

TD 181/2008

# Study on Pedestrian Subways and Related Traffic Improvement Measures in Causeway Bay



## Executive Summary

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AECOM Asia Co. Ltd.

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## 1 INTRODUCTION

### 1.1 Background

- 1.1.1 Causeway Bay is a popular shopping/entertainment area in Hong Kong. Despite heavy local and through traffic, it is always crowded with shoppers and tourists. The footpaths at ground level are barely adequate to serve the high volume of pedestrian flow, and heavy pedestrian movements at signal-controlled crossings seriously affect the throughput of the major roads. To avoid the situation worsening, it is considered necessary to reduce the pedestrian flow at ground level footpaths and minimize the vehicle-pedestrian conflicts, thereby improving the walking environment and enhancing road safety.
- 1.1.2 To improve the pedestrian environment in busy business districts and shopping and leisure areas with heavy pedestrian flow is one of the initiatives set out in the 2008-09 and 2009-10 Policy Addresses. In the light of this, consideration has been given to, inter alia, constructing additional pedestrian subways in Causeway Bay linking the Mass Transit Railway (MTR) station with Victoria Park as well as the busy streets in the heart of Causeway Bay and its junction with Happy Valley.
- 1.1.3 AECOM Asia Co. Ltd. was commissioned by Transport Department (TD) in March 2009 to undertake “**TD 181/2008 Study on Pedestrian Subways and Related Traffic Improvement Measures in Causeway Bay**” (the Study) which aims at looking for ways to improve the pedestrian environment and road safety by providing a grade-separated pedestrian network together with traffic improvement measures and streetscape enhancement measures in Causeway Bay.

### 1.2 The Study

- 1.2.1 The Study mainly focuses on the aforesaid pedestrian subway connecting the existing subway system near Happy Valley to Victoria Park via the Causeway Bay MTR Station. It also includes a local pedestrian link across Leighton Road connecting to the future Redevelopment of Caroline Hill Road Site (RCHRS)<sup>1</sup> and some associated traffic improvement and streetscape enhancement schemes<sup>2</sup>.
- 1.2.2 The main objectives of the Study are to:
- review the traffic and transport conditions for the proposed pedestrian subway to improve the pedestrian environment and the connectivity of the central Causeway Bay area;
  - conduct viability study for the construction of the proposed pedestrian subway taking into account the site constraints identified; and
  - carry out schematic design of the recommended pedestrian subway alignments.
- 1.2.3 This Executive Summary summarizes the major findings and recommendations under the Study for ready reference.

## 2 TRAFFIC AND TRANSPORT REVIEW IN THE STUDY AREA

### 2.1 Existing Road and Pedestrian Network

- 2.1.1 The Study Area is shown in **Drawing No. 2.1**.

<sup>1</sup> As the planning parameters of the RCHRS have not yet been confirmed during the course of this Study, the proposed pedestrian link will be subject to review and consultation in due course.

<sup>2</sup> Given that the traffic condition at the concerned areas may vary from time to time and there may be other traffic management schemes being considered, the proposed preliminary schemes will be subject to review and consultation before implementation to ensure their effectiveness and public acceptance.

- 2.1.2 Hennessy Road and Yee Wo Street are one of the major east-west district distributors running through central Causeway Bay area. It is a major public transport corridor operating with franchised buses, mini-buses and tram services. Geographically, Hennessy Road/Yee Wo Street is a physical barrier between major developments in Causeway Bay, such as Sogo in the north and the Lee Gardens in the south, where heavy pedestrian traffic comes across. In parallel with the above roads, Leighton Road is another east-west district distributor running through Causeway Bay.
- 2.1.3 Percival Street at the south of Jaffe Road is a one-way southbound district distributor of three-lane configuration. It is a major transport corridor linking the northern and southern parts of central Causeway Bay area, operated with bus lane and tram tracks. Geographically, Percival Street is an east-west barrier between major developments, such as Times Square in the west and MTR exit at Jardine's Crescent in the east, where heavy pedestrian traffic comes across.
- 2.1.4 Apart from the several strategic transport corridors linking with the Causeway Bay and the adjacent areas, there are also many local streets such as Great George Street, Paterson Street and East Point Road at the northern part of the Study Area, and Yun Ping Road, Hysan Avenue, Matheson Street and Russell Street at the southern part. These local roads provide on-street loading / unloading and pick-up / drop-off facilities as well as mini-bus / taxi stands serving the nearby shops, residential buildings and commercial / retail developments.
- 2.1.5 The pedestrian network at Causeway Bay comprises at-grade footpaths and pedestrian crossings which provide a convenient and direct at-grade walkway system for pedestrian movements. There are also grade-separated pedestrian facilities in the Study Area, including the subways associated with Causeway Bay MTR Station and the several footbridges, providing a safer means for pedestrian movements with better walking environment. In addition, TD has implemented different pedestrian schemes, such as full-time / part-time pedestrianised streets and traffic calming streets, to improve the pedestrian environment and to enhance safety for pedestrians.

## **2.2 Existing Pedestrian Traffic Condition**

- 2.2.1 The survey results indicated that the pedestrian condition at normal weekday on Friday is generally more critical than other days of the week as well as weekend whilst the Friday PM period is the most critical. It further revealed that Kai Chiu Road and the adjacent footway sections connecting the two shopping clusters at the northern side of Hennessy Road near Sogo and at Russell Street near Times Square (referred to as 'Kai Chiu Road corridor' below) are the major pedestrian routings with the peak flow of about 18,000 pedestrian/hour (ped/hr).
- 2.2.2 There are special events held in Victoria Park and Happy Valley Racecourse during the year. For the pedestrian condition, the dispersal phase is often more critical than the arrival phase. At Victoria Park, during a past event, the pedestrian flow at Great George Street became higher than that of normal days and was about the same as that on the most critical walkway section at the Kai Chiu Road corridor, with the peak pedestrian flow of some 15,000 ped/hr. At Happy Valley, on horseracing days, the pedestrian flow along the Kai Chiu Road corridor was not so busy as that of normal days, with the peak pedestrian flow of only about 12,000 ped/hr.

## **2.3 Future Pedestrian Traffic Condition**

- 2.3.1 In the forecast of 2026, the major pedestrian routings at normal days are also identified to be along Kai Chiu Road corridor, with peak pedestrian flow of about 20,000 ped/hr at Jardine's Crescent next to the MTR entrance/exit.

- 2.3.2 The future pedestrian conditions at the dispersal phase for the events at Victoria Park and Happy Valley are also modelled. For the event at Victoria Park, the peak pedestrian demands are found to be the highest at Great George Street and the Kai Chiu Road corridor, with about 17,000 ped/hr. However, horseracing at Happy Valley is less critical as most of the events are held in the evening hours. The highest pedestrian flow is still at Kai Chiu Road corridor, with some 13,000 ped/hr travelling to MTR station.

## 2.4 Improvement Opportunities

- 2.4.1 Key pedestrian issues have been identified in Causeway Bay which generally involve unpleasant walking environment arising from the substantial pedestrian demands to/from the activity nodes, e.g. the shopping clusters near Sogo and Times Square, narrow and congested walkways such as the Jardine's Crescent, heavy on-street loading / unloading and pick-up/drop-off activities, as well as those on-street public transport facilities affecting the effective use of road space, e.g. along Hennessy Road. Road safety is also one of the prime concerns.
- 2.4.2 Based on the identified key issues, improvement opportunities have been developed focusing on improving the overall pedestrian environment in Causeway Bay. The provision of grade-separated pedestrian facility such as pedestrian subway or footbridge may alleviate the at-grade congested condition, as the comfortable walking environment with appropriate landing points will attract some at-grade shoppers and those through pedestrian commuters to use the grade-separated facility. In this regard, the pedestrian subway as identified should be further explored.

## 3 VIABILITY STUDY AND SCHEMATIC DESIGN FOR PEDESTRIAN SUBWAY

### 3.1 Preliminary Alignment(s) and Proposed Layout

- 3.1.1 TD first introduced this Study to the two concerned Area Committees (ACs) in Wan Chai in May 2009 and then held a briefing on the preliminary findings for the Wan Chai District Council (WCDC) and its Development, Planning and Transport Committee (DPTC) as well as the two ACs in August 2009 to seek their initial feedback. In addition, TD also arranged meetings with the Mass Transit Railway Corporation Limited and the developers / owners of some large shopping malls and major buildings in the area to discuss possible connections of their developments to the proposed subway system.
- 3.1.2 After gauging local views and considering the pedestrian flows and various engineering parameters, this Study proposed a preliminary alignment for the pedestrian subway, which would run from Victoria Park, via Great George Street, with connection to the Causeway Bay MTR Station, through Yee Wo Street and Jardine's Crescent, then to Kai Chiu Road; and from the junction of Kai Chiu Road and Lee Garden Road to the vicinity of Happy Valley, four options of subway alignment were proposed, namely Options A, B, C and D as shown in **Drawing No. 3.1** and **Table 3.1**,

**Table 3.1 Alignment Options**

Option	Alignment
Option A	Percival Street → Leighton Road
Option B	Matheson Street
Option C	Lee Garden Road → Hysan Avenue → Leighton Road
Option D	Russell Street → Canal Road East → subway at Sports Road

Table 3.2 Options Review for Subway Alignment

Consideration	Alignment Option			
	Option A (via Percival Street)	Option B (via Matheson Street)	Option C (via Lee Garden Road)	Option D (via Canal Road East)
<b>Existing at-grade pedestrian flow (Friday peak)</b>	About 3,000 ped/hr	About 5,000 ped/hr	About 1,000 ped/hr	About 600 ped/hr
<b>Attractiveness</b>	<u>Less attractive</u> <ul style="list-style-type: none"> <li>Not directly attract pedestrian to/from Russell Street</li> <li>Longer route to Happy Valley</li> <li>Medium pedestrian flow</li> </ul>	<u>Attractive</u> <ul style="list-style-type: none"> <li>Directly attract pedestrian to/from Russell Street</li> <li>Shorter route to Happy Valley</li> <li>High pedestrian flow</li> </ul>	<u>Not attractive</u> <ul style="list-style-type: none"> <li>Not directly attract pedestrian to/from Russell Street</li> <li>Longer route to Happy Valley</li> <li>Low pedestrian flow</li> </ul>	<u>Less attractive</u> <ul style="list-style-type: none"> <li>Directly attract pedestrian to/from Russell Street</li> <li>Shorter route to Happy Valley</li> <li>Low pedestrian flow</li> </ul>
<b>Traffic Impact</b>	<u>More significant traffic impact during construction</u> <ul style="list-style-type: none"> <li>Occupation of traffic lane(s) for both cut-and-cover method and trenchless method</li> <li>Impacts on the key public transport corridors, such as Percival Street and Leighton Road</li> </ul>	<u>Less significant traffic impact during construction</u> <ul style="list-style-type: none"> <li>Occupation of traffic lane(s) and footpath(s) for trenchless method</li> <li>Impacts on taxi stand at Russell Street and junction of Matheson Street and Percival Street</li> </ul>	<u>Significant traffic impact during construction</u> <ul style="list-style-type: none"> <li>Occupation of traffic lane(s) for both cut-and-cover method and trenchless method</li> <li>Impacts on green minibus (GMB) services, loading / unloading activities, Leighton Road and junction of Leighton Road/Percival Street</li> </ul>	<u>Significant traffic impact during construction</u> <ul style="list-style-type: none"> <li>Occupation of traffic lane(s) for both cut-and-cover method and trenchless method</li> <li>Impacts on loading / unloading areas at Russell Street, taxi stand, Canal Road East and junction of Leighton Road/Canal Road East</li> </ul>
<b>Construction / Engineering Constraint</b>	<ul style="list-style-type: none"> <li>Tram-track</li> </ul>	<ul style="list-style-type: none"> <li>Adjacent buildings and foundations</li> </ul>	<ul style="list-style-type: none"> <li>Adjacent buildings and foundations</li> <li>Tram-track</li> </ul>	<ul style="list-style-type: none"> <li>Structures of Canal Road Flyover</li> <li>Underground utilities / decked nullah</li> </ul>
<b>Public Nuisance</b>	<ul style="list-style-type: none"> <li>Local shops</li> <li>Tram Service</li> </ul>	<ul style="list-style-type: none"> <li>Local shops</li> </ul>	<ul style="list-style-type: none"> <li>Local shops</li> <li>Tram service</li> <li>GMB service</li> </ul>	<ul style="list-style-type: none"> <li>Local shops</li> <li>Car-park egress and taxi stand at Russell Street</li> </ul>
<b>Conclusion</b>	Less attractive route with more significant traffic impact and disruption to tram service during construction.	Attractive route with less significant traffic impact during construction.	Not attractive route with significant traffic impact and disruption to tram and GMB services during construction.	Less attractive route with significant traffic impact and engineering constraints during construction.

- 3.1.3 Having examined the major issues and constraints as tabulated in **Table 3.2**, the optimum subway alignment is determined taking into account the pedestrian flow, attractiveness to pedestrians, construction/engineering constraints, traffic impact and possible public nuisance during construction. The preliminary recommended subway alignment connects Victoria Park and Happy Valley through the central Causeway Bay area via Great George Street, Hennessy Road, Jardine's Crescent, Kai Chiu Road, Russell Street (Times Square), Matheson Street to the vicinity of Happy Valley (i.e. Option B).
- 3.1.4 Having regard to the usable underground area and the space to allow for the construction works, about 6m clear width is generally adopted for the subway section between Victoria Park and Russell Street (Times Square), except the two short sections of only about 4m clear width outside Lin Fook House and at the junction of Kai Chiu Road and Lee Garden Road. Subject to further investigation on the underground condition in the next stages of the project, these two subway sections should be made wider where practicable. As for the subway section along Matheson Street, the maximum clear width of the subway according to this desktop study can only be about 3m owing to the constraint imposed by the adjacent old buildings. With only half of the width of the rest of the proposed subway that could lead to possible serious crowdedness, it is initially recommended that the construction of this section be held in abeyance pending redevelopment of the old buildings along the road to provide the necessary setback for construction of a 6m-wide subway. For the remaining section running further south to reach the vicinity of Happy Valley, the pedestrian demand is forecast to be fairly low and therefore the need, alignment and extension of this subway section should be reviewed when there is a more definite programme for construction of the Matheson Street section in future.
- 3.1.5 The above findings were presented to the DPTC of the WDC, the Legislative Council Panel on Transport (LegCo TP) and the Transport Advisory Committee (TAC) in December 2009, January and February 2010 respectively. In view of the concerns raised at the above meetings that the redevelopment of the buildings along Matheson Street might take years to materialise, it is recommended that the implementation arrangement for the following sections of the subway should be studied further in the next stage:-
- (i) Section 1: Victoria Park to Russell Street (near Times Square) – to be constructed first.
  - (ii) Section 2: Matheson Street - to facilitate early construction of this section, it is worthwhile to review first the maximum width of the subway that can be constructed and to examine the feasibility of phased construction of this section with final widening to 6m. If the above options are not viable, then the fallback options via Percival Street (i.e. Option A) and via Canal Road East (i.e. Option D) should be revisited.
  - (iii) Section 3: South of Leighton Road / Wong Nai Chung Road to the vicinity of Happy Valley - Though the need for extension to the south of Leighton Road along Wong Nai Chung Road is to be reviewed in future, it is recommended to investigate the feasibility of another alignment option along Leighton Road, which is a shorter and more direct pedestrian route connecting to the existing subway at Sports Road. The pros and cons of this option should be studied in the next stage of the project.
- 3.1.6 The preliminary subway layout with implementation arrangement is shown in **Drawing No. 3.2**. Lifts and escalators will be provided at appropriate entrances/exits for barrier-free access.



### **3.2 Connectivity**

- 3.2.1 To enhance utilisation and boost commercial vibrancy, the subway will connect with the Causeway Bay MTR Station and possibly large shopping malls along the way as well. Initially, two connection points to the Station are identified at locations underneath (i) Great George Street outside the Island Beverly and (ii) Jardine's Crescent outside the Goldmark, while the connections to the shopping malls will be subject to the developers' initiatives and their application to the government for its construction on their own, so as to allow pedestrians/customers gaining access conveniently to their shopping centres. Connections with Windsor House, Times Square, Hennessy Centre (under redevelopment), Lee Theatre Plaza and Leighton Centre appear technically feasible.

### **3.3 Facilities and Beautification Schemes**

- 3.3.1 Air-conditioning system should be provided in the subway to enhance pedestrian comfort so as to improve its attractiveness. Moreover, adequate surveillance system such as Closed Circuit Television is recommended to enhance pedestrian safety. In view of the anticipated lower pedestrian demand after midnight, the subway may be closed afterwards and its opening hours can possibly tie in with the operating hours of the MTR station. This can effectively minimise security concern and also achieve the cost-effectiveness in operating the subway.
- 3.3.2 The provision of travelators is not recommended in view of the confined width (6m) of the subway and the meandering subway alignment, not only because it will reduce the effective walkway width but also it will restrain the possibility for future subway connection with the adjacent premises.
- 3.3.3 Conceptual beautification schemes, without occupying significant subway internal space, include internal façade design such as photos showing the local characters over perforated metal or tiles along the wall structure or wall-painting to enrich walking experience, installing different feature lightings to achieve an aesthetically pleasant environment for both the daytime and nighttime, adopting glass materials for the entrance canopy to improve internal lighting, and integrating greening and tree planting to optimize pedestrian comfort at the open space for the street entrance at Victoria Park. Other than the beautification schemes, it is preliminarily identified that mini-shops, advertising panels and automatic vending machines could possibly be provided at some spare spaces within the subway. If these commercial elements of the subway were to be pursued, a preliminary financial assessment indicated that the revenue generated might contribute significantly to cover the recurrent costs of running the subway. However, this needs to be further reviewed and ascertained in the light of the prevailing market condition and also the availability of more concrete information at the later stage of the project.
- 3.3.4 In view of the complexity of various facilities as mentioned above, the successful implementation of this subway system will hinge on maintaining attractiveness for pedestrian use. Provision of a high standard of management and maintenance services of the subway system, including the ventilation and security system, electrical and mechanical (E&M) facilities, commercial items as well as the cleanliness of the subway, is therefore essential. To this end, a special dedicated team should be established, possibly by way of contracting out, or the government may invite interested parties such as the private sector to manage and maintain the portion of the subway adjacent to the connection area to their developments. These suggestions should be subject to further consideration and review in the detailed design stage of the project.

### **3.4 Pedestrian Forecast in Subway**

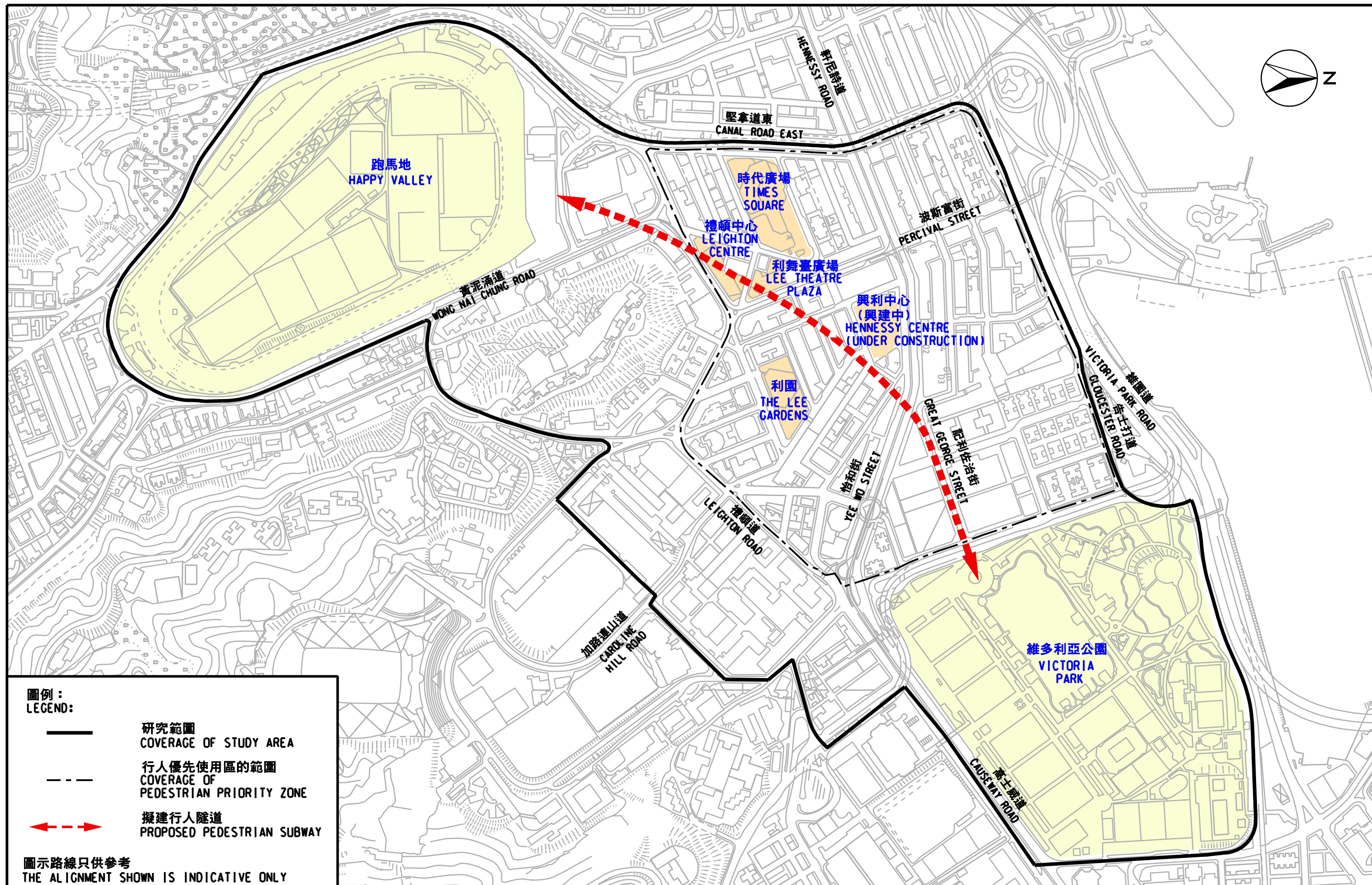
- 3.4.1 It is expected that during peak periods of normal days, the proposed subway system will carry about 7,000 ped/hr at the most critical subway section along Kai Chiu Road corridor in the year 2026, which is about one-third of the projected at-grade demand.
- 3.4.2 With the proposed subway system, it is expected that the majority of pedestrians to/from Victoria Park will use the subway to the central Causeway Bay area (including the MTR station and the key activity nodes), thus improving the general at-grade pedestrian condition at these critical walkway sections, especially during event held in Victoria Park.

### **3.5 Issues to be Further Examined**

- 3.5.1 There are some engineering considerations that should be examined and considered carefully in the next stage, including:
- (i) environmental consideration during construction and operation stages such as procedures in compliance with the Environmental Impact Assessment Ordinance;
  - (ii) old and valuable tree consideration, if any;
  - (iii) geotechnical consideration, for example, groundwater drawdown or ground movement towards the excavation may cause movement in old buildings;
  - (iv) drainage consideration such as flooding control;
  - (v) E&M consideration such as services required for operation of the proposed subway system including air-conditioning system, environmental control system, electrical systems, fire services, plumbing and drainage systems;
  - (vi) heritage consideration, if any, in compliance with the heritage impact assessment; and
  - (vii) others, such as statutory and land acquisition procedures.

### **3.6 Further Study and Consultation**

- 3.6.1 Although preliminary subway alignments have been recommended, given the nature of this Study is of preliminary feasibility only, detailed engineering investigation should be carried out and the final subway alignment should therefore be determined according to the findings from further engineering feasibility study and consultations as appropriate to be conducted in the next stage of the project.



**AECOM**

TD 181/2008 銅鑼灣區行人隧道及相關交通改善措施研究  
 TD 181/2008 STUDY ON PEDESTRIAN SUBWAYS AND RELATED TRAFFIC IMPROVEMENT MEASURES IN CAUSEWAY BAY  
**研究範圍**  
**STUDY AREA**

SCALE

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DRAWING No.

2.1

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