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ACE-EIA Paper 8/2022
For advice on 17 October 2022

Environmental Impact Assessment Ordinance (Cap. 499)
Environmental Impact Assessment Report

Improvement of Lion Rock Tunnel

PURPOSE

This paper presents the key findings and recommendations of the Environmental Impact Assessment (EIA) report on “Improvement of Lion Rock Tunnel” (hereafter known as “the Project”) submitted under Section 6(2) of the Environmental Impact Assessment Ordinance (EIAO) (Application No. EIA-285/2022). The Highways Department (HyD) (“the Applicant”) and its consultants will present the report at the meeting of the EIA Subcommittee.

ADVICE SOUGHT

2. Members’ views are sought on the findings and recommendations of the EIA report. The Director of Environmental Protection (DEP) will take into account the comments from the public and the Advisory Council on the Environment (ACE) in deciding whether or not to approve the EIA report under Section 8(3) of the EIAO.

BACKGROUND

3. The existing Lion Rock Tunnel (LRT), with two 2-lane tunnel tubes, is a major trunk road linking traffic between Sha Tin and Kowloon. It has been put in use for over 40 years. With the increase of traffic flow over the years, the LRT and its connecting roads are already operating close to their capacity. The Project is to rehabilitate and improve the existing tunnel tubes of the LRT and to take this

opportunity to enhance the capacity of the tunnel and the connecting roads as far as possible.

4. The Applicant submitted the EIA report for the Project for approval under the EIAO on 30 June 2022. The DEP, in consultation with relevant authorities, considered that the EIA report has met the requirements in the EIA Study Brief and the Technical Memorandum on EIA Process (TM), for the purpose of its exhibition for public inspection under Section 7(4) of the EIAO on 5 August 2022.

NEED FOR THE PROJECT

5. Being in service for more than 40 years, the existing LRT does not meet the current standards in various aspects including road safety, minimum dimensions and waterproofing, etc. Comprehensive rehabilitation of the two existing tunnel tubes is needed to bring the LRT up to current standards and extend its serviceable life. Temporary closure of one of the existing tunnel tubes for rehabilitation works would not be feasible in view of the heavily trafficked situation and hence a new tunnel tube is necessary. Besides, there is serious traffic congestion at the LRT during peak hours and road improvements along the connecting roads on both Sha Tin and Kowloon sides are thus needed to alleviate the problem.

ENVIRONMENTAL BENEFITS

6. According to the EIA report, the Project will bring about the following potential environmental benefits:

- (i) **Reduce road traffic noise and vehicular emission as a result of traffic improvement:** The Project would provide additional traffic capacity to the LRT and its connecting roads and thus smoothen traffic flows and alleviate traffic congestion contributing to reduction of road traffic noise and vehicular emission; and
- (ii) **Alleviate existing road traffic noise impact:** Noise mitigation measures (e.g. noise barriers and noise enclosures) will be implemented along the LRT Road on Sha Tin side. More than 1,500 existing dwellings, some of which are exposed to excessive traffic noise, along the LRT Road on Sha Tin side will benefit from the noise mitigation measures of the Project.

DESCRIPTION OF THE PROJECT

7. The Project can be broadly divided into two parts, namely works at the LRT and its supporting facilities; and road improvement works. The layout plan of the Project is shown in **Figure 1**. Construction of the Project is tentatively scheduled to commence in the 1st Quarter of 2025, for completion in the 4th Quarter of 2034.

8. The key components of the Project are as follows:

- (i) Construction of a new 3-lane road tunnel of approximately 1.4 km long in between the two existing tunnel tubes, enlargement of the existing Kowloon bound tunnel tube from 2 lanes to 3 lanes, and refurbishment of the existing Sha Tin bound tunnel tube;
- (ii) Re-provision of the tunnel supporting facilities including the administration building, ventilation buildings and car depot, etc., and construction of a vehicular crossover bridge and a footbridge at the toll plaza;
- (iii) Widening of the existing LRT Road on both Kowloon and Sha Tin sides, construction of a new single lane trunk road crossing over Lung Cheung Road and widening / re-alignment of associated slip roads / connecting roads; and
- (iv) Ancillary works including provision of noise barriers / enclosures, slope works, water mains diversions, landscape works, etc.

9. The Project is a designated project under Items A.1, A.7 and Q.1, Part I, Schedule 2 of the EIAO, as extracted below for ease of reference:

- (i) Item A.1 – “A new trunk road and major extensions or improvements to existing trunk road and primary distributor”;
- (ii) Item A.7 – “A road tunnel more than 800 m in length between portals”; and
- (iii) Item Q.1 – “All projects including new access roads, sewage treatment facilities, earthworks and other building works partly or wholly in an existing country park.”

CONSIDERATION OF ALTERNATIVE OPTIONS

10. The EIA report has considered different development options for the Project. Key considerations include tunnel alignment, road alignment, design and location of tunnel supporting facilities, tunnelling method and sequence of works to avoid and minimise environmental impacts. The recommended options have taken into account site and traffic constraints, environmental impacts in terms of ecology, air quality, noise, waste management, visual, landscape and hazard to life aspects. The key approaches that have been adopted by the Applicant to avoid or minimise environmental impacts are summarised below:

(i) Avoidance of Impacts

- (a) Constructing the new tunnel tube in between the existing LRT tubes (“Middle Option”) to avoid loss of important habitat and landscape resources within Lion Rock Country Park (LRCP). The Middle Option of new tunnel tube is also the shortest in length that could minimise generation of construction and demolition materials due to tunnel construction;
- (b) Using Tunnel Boring Machine (TBM) instead of blasting for tunnel construction to avoid hazard to life arising from the use / storage of explosives and traffic disruption during the blasting operation;
- (c) Locating the tunnel supporting facilities outside the woodland of LRCP to avoid loss of habitat with high ecological value; and
- (d) Locating the stockpiling area within the footprint of permanent works to avoid additional habitat loss.

(ii) Minimisation of Impacts

- (a) Adopting a “downhill” option for widening of LRT Road on the Sha Tin side instead of “uphill” option (i.e. closer to LRCP) to minimise encroachment on LRCP and woodland areas; and
- (b) Scheduling the construction works by phases to minimise (i) the cumulative environmental impacts in construction phase; and (ii) vehicular emission and road traffic noise due to traffic disruption.

SPECIFIC ENVIRONMENTAL ASPECTS TO HIGHLIGHT

Ecology

11. A 6-month ecological survey was carried out from February to July 2020, covering both wet and dry seasons to identify the habitat and species of conservation importance within the 500-m assessment area of the Project. Due to design changes to the Project, an additional survey of 7 months was carried out between May 2020 and January 2022 to cover additional Project footprint.

12. Different development options (e.g. tunnel alignment, road alignment, and location of tunnel supporting facilities, etc.) have been considered to avoid and minimise direct impact to recognised sites of conservation importance (i.e. the Beacon Hill Site of Specific Scientific Interest (SSSI) and LRCP) and habitats with high ecological values (i.e. contiguous woodland and natural watercourse). The majority of the construction works (> 90%) would be carried out within urbanised developed areas and roadside plantation with low ecological values.

13. A total of 0.24 ha woodland (0.16 ha within the fringe of LRCP) would be permanently lost, mainly due to the road widening works near Hung Mui Kuk Barbecue Area as a result of site constraints, which would be compensated by off-site woodland compensation at a ratio of not less than 1:1 in terms of area near the Project boundary. The temporarily affected vegetated areas (1.48 ha) including woodlands, mixed woodlands, plantation and shrubland would be reinstated in-situ after the completion of the construction works.

14. No fauna species of conservation importance were identified within the Project footprint. Flora species of conservation importance identified within the Project footprint and commonly found in the territory including *Ailanthus fordii* (常綠臭椿), *Aquilaria sinensis* (土沉香), *Canthium dicocum* (魚骨木), *Gnetum luofuense* (羅浮買麻藤), *Pavetta hongkongensis* (香港大沙葉) and *Rhodoleia championii* (紅花荷) would be preserved in-situ as far as practicable. If in-situ preservation is found not viable due to site constraints or plant conditions (e.g. poor health, form, and structure), appropriate mitigation measures such as transplantation and / or compensation will be implemented.

15. Appropriate groundwater control measures (e.g. grouting and installation of waterproof lining) would be implemented to minimise groundwater infiltration during tunnel construction. Surface water level monitoring would be conducted at

the natural watercourses in the vicinity of tunnelling works area, including those within Beacon Hill SSSI and LRCP, to ensure that the hydrological conditions in the nearby areas would not be affected by the Project.

Noise

16. The EIA Study has assessed the road traffic noise impact during the operation phase of the Project based on the predicted worst case traffic flows in 2041. It is estimated that more than 2,300 existing residential dwellings, classrooms and other noise sensitive receivers (NSRs) are currently subject to excessive road traffic noise impact. With the proposed direct noise mitigation measures including approximately 1.5 km long semi-enclosures, cantilever barriers and vertical barriers, it is estimated that more than 1,200 existing NSRs will be protected (i.e. predicted overall noise level reduced from exceedance to compliance with the respective noise criteria); while more than 1,500 existing NSRs would be benefited (i.e. reduction of at least 1.0 dB(A) predicted overall noise level).

Landscape and Visual

17. Approximately 5,000 nos. of tree were surveyed within the Project boundary. The majority of the trees were found on the slopes along LRT Road and none of them are Old and Valuable Trees (OVT). About 2,100 nos. of trees within the Project boundary will be retained and about 2,900 nos. of trees will be felled. Since the survival rate of mature trees on natural / engineered slope after transplanting is low and due to site constraints, those unavoidably felled trees would be compensated with a ratio of not less than 1:1 according to Development Bureau Technical Circular (Works) No. 4/2020 along the roadside and on the slope within project boundary or other off-site areas.

18. Appropriate landscape and visual mitigation measures were also proposed which include control of night-time lighting glare, erection of decorative screen hoarding, aesthetically pleasing design of the permanent structures, footbridges, noise barrier and enclosures.

19. With the above mitigation measures, the residual landscape and visual impacts of the Project are considered acceptable during the construction and operation phases.

Other Environmental Impacts

20. Other environmental impacts including construction noise, air quality, water quality, waste management, land contamination, cultural heritage and hazard to life have been satisfactorily addressed in the EIA report. With the implementation of the recommended mitigation measures, the Project will comply with the relevant requirements under the TM.

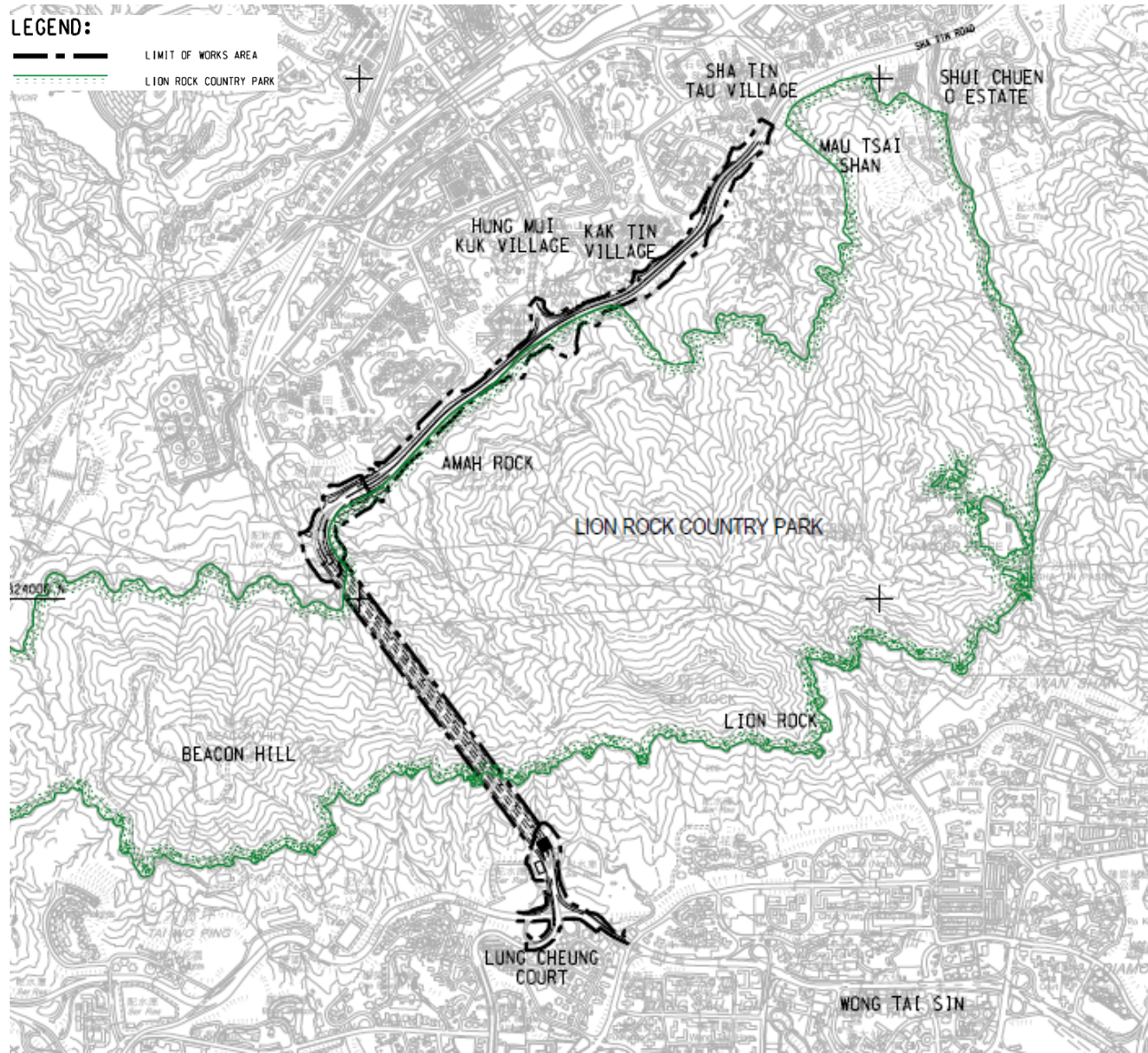
ENVIRONMENTAL MONITORING AND AUDIT


21. The EIA report has included an Environmental Monitoring and Audit (EM&A) Manual, which recommends an EM&A programme during the construction and operation phases of the Project. Key recommended EM&A requirements cover ecology, air quality, noise, water quality, landscape and visual and cultural heritage aspects.

PUBLIC CONSULTATION

22. The Applicant has made the EIA report, EM&A Manual and Executive Summary available for public inspection under the EIAO from 15 August to 13 September 2022. During the inspection period, a total of 61 sets of public comments were received by the Environmental Protection Department (EPD). A summary of all public comments received by EPD during the public inspection period and a gist of the main concerns raised in the public comments will be provided separately.

September 2022
Environmental Assessment Division
Environmental Protection Department



Project Title:	Improvement of Lion Rock Tunnel	EIA Application No.:	
Figure 1	Project Layout Plan [Remarks: This figure is prepared based on Figure 2.1 of the EIA Executive Summary]	EIA - 285/2022	