

2. GENERAL

2.1 Needs for the Project

2.1.1 The aim of the proposed road improvement works of this Project as described under Section 1.2 is to enhance the existing road network in West Kowloon Reclamation Development (Phase 1) and relieve the traffic congestion noted for some of the road junctions such as to fulfil the future traffic needs due to the development within the area including WKCD, WKT of XRL and building developments above Austin Station and XRL.

The anticipated programme of Phase 1 is to commence in February 2014 and to complete in end 2015. The anticipated programme of Phase 2 is not available as the decision whether Phase 2 will be pursued has not been made at the time of this Report.

The benefits associated with each individual improvement scheme are further elaborated as follows:

Scheme H

2.1.2 This scheme consists of Part (A) and Part (B). Part A comprises the construction of an approximately 6m wide one-lane elevated carriageway connecting the elevated Hoi Po Road northbound to WKH northbound. Part B comprises the provision of an extra traffic lane for the elevated NCR northbound at its junction with elevated Jordan Road via a separated viaduct structure.

2.1.3 *Benefits:* Upon the completion of Scheme H(A), traffic on the elevated NCR to WKH northbound could travel through Hoi Po Road and Scheme H(A) instead of the busy junction of Lin Cheung Road / Jordan Road. Scheme H(B) is to cater for the anticipated increase in traffic along elevated NCR northbound destined for WKH northbound via Scheme H(A). As such, Scheme H(B) compliments Scheme H(A), and combined, they will serve as a convenient and direct route for local traffic from the existing Kowloon Station developments and the future WKCD to access WKH northbound. The corresponding traffic routes with and without Scheme H are shown on **Figure 2.1**.

Scheme I

2.1.4 This scheme comprises the construction of an approximately 6m wide elevated carriageway connecting the elevated NCR northbound with the WHC toll plaza area towards Hong Kong Island.

Benefits: Scheme I would provide a quick and convenient route for local traffic from the current Kowloon Station developments and the future WKCD to access WHC. This avoids travelling via the busy junction of Lin Cheung Road and Jordan Road. The corresponding traffic routes with and without Scheme I are shown on **Figure 2.2**.

Scheme J

2.1.5 This scheme comprises the construction of an approximately 6m wide at-grade slip road connecting the slip road of WKH southbound to NCR.

2.1.6 *Benefits:* Scheme J would provide a convenient and direct route for traffic from WKH southbound via Lin Cheung Road southbound to access elevated NCR and the at-grade Jordan Road. This avoids travelling via the busy junction of Lin Cheung Road

and Jordan Road. The corresponding traffic routes with and without Scheme J are shown on **Figure 2.3**.

Interim Scheme Q & the Improvement Works at Junction of Canton Road/Jordan Road/Ferry Street

2.1.7 The road improvement works under this scheme involve:

- Road junction improvement at junction of Canton Road/Austin Road/Austin Road West
- Road junction improvement at junction of Canton Road/Wui Cheung Road
- Road junction improvement at junction of Canton Road/Austin Road/Ferry Street

2.1.8 ***Benefits:*** After the completion of these road improvement works, traffic conditions at the corresponding road junctions will be improved.

2.1.9 Without the Project, the existing traffic congestion problems in the area at the existing major road corridors including Jordan Road, Ferry Street, Canton Road, Lin Cheung Road, Wui Cheung Road and Austin Road cannot be relieved. Long queues of up to 340m causing blockage to the upstream junctions in the peak hours of Saturdays are observed at present. In addition, the condition will be worsen with the additional traffic arising from the substantial developments and transport infrastructures on the WKRD. With severe traffic congestion, there would have consequential adverse air quality impacts as the vehicles are in idling condition in traffic congestion. The noise environment of the project area would also be increased due to the expected growth of traffic after completion of the development on WKRD.

2.1.10 The Project will relieve the traffic congestion in the WKRD area by providing new traffic lanes linking the existing roads and improving the existing road junctions that have severe traffic congestion during peak hours at present. With benefits from different schemes of the Project as mentioned above in **2.1.3, 2.1.4, 2.1.6** and **2.1.8**, the Project will reduce traffic congestion and therefore reduce deterioration of air quality and noise environment in the vicinity. With less traffic congestion, the project would bring improvements in air quality and noise environment from existing road networks and the overall quality of the ambient environment, especially for the residential premises within and in the vicinity of the WKRD area. In this regard, it is anticipated that the future air and noise environment will be improved in the presence of the project.

2.2 Consideration of Alternative Alignment, Alternative Construction Method and Selection of Preferred Scenario

2.2.1 Traffic study had been carried out separately under different Agreement before this Project. The traffic study concluded that no feasible alternative alignment is available due to various physical constraints. The proposed alignment is in fact fully restrained by the existing road alignments and existing layout of the road structures, as the proposed works have to link up the existing roads and structures.

2.2.2 Schemes H(A), Scheme H(B) & Scheme I will be constructed cast-in-situ. Alternative construction method such as pre-cast construction method has been considered but has been confirmed to be infeasible based on the following reasons: -

- (a) Traffic impact during construction: Delivery of pre-cast segments and lifting the segments into the place would not be practical without occupying the traffic lanes (or even full closure of the carriageway). The traffic impact is considered to be significant. The implementation programme will also be significantly increased as segments should only be erected in series based on pre-cast method.
- (b) Environmental impact during construction: In order to minimise the traffic impacts, delivery and lifting of segments would only be practical to be undertaken during the mid-night. The noise impact during the works would be more severe than based on cast-in-situ method.
- (c) Engineering constraint: Construction of Scheme I (with tight radius of curvature) by pre-cast method would not be practical due to the extensive unbalanced method during the works. Just in case it should be adopted, the foundation of Scheme I should be significantly increased. Not only the traffic impact is more significant due to the increased extent of closure of traffic lanes for greater extent of foundation works (i.e. large number of piles and larger pile cap), the implementation programme will also be significantly increased as phasing of works to reduce the traffic impact is required.
- (d) Economic cost: Geographical locations of Schemes H(A), Scheme H(B) & Scheme I are different, but the length of the individual schemes are only between 200m to 400m, which can hardly be considered as economically viable based on the significant mobilization cost for setting up a pre-casting yard and the launching girder to other kinds of lifting equipment. (Remark: Pre-cast method is commonly adopted for viaducts with over 1km in length.)
- (e) Implementation programme: Based on the constraints in (a) & (c) above, it is estimated that the duration of works will be substantially increased from around 23 months (based on cast-in-situ) method to at least 3 years (based on pre-cast method).

2.2.3 Based on the considerations above, cast-in-situ method is considered to be the preferred construction scheme. Environment benefits of cast-in-situ method include the following:-

- (a) The duration of works is substantially reduced (from 3 years to 23 months) by minimizing the impact on traffic, hence obviating the programme constraint due to working at night only; and by minimising the extent of the foundation works, hence obviating the need of further phasing the foundation works in order to maintain the traffic flow.
- (b) The noise impact during the works is substantially reduced as it is envisaged that night-works is not required.

2.2.4 The foundation types of all the viaducts will be found on pre-bored H-piles. Pre-bored H-piles is adopted as the sites are very congested for all the schemes. For example, only 2 out of 6 existing traffic lanes on WKH southbound will require to be closed for the construction of Scheme H(B) if pre-bored H-pile is adopted. If bored pile is adopted, closure of at least 3 out of 6 existing traffic lanes is required to accommodate the much larger piling plants. Temporary traffic impacts would thus be more significant with the adaptation of bored pile. As all the schemes are located on WKH and in close vicinity to Western Harbour Crossing, minimisation of temporary traffic impact is vital. With reduced traffic impacts (reduced lane closure by adopting pre-

bored H-piles) and less traffic jams, there will be a reduction in air and noise impacts from vehicles.

- 2.2.5 In selecting temporary support structures for excavation, options with less waste impact such as pipe pile wall instead of diaphragm wall will be considered.
- 2.2.6 To maximize the use of public fill/inert C&D materials for construction works, on site sorting will be carried out and the suitable public fill/inert C&D materials will be used in earthwork as backfilling materials.
- 2.2.7 The proposed works involve providing new traffic lanes to link up the existing roads and structures. Therefore, similar structural configurations and built-forms to the existing roads and structures will be adopted to blend in with the existing roads and structures, so as to reduce the visual impacts. Landscape works will be proposed as far as possible in areas under the proposed elevated roads with climbers on concrete piers to reduce the landscape impacts.

2.3 Concurrent Projects

- 2.3.1 Other projects which are anticipated to be implemented at around the same period when the construction of this Project is scheduled to take place from February 2014 to end 2015 are indicated below in **Table 2.1**.

Table 2.1 Concurrent Projects Anticipated During Construction Phase

Name of Project	Project Proponent	Anticipated Programme
Express Rail Link	MTRCL + HyD	Dec 2009 – Jun 2015
West Kowloon Cultural Development	WKDA	2013 – beyond 2020
Road Works at West Kowloon	MTRC	2011 – 2014
Construction of Dry Weather Flow Interceptor at Cherry Street Box Culvert and Other Works	DSD	2014 – 2018
Trenchless Cable Duct Crossings at Nga Cheung Road	CLP	2013 - 2015
Central Kowloon Route & Widening of Gascoigne Road Flyover	HyD	2015 – 2020

The effects of these projects when taken together with this Project will be reviewed to determine the cumulative environmental impact to the sensitive receivers.

2.4 Designated Project

- 2.4.1 As defined in EIAO Schedule 2 Part 1A, “a road which is an expressway, trunk road, primary distributor road or district distributor road including new roads, and major extensions or improvements to existing roads” shall considered as a designated project. As Schemes H, I, and J as described in **Section 1.2.1** involve the construction of new roads, these schemes constitute A.1 designated project. However, due to insignificant noise impact, Interim Scheme Q & the Improvement Works at Junction of Canton Road/Jordan Road/Ferry Street is not considered as a designated project. The details are described in **Chapter 4**. Nonetheless, the assessment for Interim Scheme Q and

Improvement Works at Junction of Canton Road / Jordan Road / Ferry Street is included in the report.

2.5 EIA Study Brief

2.5.1 In accordance with the requirements of Section 5(1)(a) of the EIAO, an application (No.ESB-236/2011) for an EIA study brief was submitted to Environmental Protection Department (EPD) on 15 August 2011 with a Project Profile (No. PP-450/2011). The Brief identified that the Project is a designated project. Pursuant to Section 5(7)(a) of the EIAO, the Director of Environmental Protection issued to the Project Proponent, namely Highways Department (HyD), to carry out an EIA study.

2.6 Objectives of the EIA Study

2.6.1 The key objectives of the EIA Study are to identify key environmental issues and constraints of the major elements of the road/junction improvement schemes and to consider possible environmental impact of the schemes and appropriate measures. The detailed objectives are listed as follows:-

- (i) To describe the Project together with the requirements and environmental benefits for carrying out the Project;
- (ii) To identify and describe elements of community and environment likely to be affected by the Project and/or likely to cause adverse impact to the Project, including both the natural and man-made environment and the associated environmental constraints;
- (iii) To provide information on the consideration of alternatives design/options to avoid and minimize potential environmental impact to sensitive uses;
- (iv) To identify and quantify emission sources (including air quality, noise, water quality and waste); and determine the significance of impact on sensitive receivers and potential affected uses;
- (v) To identify and systematically evaluate any potential landscape and visual impact and to propose measures to mitigate this impact;
- (vi) To propose provision of mitigation measures to minimize pollution, environmental disturbance and nuisance during construction and operation of the Project;
- (vii) To investigate the feasibility, practicability, effectiveness and implications of the proposed mitigation measures;
- (viii) To identify, predict and evaluate the residual environmental impact (i.e. after practicable mitigation) due to the Project and the cumulative effects expected to arise during construction and operation of the Project in relation to the sensitive receivers and potentially affected uses;
- (ix) To identify, assess and specify methods, measures and standards to be included in the detailed design, construction and operation of the Project which are necessary to mitigate these environmental impact and cumulative effects and reduce them to acceptable levels;
- (x) To investigate the extent of the secondary environmental impact that may arise from the proposed mitigation measures and to identify constraints

associated with the mitigation measures recommended in the EIA study, as well as the provision of any necessary modification; and

- (xi) To design and specify environmental monitoring and audit requirements to ensure the effective implementation of the recommended environmental protection and pollution control measures.

2.7 Structure of EIA Report

2.7.1 The EIA report presents the environmental impact that may arise from the road improvement works and the associated mitigation measures, as follows:-

Section 1 (Introduction) – Introduces the background information and the layout of the EIA Report;

Section 2 (General) – Project Description;

Section 3 (Air Quality Impact) – Presents the legislation, methodology, assessment and recommendations for air quality impact;

Section 4 (Noise Impact) – Presents the legislation, methodology, assessment and recommendations for noise impact;

Section 5 (Water Quality Impact) – Presents the legislation, methodology, assessment and recommendations for water quality impact;

Section 6 (Waste Management) –Presents the legislation, methodology, assessment and recommendations for waste management;

Section 7 (Landscape and Visual Impact) – Presents the legislation, methodology, assessment and recommendations for landscape and visual impact;

Section 8 (Summary of Environmental Outcomes) – Presents the key environmental outcomes;

Section 9 (EM&A Requirements) – Presents the EM&A requirements; and

Section 10 (Conclusion) – Summarizes the findings.

2.7.2 Impacts on ecology, historic and cultural heritage, and on agriculture and fisheries activities are not of concern to this Project.