立法會PWSC157/18-19(01)號文件

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本局檔號 OUR REF .:

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香港中區立法會道一號 立法會綜合大樓 立法會財務委員會 工務小組委員會秘書 盧慧欣女士

盧女士:

立法會工務小組委員會 2019 年 2 月 13 日會議 863TH 號工程計劃— 蓮麻坑路西段(平原河至坪輋路)擴闊工程

在 2019 年 2 月 13 日的立法會工務小組委員會會議 上,委員在審議 863TH 號工程計劃—蓮麻坑路西段(平原河 至坪輋路)擴闊工程(下稱「本工程項目」)的撥款申請時,要 求政府就(一)本工程項目的相關交通流量評估方法;(二)蓮麻 坑路西段附近道路於進行交通統計當日各個時段的車流量 分布數據;(三)其他同樣涉及在北區邊境禁區進行類似道路 擴闊工程的所需費用;及(四)將會受本工程項目影響的兩棵 珍貴樹木的所在位置提供補充資料。本局在徵詢運輸署及路 政署的意見後,現綜合回覆如下:

1

(一)本工程項目的相關交通流量評估的方法

 視乎工程項目的規模及性質,交通影響評估可以採用 較複雜的交通電腦模型方法或較直接的增長率方法。鑑於本 工程項目主要是擴闊現時約750米長的單線雙程道路至雙線 雙程道路,所以顧問公司採用了增長率方法。增長率方法的 交通流量評估主要以進行評估時的交通統計車流量為基礎 數據、評估年份期間預計每年的車流量增長,及往返鄰近相 關的新發展項目的預計車流等各項因素而作出估算。

3. 就本工程項目而言,顧問公司首先按於基準年份,即 2017年,在有關路段進行的交通統計所得的數據,扣除部分 屬臨時性質的車流(例如蓮塘/香園圍口岸項目的工程車輛) 作為基礎車流,再參考過往的交通記錄,以估算該路段每年 的交通自然增長率為 0.6%,從而計算出本工程項目的預計落 成年份(約為 2023 年)及可反映項目中長期交通表現的年份 (約為 2032年)之間的交通自然增長。

4. 評估當中已考慮評估年份期間已知悉並較確實的發展項目,包括現有附近的鄉村人口增長、接近完成的蓮塘/ 香園圍口岸項目、正在施工的沙嶺墳場骨灰安置所和未來在該區的規劃發展項目。另外,在評估年份期間往返附近建築地盤的工程車輛所造成的短期車流亦為考慮因素之一。詳細評估方法請參閱<u>附件一</u>的交通流量評估報告(只有英文版本)。

5. 根據交通流量評估報告,有關路段預計於 2023 年及 2032 年的雙向車流分別約為每小時 700 及 840 小客車單位 (pcu)¹。如本工程項目未能如期動工並在 2023 年落成,該路 段在 2023 年及 2032 年的行車量/容車量比率 ²將分別達至 1.18 及 1.39,表示該段單線雙程道路會越趨擠塞。相反,若 本工程項目能如期動工並在 2023 年落成,該路段在 2023 年 及 2032 年的行車量/容車量比率將分別降至 0.48 及 0.56。

¹ 小客車單位是計算相等於私家車數目的交通流量單位。舉例而言,私家車和的士的小客車單 位定為1.0,輕型貨車的小客車單位定為1.5,而通常以較低速度行駛的重型車輛,如重型貨 車或巴士,其小客車單位則較高。

² 行車量/容車量比率若相等或低於 1.0 為可以接受。行車量/容車量比率在 1.0 至 1.2 之間則 表示擠塞情況仍受到控制。行車量/容車量比率大於 1.2 時,表示交通擠塞較為嚴重。

<u>(二)附近道路於進行交通統計當日各個時段的車流量分布數</u> 據

6. 本工程項目的工程顧問參考了蓮麻坑路西段附近道路過往的交通統計周年報告中各個時段的車流量分布數據後,分別於2017年7月某星期其中三天的繁忙時段(分別為星期五的上午7至10時及下午5至8時、星期六和星期日的上午10時至下午4時),在蓮麻坑路西段及附近的坪輋路進行了交通統計,以統計有關路段在平日及週末的最高交通流量。有關的交通統計行車流量圖表載於<u>附件二(只有英文版本)。</u>

(三)其他同樣涉及在北區邊境禁區進行的類似道路擴闊工程的所需費用

7. 根據運輸署的紀錄,本工程項目附近同樣涉及於北區邊境禁區進行的道路擴闊工程只有一項,為土木工程拓展署 推展的816CL號工程計劃「沙嶺墳場興建骨灰安置所的土地 平整及相關基礎設施工程」項目。有關工程項目的主要細節 和涉及的道路工程費用如下:

工程計劃項目及項 目內的相關道路工 程內容	工程計劃項目 費用 (按 2018 年 9 月價格計算)	相關道路工程費 用 (按 2018 年 9 月價格計算)
863TH 號工程計劃 (本工程項目) 擴闊一段長約750米 的蓮麻坑路,由現有 約3.5米闊的單線道 路重建和擴闊至7.3 米闊的行車道連行	3 億 5,980 萬元 ¹	3,810 萬 元

¹本工程項目的立法會工務小組委員會討論文件中所載的費用為按付款當日價格計算。有關費用需要先調整至2018年9月價格,以在相同價格水平上與其他工程項目作參考。

	工程計劃項目	相關道路工程費
工程計劃項目及項	費 用	用
目內的相關道路工	(按 2018 年	(按 2018 年
程內容	9月價格計算)	9月價格計算)
人路		
<u>816CL 號工程計劃⁴</u>		
擴闊現有一段介乎 文錦渡路和平原河 之間的蓮麻坑路(約 1.4 公里長)和現有一 段沙嶺道(約 800 米 長)至7.3 米闊的行車 道連行人路。	16 億 3,800 萬 元 ³	2 億 3,410 萬 元 ⁴

8. 鑑於每項工程項目均有其獨特性,而每項道路擴闊工程的推展年份、工地位置、地理條件、交通情況、規模、採用的設計及物料等因素亦有差別,因此,上述道路擴闊工程費用只能作參考。若單從造價方面與其他項目作比較,其實際意義並不大。

² 有關工程計劃範圍及性質主要包括:(a)在沙嶺墳場平整約 1.8 公頃的土地, 以供建造骨灰安置所及上落客區;(b)擴闊現有一段沙嶺道(約 800 米長)至 7.3 米闆的行車道連行人路;(c)在沙嶺道與文錦渡路交界處附近興建上落客點; (d)擴闊現有一段蓮麻坑路(約 1.4 公里長)至 7.3 米闆的行車道連行人路;以 及(e)進行相關的基建工程,包括道路工程、水務工程、渠務及污水排放工程、 土力工程、環境美化工程及緩解環境影響措施,以及其他附屬工程。

³ 根據工程計劃項目提交財務委員會的討論文件,工程計劃項目費用(按 2017 年9月價格計算)為 15億7,500 萬元。經調整後工程計劃項目費用(按 2018 年9月價格計算)為 16億3,800 萬元。

⁴ 根據工程計劃項目提交財務委員會的討論文件,工程計劃項目有關道路工程 的費用(按 2017 年 9 月價格計算)為 2 億 2,510 萬元。經調整後有關費用(按 2018 年 9 月價格計算)為 2 億 3,410 萬元。

(四) 將會受本工程項目影響的兩棵珍貴樹木的所在位置

9. 將受擬議工程影響的兩棵珍貴樹木的詳細位置載於 <u>附件三</u>。

運輸及房屋局局長

(陳凱庭 凱陳 代行)

- 2019年3月26日
- 副本抄送:
- 路政署署長 (經辦人:黎國輝先生) (傳真:2714 5289)
- 運輸署署長 (經辨人:葉冠強先生) (傳真:2381 3799)

附件一 Annex 1

Highways Department

Agreement No. CE 51/2013 (HY) Widening of Western Section and Eastern Section of Lin Ma Hang Road – Design and Construction

Note of Traffic Forecast Review (Western Section)

235694-REP-102-02

March 2019

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 235694

Ove Arup & Partners Hong Kong Ltd Level 5 Festival Walk 80 Tat Chee Avenue Kowloon Tong Kowloon Hong Kong www.arup.com

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1 Introduction

1.1 Project Background

- 1.1.1 The frontier closed area (FCA) is an integral part of the package of coordinated tactics for effective boundary control. To reduce the FCA to the minimum necessary for ensuring public order, the Government substantially reduced the land coverage of the FCA from about 2,800 hectares at the time to about 400 hectares via a three-stage reduction exercise carried out from 2008 to 2016, thereby releasing 2,400 hectares of land for various uses.
- 1.1.2 To formulate a planning framework to guide the conservation and development of the large area to be released from the FCA, Planning Department (PlanD) commenced a consultancy study "Land Use Planning for Closed Area Feasibility Study" to examine the development potential and constraints of the area. As identified in that study, the existing road configuration of Lin Ma Hang (LMH) Road, which is basically a 3.5m-wide single-track access road with passing bays, would not be able to cope with the anticipated traffic flow upon opening of the relevant portion of the FCA. Regarding landuse zoning, the study recommended "Recreation" and "Village Type Development" zones as major landuses for the area near Ping Che Road, while "Green Belt", "Agriculture", "Recreation" and "Village Type Development" zones were suggested for the area along LMH Road between Pak Fu Shan and Wang Lek.
- 1.1.3 The existing LMH Road stems from Man Kam To Road near the Boundary Control Point at the west. It meanders towards the east at a short distance from Sham Chun River. After passing through Ping Che Road and Lin Ma Hang, it terminates at Sha Tau Kok at the east. Along the road is rural environment with scattered villages. Structure-wise, LMH Road is basically a 3.5m wide single-track access road with passing bays except the section between Man Kam To Road and Ping Yuen River, which is a single two-lane road of a 6.5m wide carriageway with footpath on one side.
- 1.1.4 To cater for the anticipated traffic growth of Lin Ma Hang Road due to the opening up of the FCA, and provide a safer and more efficient road network for local villagers and visitors, improvements to the road are needed. Transport Department (TD) recommended the "Western Section" between Ping Yuen River and Ping Che Road, and "Eastern Section" between Tsung Yuen Ha and Lin Ma Hang, be widened to a 7.3m wide single two-lane carriageway with 2m wide footpath on both sides of the carriageway to meet the current standards. The widening works of Lin Ma Hang Road between Ping Che Road and Tsung Yuen Ha is taken up by Civil Engineering and Development Department (CEDD) under the Liantang / Heung Yuen Wai Boundary Control Point project.
- 1.1.5 An investigation study for this Project (under Agreement No. CE5/2012 (HY)) was commenced in August 2012, including environmental review and preliminary design of the road widening works for the Western and Eastern Sections.
- 1.1.6 On 19 March 2014, Highways Department (HyD) commissioned Ove Arup & Partners Hong Kong Ltd as the Consultant to undertake the "Agreement No. CE 51/2013 (HY) Widening of Western Section and Eastern Section of Lin Ma Hang Road Design and Construction". The main tasks of this assignment are to review the findings of the previous feasibility study, to prepare detailed design and tender and contract documents, and to supervise the construction works.

1.2 Objective of this Note

1.2.1 The 3rd Stage of FCA reduction took effect on 4 January 2016. Highways Department instructed Arup to conduct traffic survey to review the latest traffic condition of the Western Section of LMH Road. The traffic survey was carried out in July 2017. This Note covers the results of this traffic survey 2017, and the subsequent review of the link capacity and traffic forecast in 2023 and 2032.

2 Traffic Survey

2.1 Dates, Time & Location of Survey

- 2.1.1 To determine the survey periods, the nearest counting station to LMH Road Western Section as published in TD's Annual Traffic Census as well as the previous traffic survey had been referred. Based on the reference counting station, the morning and evening peaks of the roads in the area would be within 07:00 10:00 & 17:00 20:00 (weekdays) and 10:00 16:00 (weekends). The peak flow will be in Fridays.
- 2.1.2 The traffic survey was conducted on the following dates in July 2017 covering both normal weekday and weekends at Western Section of LMH Road.

Date	Time
14 July 2017 (Fri)	07:00-10:00 & 17:00-20:00
15 July 2017 (Sat)	10:00-16:00
16 July 2017 (Sun)	10:00-16:00

2.2 Result of Traffic Survey

2.2.1 On 14 July 2017 (Fri), the morning and evening peak hours were found to be 07:30-08:30 and 17:15-18:15 respectively. The summary of the traffic survey results is illustrated in the below figure.



3 Traffic Forecast and Link Capacity Assessment

3.1 Traffic Forecast Methodology

3.1.1 In general, growth factor methodology could be adopted for relatively simple cases by using the historical growth information, and supplemented with well-defined development parameters. As stated in Section 1.3.1, the 3rd Stage of FCA reduction took effect on 4 January 2016, the local traffic pattern has been redistributed and stabilized at the time when the traffic survey was conducted in July 2017. In view of the small scale of the proposed road widening work and there is no major road work in the future which would induce significant change of the local traffic pattern, the growth factor methodology is considered applicable to forecast the traffic flows at the subject road. Traffic flows forecast adopted in this assessment are primarily based on the traffic survey conducted in July 2017. A suitable growth factor by making reference to historical data of the Annual Traffic Census is then applied to these survey results to obtain the design year traffic flows. There are planned/committed developments in the vicinity of the Western Section of LMH Road, including the columbarium at Sandy Ridge, village expansion and organic farm. Their induced traffic demand will be added to the traffic flows forecast.

3.2 Volume/Capacity Ratio

3.2.1 The Volume to Capacity (V/C) ratio indicates the proportion of the road capacity being used by the peak hour traffic flow. Higher V/C ratio of a road indicates heavier usage of the road link concerned. A V/C ratio equals to or less than 1.0 is considered acceptable. A V/C ratio between 1.0 and 1.2 indicates a manageable degree of congestion. A V/C ratio above 1.2 indicates more serious congestion.

3.3 Design Capacity of the Existing Lin Ma Hang Road

3.3.1 Taking into account the current configuration of the subject LMH Road, its design capacity is estimated to be 600PCU/hr¹.

3.4 Traffic Survey

3.4.1 Based on the traffic survey conducted in 2017 at Western Section of LMH Road, the breakdown of vehicle type and highest traffic flow observed during AM peak and PM peak hours are summarized as follows.

	2017 Vehicle Type (PCU/hr) AM Peak: 07:30-08:30				2017 Vehicle Type (PCU/hr) PM Peak: 17:15-18:15					
	Private Vehicle	Light Goods Vehicle	Medium/Heavy Goods Vehicle (M/HGV)	Public Transport	Total	Private Vehicle	Light Goods Vehicle	Medium/Heavy Goods Vehicle (M/HGV)	Public Transport	Total
EB	202	61	190	9	462	106	42	163	6	317
WB	105	31	58	6	200	136	38	145	8	327
	Sum				662				Sum	644
	Volume/Capacity Ratio			1.10	Volume/Capacity Ratio			1.07		

¹ Design capacity of single track access road: 120 PCU/hr. Design capacity of single-two lane local roads: 1000 PCU/hr. Length of passing bays = 400m. Resulting design capacity = 1000 PCU/hr x (400/750) + 120 x (350/750) \approx 600 PCU/hr.

3.5 Traffic Forecast for Year 2023 and Year 2032

Scenario before Road Widening

- 3.5.1 662 PCU/hr is adopted as the background traffic flow to forecast the traffic flows. To exclude the influence arising from the construction of Liantang/Heung Yuen Wai BCP and associated projects, the related construction traffic of about 60 PCU/hr is excluded in the future traffic forecast. Hence the background traffic flow of Western Section of LMH Road will be $662 60 \approx 600$ PCU/hr.
- 3.5.2 The estimated traffic flows in Year 2023 and Year 2032 are calculated as follows:

	Critical AM Peak: 07:30-08:30			
Source of Traffic Flow	Predicted Traffic Flow (PCU/hr) in Year 2023	Predicted Traffic Flow (PCU/hr) in Year 2032		
Traffic growth rate ¹	$600 \ge (1+0.6\%)^{6} = 622$	$600 \text{ x } (1+0.6\%)^{^{15}} = 656$		
Construction traffic ²	15	0		
Sandy Ridge Cemetery ³	0	82		
Traffic induced from organic farms ⁴	10	10		
Traffic induced from village ⁵	59	88		
Sum	706	836		
Volume/Capacity Ratio	706/600 = 1.18	836/600 = 1.39		

Notes:

- 1. A steady traffic flow growth rate of 0.6% per annum is adopted according to historical data of the nearest ATC station no. 5860 Sha Tau Kok Road.
- 2. The peak construction traffic is estimated to be 15 PCU/hr, induced by the works before commissioning of this road widening in Year 2023.
- 3. Reference: TIA Report for columbarium project at Sandy Ridge.
- 4. Reference: The explanatory statement of approved Man Kam To Outline Zoning Plan (No. S/NE-MKT/4)
- 5. Reference: Based on the explanatory statement of approved Man Kam To Outline Zoning Plan (No. S/NE-MKT/4), the planned population will be about 6,660 persons. Based on the 2011 Population Census, the population of the area was estimated about 600 persons. Hence, there would be population increase of 6,060 persons in the vicinity from 2011 to 2026.

The population increase from 2011 to 2017 would be $6,060 \ge 6/15 = 2,424$. Therefore, the population increase from 2017 to 2026 is 3,636.

By adopting the trip rate of 0.073 PCU/hr/flat (i.e. observed by trip generation survey at existing villages) and 3 persons/flat, the village expansion will generate additional traffic of $3,636 / 3 \ge 0.073 = 88$ PCU/hr, by and after 2026.

Based on the estimated traffic flow of 88 PCU/hr due to village expansion by 2026, interpolation (from 2017 to 2023) is adopted to estimate the traffic flow in 2023, i.e. $88 \times 6 / 9 = 59$ PCU/hr.

Scenario after Road Widening

3.5.3 462 PCU/hr and 200 PCU/hr, of LMH Road eastbound and westbound respectively, are adopted as the background traffic flow to review the traffic forecast. To exclude the influence arising from the construction Liantang/ Heung Yuen Wai BCP and associated projects, the related construction traffic of about 45 PCU/hr and 15 PCU/hr eastbound and westbound respectively, are excluded in the future traffic forecast. Hence the background traffic flow of Western Section of LMH Road eastbound will be 462 - 45 \approx 415 PCU/hr, while the background traffic flow of Western Section of LMH Road westbound will be 200 - 15 \approx 185 PCU/hr. The estimated traffic flows in Year 2023 and Year 2032 are calculated as follows:

	Critical AM Peak: 07:30-08:30						
Source of Traffic Flow	Predicted Eastbound Traffic Flow (PCU/hr) in Year 2023	Predicted Westbound Traffic Flow (PCU/hr) in Year 2023	Predicted Eastbound Traffic Flow (PCU/hr) in Year 2032	Predicted Westbound Traffic Flow (PCU/hr) in Year 2032			
Traffic growth ¹	$ \begin{array}{r} 415 \text{ x} \\ (1+0.6\%)^{6} = \\ 430 \end{array} $	$185 x (1+0.6\%)^{6} = 192$	$ \begin{array}{r} 415 \text{ x} \\ (1+0.6\%)^{^{15}} = \\ 454 \end{array} $	$185 x (1+0.6\%)^{^{15}} = 202$			
Construction traffic ²	0	0	0	0			
Sandy Ridge Cemetery ³	0	0	41	41			
Traffic induced from organic farm ⁴	5	5	5	5			
Traffic induced from village expansion ⁵	59 x (415/600) = 41	59 x (185/600) = 18	88 x (415/600) = 61	88 x (185/600) = 27			
Sum	476	215	561	275			
Volume/Capacity Ratio	476/1000 = 0.48	215/1000 = 0.22	561/1000 = 0.56	275/1000 = 0.28			

Notes:

- A steady traffic flow growth rate of 0.6% per annum is adopted according to historical data of the nearest ATC station no. 5860 Sha Tau Kok Road.
- 2. The road widening would be completed, thus nil construction traffic would be added.
- 3. Reference: TIA Report for columbarium project at Sandy Ridge.
- 4. Reference: The explanatory statement of approved Man Kam To Outline Zoning Plan (No. S/NE-MKT/4).

5. Reference: Based on the explanatory statement of approved Man Kam To Outline Zoning Plan (No. S/NE-MKT/4), the planned population will be about 6,660 persons. Based on the 2011 Population Census, the population of the area was estimated about 600 persons. Hence, there would be population increase of 6,060 persons in the vicinity from 2011 to 2026.

The population increase from 2011 to 2017 would be $6,060 \ge 6/15 = 2,424$. Therefore, the population increase from 2017 to 2026 is 3,636.

By adopting the trip rate of 0.073 PCU/hr/flat (i.e. observed by trip generation survey at existing villages) and 3 persons/flat, the village expansion will generate additional traffic of $3,636 / 3 \ge 0.073 = 88$ pcu/hr, by and after 2026.

Based on the estimated traffic flow of 88 PCU/hr due to village expansion by 2026, interpolation (from 2017 to 2023) is adopted to estimate the traffic flow in 2023, i.e. $88 \times 6 / 9 = 59$ PCU/hr.

Directional factor of 415/600 for Eastbound and 185/600 for Westbound are adopted based on Year 2017 background traffic.

4 Conclusion

- 4.1.1 At present, the V/C ratio of the concerned single-lane road with passing bays has reached 1.10, indicating that traffic congestion will occur during peak hours. The situation is undesirable for the concerned single-lane road for two-way traffic causing delays to the traffic. With the increase of the traffic over years, traffic congestion will become more serious.
- 4.1.2 Therefore, widening of the aforementioned Western Section of LMH Road is required to relieve the current traffic congestion as well as to cope with the anticipated traffic growth, improve safety to road users by offering proper 2m-wide footpaths, provide road drainage system for proper discharge, and enhance aesthetic appeal of the surrounding environment along LMH Road.
- 4.1.3 Upon completion of the project, it is anticipated that the V/C ratios of the concerned road during the critical AM peak hour will be improved as follows:

Voor	Volume/Capacity (V/C) Ratio				
i cai	Before Road Widening	After Road Widening			
2017	1.10	-			
2023	1.18	0.48			
2032	1.39	0.56			

附件二 ANNEX 2













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附件三

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ANNEX 3