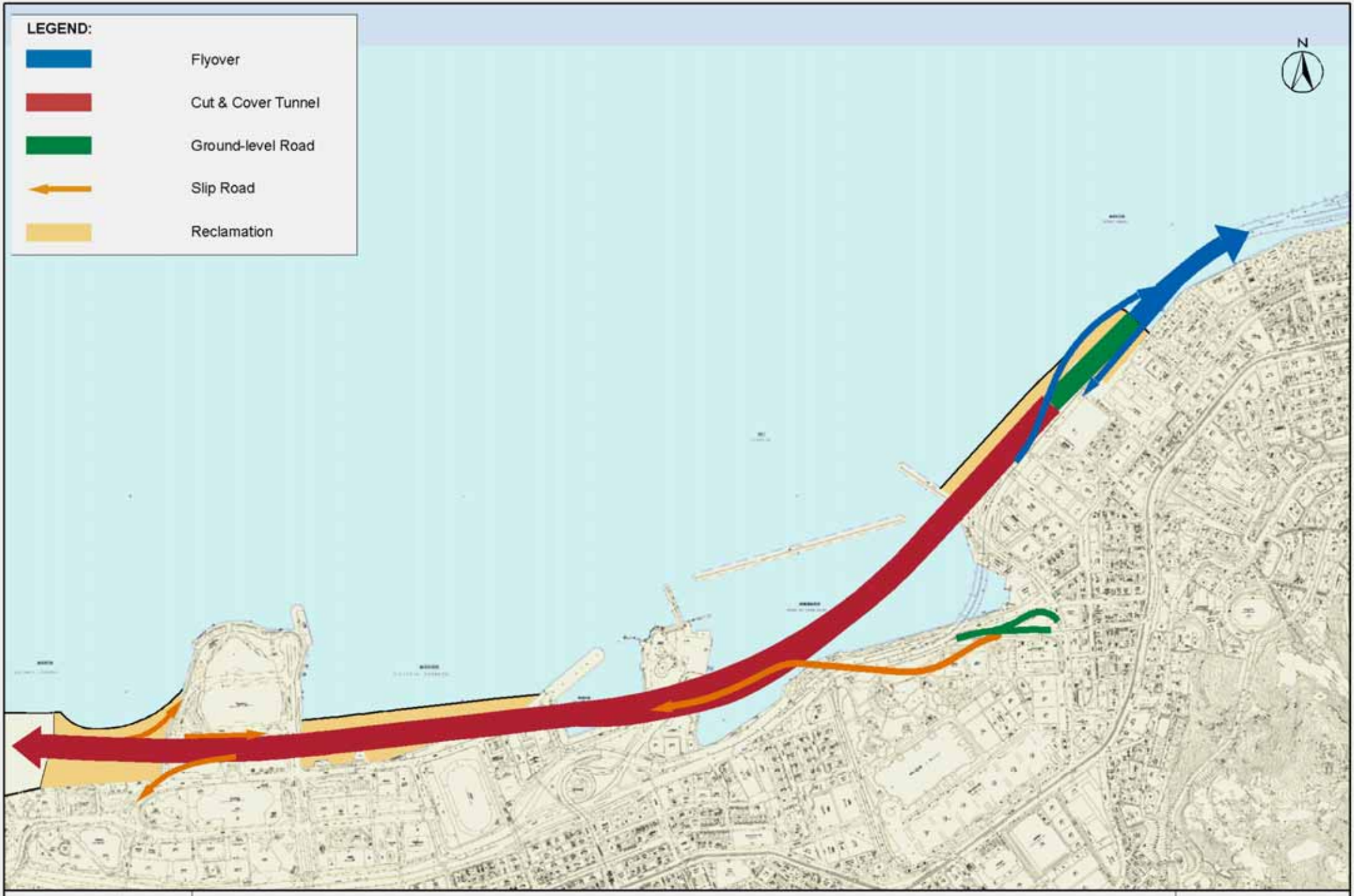

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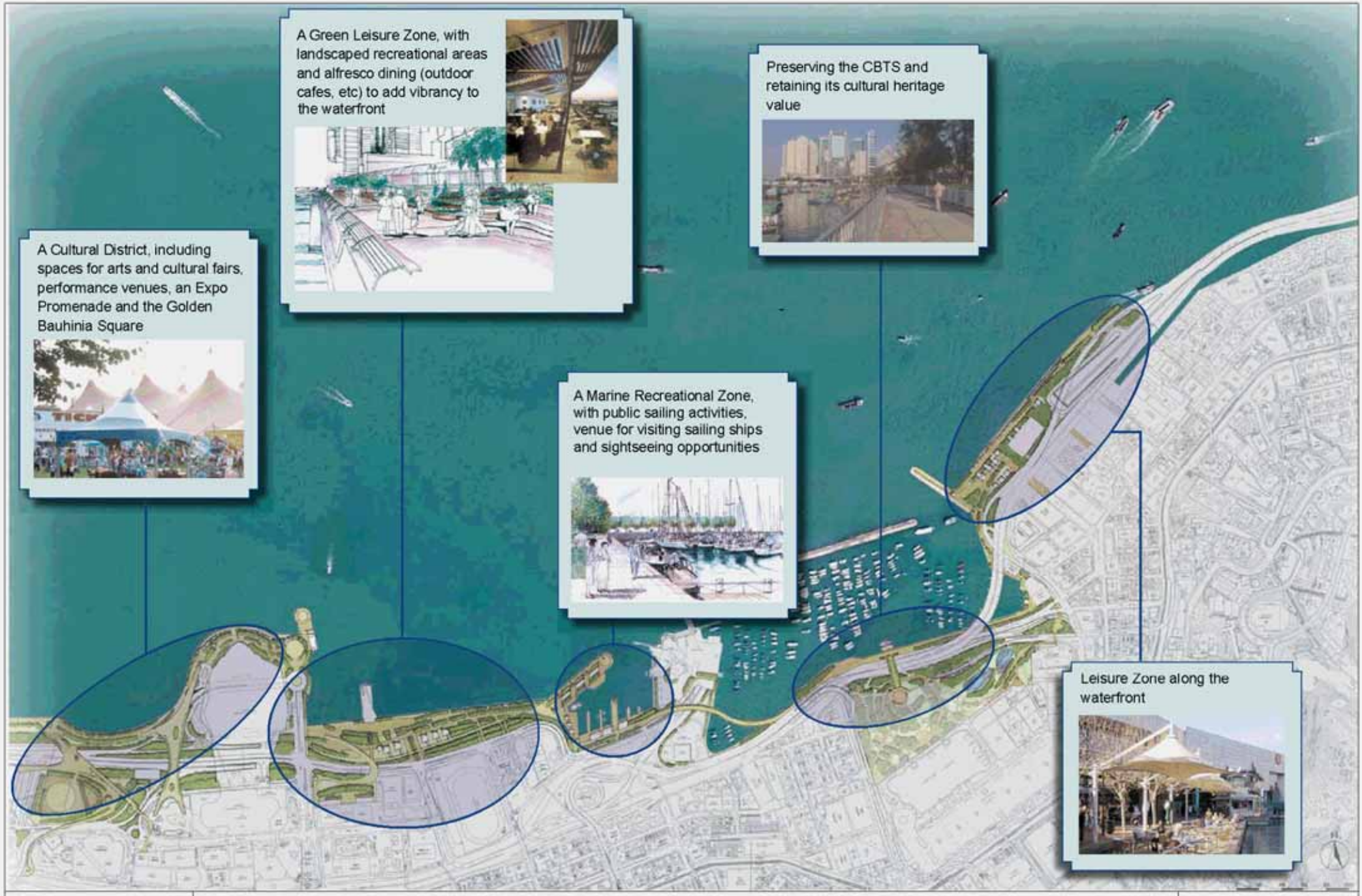
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

TRUNK ROAD TUNNEL VARIATION 1

FIGURE 1



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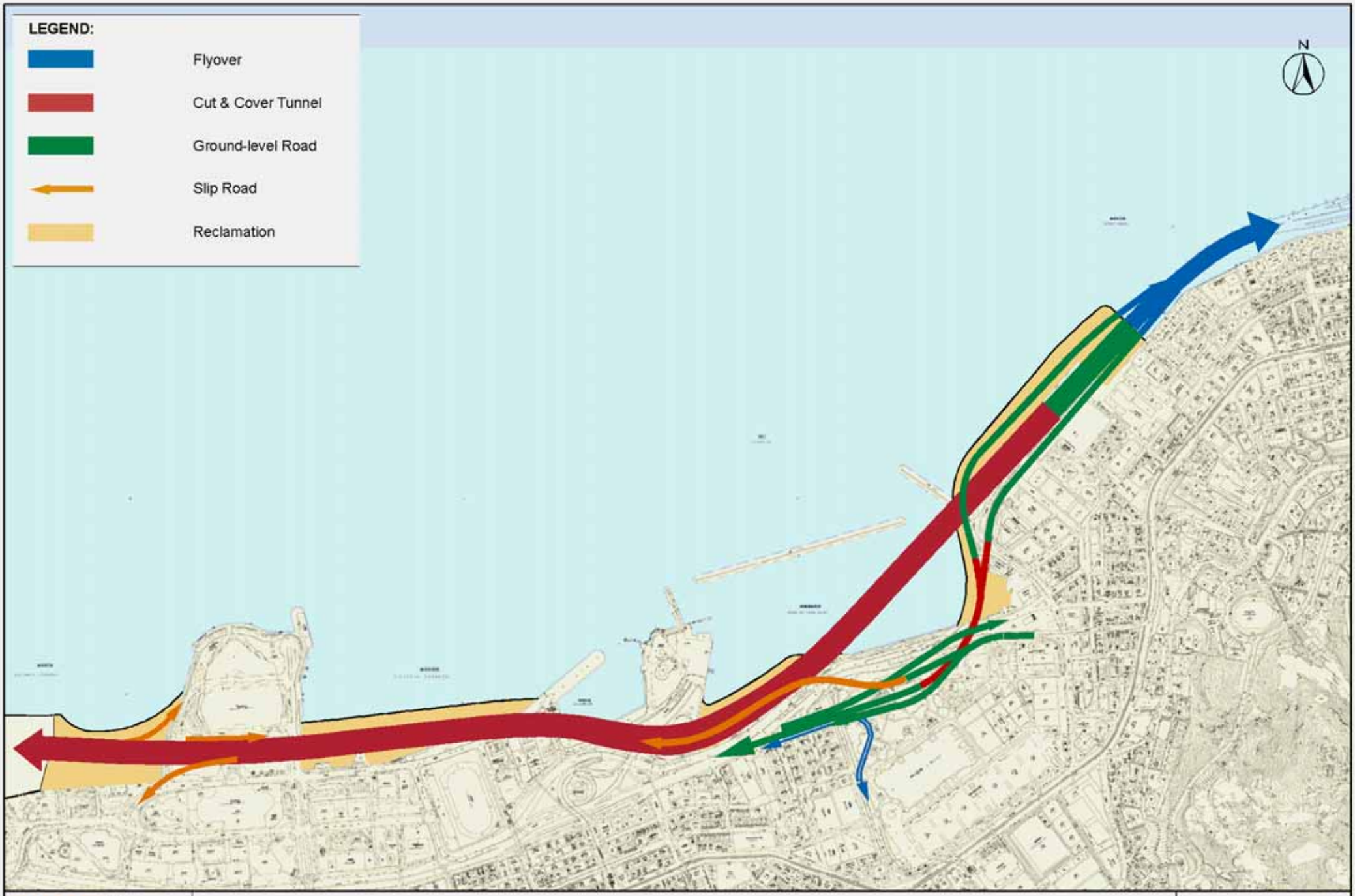
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

CONSOLIDATED HARBOUR - FRONT ENHANCEMENT IDEAS WITH TRUNK ROAD TUNNEL (VARIATION 1)

FIGURE 2



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WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

TRUNK ROAD TUNNEL VARIATION 2

FIGURE 3

A Green Leisure Zone, with landscaped recreational areas and alfresco dining (outdoor cafes, etc) to add vibrancy to the waterfront

A Water Recreational and Entertainment Zone, with fishermen's wharf, floating restaurants, maritime museum and landscape deck extending Victoria Park to the harbour-front

A Cultural District, including spaces for arts and cultural fairs, performance venues, an Expo Promenade and the Golden Bauhinia Square

A Marine Recreational Zone, with public sailing activities, venue for visiting sailing ships and sightseeing opportunities

A Green Leisure Zone, with landscaped recreational areas

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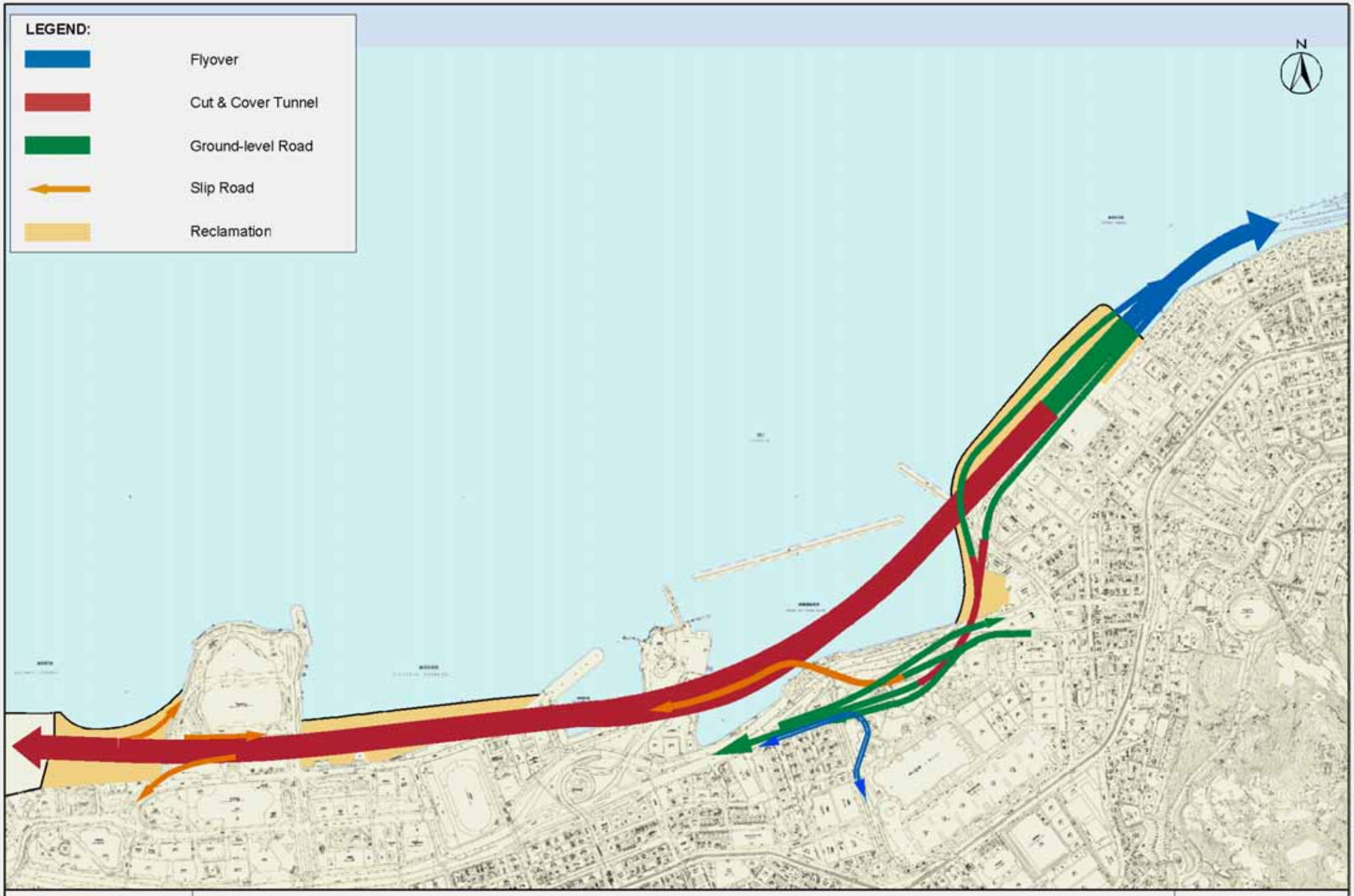
WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

CONSOLIDATED HARBOUR - FRONT ENHANCEMENT IDEAS WITH TRUNK ROAD TUNNEL (VARIATION 2)

FIGURE 4



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WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

TRUNK ROAD TUNNEL VARIATION 3

FIGURE 5

A Green Leisure Zone, with landscaped recreational areas and alfresco dining (outdoor cafes, etc) to add vibrancy to the waterfront

A Water Recreational and Entertainment Zone, with fishermen's wharf, floating restaurants and landscape deck extending Victoria Park to the harbour-front

A Cultural District, including spaces for arts and cultural fairs, performance venues, an Expo Promenade and the Golden Bauhinia Square

A Marine Recreational Zone, with public sailing activities, venue for visiting sailing ships and sightseeing opportunities

A Green Leisure Zone, with landscaped recreational areas

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CONSOLIDATED HARBOUR - FRONT ENHANCEMENT IDEAS WITH TRUNK ROAD TUNNEL (VARIATION 3)

FIGURE 6

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WAN CHAI DEVELOPMENT PHASE II - PLANNING AND ENGINEERING REVIEW

TRUNK ROAD FLYOVER

FIGURE 7

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CONSOLIDATED HARBOUR - FRONT ENHANCEMENT IDEAS WITH TRUNK ROAD FLYOVER

FIGURE 8